

2019-2020

Sports
Medicine



ATHLETIC TRAINING

POLICIES AND PROCEDURES



CoxHealth Sports Medicine Mission and Vision Statements

MISSION

To improve the performance and enhance the quality of life for athletes of all ages and skill levels by promoting injury prevention, sport-specific training advice, comprehensive education, effective communication and personalized care. We are committed to providing our customers with easy access to the skillful diagnosis, treatment and rehabilitation of sports-related injuries and conditions.

VISION

To be recognized as the leading Sports Medicine program in the Midwest through consistent delivery of high quality services.

CoxHealth Sports Medicine policies and procedures have been reviewed and approved by the following physicians providing oversight of the functional protocol for State of Missouri licensure of the Athletic Trainers in their respective areas:

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2019-2020

Sports Medicine Policies and Procedures

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Automated External Defibrillator (AED)

Automated External Defibrillator (AED) Policy

Policy

Each full time Athletic Trainer (AT), performing outreach healthcare services within the CoxHealth Sports Medicine program, shall be equipped with a ZOLL AED Plus unit. It is the responsibility of the AT to make sure that the AED unit in their possession is properly functioning, and is available for any emergent need.

Storage

All AEDs will be stored in an appropriate case/bag, and will be easily accessible in the event of an emergency.

Associated Equipment

One set of AED pads are to be connected to the AED at all times. If a spare set of pads are available, they shall be kept in the AED case/bag. A small rescue kit, consisting of a disposable razor, trauma shears, a washcloth or small towel, and a pocket facemask or other barrier device, shall be stored with the AED.

Monthly Maintenance Check

Once each calendar month, the AT shall conduct, and document a system check (see Appendix I). This monthly check shall include a review of the following elements:

- Rescue kit supplies
- AED battery OK
- AED operation and status
- Pad expiration date(s)

Annual Maintenance Check

Once each calendar year, the AED shall be inspected by the CoxHealth Bio-Med department.

Education

Basic Life Support (BLS) certification from the American Heart Association, consisting of the most current standards, is required for all Athletic Trainers performing outreach healthcare services.

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Automated External Defibrillator (AED) (continued)

Automated External Defibrillator (AED) Procedures

Procedures

Conduct an Initial Assessment

- Assess scene for safety; Use Universal Precautions
- Assess patient for unresponsiveness
- If unresponsive, call 911 or send someone to call 911
- Send someone for the AED

Treatment

- Begin Basic Life Support (BLS) Cardiopulmonary Resuscitation (CPR) per most current American Heart Association (AHA) standards until AED arrives
- As soon as AED arrives:
- Turn on AED and follow prompts. If patient is an infant or child, use Infant/Child defibrillator pads if available
- Cut or tear away clothing covering chest
- Shave excessive chest hair with disposable razor, if indicated
- If medication patch is present, and located where pads are to be placed, remove it and discard
- Dry the chest, if wet, and/or move patient to a dry area if lying in water
- Apply defibrillation pad(s) as illustrated on machine and/or pad packaging
- Follow AED prompts until EMS personnel arrive, and assume responsibility for patient care
- When EMS assumes responsibility of patient care:
- Individuals working on the patient should document and communicate important information to the EMS providers, such as:
- Patient's name
- Any known medical problems, allergies, and/or medical history

- Time the patient was found and/or time of collapse
- Initial and current condition of patient
- Number of shocks delivered and any other treatment given
- Assist, as requested, EMS providers
- Post Event Procedures
- Remove AED unit from service, and notify the appropriate CoxHealth Sports Medicine Administrator, and CoxHealth Sports Medicine Medical Director that the event has occurred
- Assist appropriate CoxHealth Sports Medicine Administrator in completing the Report of Defibrillator Use form, and fax to appropriate EMS Service, if applicable.
- Restock electrode pads, batteries and rescue kit supplies.
- Return AED to service
- Following each use of an AED, a review shall be conducted to learn from the experience. All key participants in the event shall participate in the review. Included in the review shall be identification of actions that went well, and the collection of opportunities for improvement, as well as stress debriefing.

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Cervical Spine Injuries

Cervical Spine Injuries Policy

Policy

- Any patient suspected of having a spinal injury will be managed as though a spinal injury exists.
- If a spinal injury is suspected, activation of EMS through calling 911 and the Standard Emergency Action Plan will occur.
- Equipment will only be removed for non-cardiac/respiratory emergencies, if at least four trained individuals/rescuers are present.
- All individuals responsible for the care of patients will be involved in an annual rehearsal of the emergency action plan, as well as training and practice in the special skills inherent to managing a cervical spine injury.
- A spinal immobilization kit should contain all necessary packaging supplies: head-immobilization system (manual immobilization or neck towel rolls and 2 point taping) , face-mask-removal tools, and straps to secure the patient to the board, wrist straps to secure the patient's hands together, tape, and various sizes of padding or towels. (Spine board/gurney on the ambulance or provided by school system).

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Cervical Spine Injuries Procedure

Procedure

Any patient suspected of having a spinal injury should be managed as though a spinal injury exists.

During initial assessment, the presence of any of the following findings, alone or in combination, heightens the suspicion for a potentially catastrophic cervical spine injury and requires the initiation of the spine injury management protocol: unconsciousness or decreased level of consciousness, bilateral neurologic findings and/or upper and lower extremity neurologic finding or complaints, significant midline spine pain with or without palpation, and obvious spinal column deformity.¹

- When a potential spine injury is suspected EMS should be alerted. Rescuers should ensure that the cervical spine is in a neutral position and should immediately apply manual cervical spine stabilization. Airway, breathing and circulation will then be assessed. All subsequent steps assume ABC's are suitable for survival. If they are not, proceeding down the path of CPR will commence as priority.
 - If the patient must be moved to maintain airway, breathing, and circulation, the patient should be placed in a supine position while maintaining spinal immobilization.
 - Movement restriction of the head and the cervical spine should be continued until a destabilizing injury has been ruled out using appropriate diagnostic testing (imaging).
- Prone Protocol
 - Log-roll method is the only transfer method for a patient who is prone.¹
 - Requires 4-5 rescuers
 - To facilitate transfer, carefully move arms to sides, legs straightened and together.

Cervical Spine Injuries (continued)

- Rescuers should inspect the spine prior to movement.
- Rescuers should not apply traction to the cervical spine.

Check Airway, Breathing, and Circulation (ABCs), neurological status, and level of consciousness.

- Rescuers should immediately attempt to expose the airway, removing any existing barriers.¹
- Facemask removal
 - The face mask should be removed with the tool and technique that performs the task quickly and with minimal movement and difficulty.¹
 - A power cordless screwdriver and quick release is recommended to reduce head movement. A backup cutting tool should be available that matches the needs for the given equipment.¹
- If the face mask cannot be removed in a reasonable amount of time, then the helmet should be removed from the patient in the safest manner possible. A neutral cervical spine position should be preserved during and after this process by removing additional pieces of equipment.

If rescue breathing becomes necessary, the individual with the most training and experience should establish an airway and commence rescue breathing using the safest technique.¹

- During airway management, rescuers should cause as little motion as possible.¹
 - The jaw-thrust maneuver is recommended over the head-tilt technique.
 - Advanced airway management techniques are recommended in the presence of appropriately trained and certified rescuers
- Activate EMS (Call 911)/CoxHealth Standard Emergency Action Plan
- Equipment removal.

- Removal of athletic equipment is deferred until the patient has been moved to a supine position and requires a minimum of 4 trained healthcare professionals.
- Prepare equipment to be removed
 - The jersey and strings should be cut in a T-formation in a direction away from the head.
 - Chest/shoulder pad strings and buckles should be cut or disconnected.
 - Helmet strapping should be cut.
 - Cheek pads should be removed from helmets using a thin, rigid object to detach snaps if applicable.
 - Helmet air bladders drained if necessary.
- Football Equipment Removal process
 - Cervical spine stabilization is transferred from the rescuer at the head to another rescuer, who assumes cervical spine control from the front.
 - The rescuer assuming cervical spine control guides the additional rescuers on each side to lift patient by the thoracic spine slightly off the ground.
 - The rescuer that had been at the head grasps the helmet at the sides and gently removes the helmet from the patient.
 - The rescuer at the head then carefully removes the chest/shoulder pads by sliding them out from underneath the patient.
 - The rescuer assuming cervical spine control will guide the additional rescuers on each side to lower patient back to the surface.
 - Once the helmet & shoulder pads are removed, manual stabilization is transferred back to rescuer at the head.
- Non-football Sports
 - Softball/baseball catching gear
 - Chest protector straps can be cut and protector pulled away from body.

- Cut bottom straps on each side of catcher helmet.
- Remove catcher helmet the same as referenced above for football.
- Softball/Baseball batting helmets are removed in the same manner as with football helmet referenced above, with the exception of non-removable cheek pads.
- Transfer of patient to immobilization device
 - The 8-plus-person lift is the preferred method if enough individuals are present
 - Straddle lift-and-slide as well as log roll methods are appropriate if 4 or fewer rescuers are present.
 - If it is necessary to reposition the patient once on the device, do not move in a perpendicular direction, avoid shearing and the possibility of spinal column movement.
 - The patient should be moved in either a cephalad or caudal direction, as deemed necessary by the rescuer controlling the head and neck.¹
 - Once positioned patient should be secured to the immobilization device beginning with the torso and extremities.
 - When securing the patient to the spine board, the arms should be kept free to facilitate a variety of diagnostic and treatment techniques.
- The head should always be the last part of the body secured to the device.
 - The head should be secured to the device using 2 separate points of contact, the chin and the forehead, with towel rolls or foam padding placed beside the patient head.
 - Transfer of patient to immobilization device
 - The patient should be restrained and secured sufficiently to the device.
 - The ambulance should be positioned as close to the scene as possible to minimize

transfer on a stretcher over surfaces that may cause body movement.

- Appropriate Transfer of Patient Care to EMT and/or Hospital/ER Staff.

References

1. Swartz, E.E., Boden, B.P., and Courson, R.W., et al. National Athletic Trainers' Association Position Statement: Acute Management of the Cervical Spine-Injured Athlete. *Journal of Athletic Training*. 2009;44(3):306-331.
2. National Athletic Trainers' Association Official Statement: EMS Changes to Pre-Hospital Care of the Athlete with acute cervical spine injury. May 2014.
3. National Athletic Trainers' Association Consensus Statement: Appropriate Prehospital Management of the Spine-Injured Athlete. 2015.

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Exertional Heat Illness

Exertional Heat Illness Policy

Policy

Heat illness is a serious concern, with the potential for long-term health consequences, or even death. Prevention of heat illnesses is critical to the safety and well-being of student athletes.

It is vital to note that individuals may respond to heat differently, and could suffer heat illness at heat indices lower than indicated on the attached charts. Because of this, it is imperative that the Athletic Training and Coaching Staffs ensure the following guidelines are adhered to:

- Educate athletes about heat illness.
- Be aware of the signs and symptoms of heat illness (See Appendix II)
- Monitor student-athletes for these signs and symptoms.
- Encourage student-athletes to report any signs or symptoms that they or a teammate experience to Athletic Training or Coaching Staff.
- Immediately remove any student-athlete observed, or reporting, any signs or symptoms of heat illness, and begin proper treatment (See Procedure)

Heat Illnesses

Heat illness is a broad term, which encompasses some specific conditions. These include:

- Heat Cramps (Exercise Associated Muscle Cramps) and Dehydration
 - Dark urine color
 - Greater than 1.5% of body weight lost due to sweat during activity.
 - Includes: Painful spasms/contractions of large muscle groups (quadriceps, hamstrings, calf, etc.).
 - First sign of heat illness.
- Heat Syncope
 - Can occur at any time during the heat illness cycle.

- Includes: feeling faint, or actually fainting as a result of getting overheated during physical activity.
- Heat Exhaustion
 - Can be potentially life threatening.
 - Inability to sustain adequate cardiac output.
 - Includes: faintness, dizziness, blurred vision, nausea, vomiting, cramping, excessive sweating with cool and clammy skin, weak and rapid pulse, paleness, headache, and abnormal weakness or fatigue.
- Exertional Heat Stroke
 - LIFE THREATENING MEDICAL EMERGENCY
 - Includes: altered mental status, hot and red skin, flushed skin, rapid heart rate, nausea, vomiting, headache, **rectal body temperature ≥ 104 degrees Fahrenheit.**

Acclimatization

It can take student athletes up to 10-16 days to acclimatize to the heat. The Missouri State High School Activity Association (MSHSAA) 16-day heat acclimatization guidelines have been referenced for the purpose of this policy (Appendix III). For National Collegiate Athletic Association (NCAA) sanctioned activities, refer to Appendix IV.

Hydration

Easily accessible water, and ample water breaks should be available at all times during practice/events. Hydration can be measured by numerous means; however, urine color is one of the primary indicators. A urine color chart should be distributed to student athletes and athletic personnel (Appendix V).

Measurement

The Missouri High School Activity Association (MSHSAA), National Collegiate Athletic Association (NCAA), National Athletic Trainers' Association (NATA), and Korey Stringer Institute (KSI) recommend the use of Wet Bulb Globe

Temperature (WBGT) reading for participation guidance in heat. WBGT measures heat in the sun, while Heat Index estimates the heat out of direct sunlight. CoxHealth Sports Medicine follows the MSHSAA Recommended Use of Wet Globe Thermometer (WBGT) for Heat and Humidity Monitoring during Activity protocol. ***Due to minimally controlled timing, quality and quantity of participation, middle school aged student athletes require different WBGT readings and associated modifications from their high school counterparts.*** This is referenced for the purposes of this policy in Appendix VI. The on-site Athletic Trainer, in conjunction with the School Athletic Director/Appointed School Administrator will make all decisions concerning athletic participation on heat days, and will communicate any alterations, postponements, or cancellations of activities to the coaching staff(s).

Preparation

Preparation includes, but is not limited to having quick and easy access to either the ice water immersion tank, or the “taco method”. Access to these methods should be obtainable within five (5) to ten (10) minutes to assure that active full body cooling of the patient can be started within ten (10) minutes.

For water immersion, the tank/pool should be filled with ice and cold water, or have the tub half-filled with water and multiple coolers of ice next to the tub, PRIOR to the event/practice.

For the “taco method”, the tarp should be readily available, with multiple coolers of ice and a water supply, nearby PRIOR to the event/practice.

All cooling should preferably take place within a structure, or temporary tent for patient privacy.

Return To Play

Long-term complications are often directly related to the total time that the core body temperature remained above the critical threshold. Following an Exertional Heat Stroke, physiological changes (i.e. heat tolerance) may be temporarily or permanently compromised.

A Return To Play (RTP) protocol should be implemented to safely return the athlete to full participation.

References

- Armstrong LE, Casa DJ, Millard-Stafford M, Moran DS, Pyne SW, Roberts WO. American College of Sports Medicine position stand: exertional heat illness during training and competition. *Med Sci Sports Exerc.* 2007;39:556-572.
- Binkley HM, Beckett J, Casa DJ, Kleiner DM, Plummer PE. National Athletic Trainers' Association position statement: exertional heat illnesses. *J Athl Train.* 2002;37:329-343.
- Casa DJ, Armstrong LE, Hillman SK, Montain SJ, Beiff RV, Rich BSE, Roberts WO, Stone JA. National athletic trainers' association position statement: Fluid replacement for athletes. *J Athl Train.* 2000;35:212-224.
- Casa DJ, Csillan D. Preseason heat-acclimatization guidelines for secondary school athletics. *J Athl Train.* 2009;44(3):332-333.
- Casa DJ, DeMartini JK, Bergeron MF, et al. National Athletic Trainers' Association position statement: exertional heat illnesses. *J Athl Train.* 2015;50(9):986-1000
- MSHSAA Recommended Use of Wet Bulb Globe Thermometer (WBGT) for Heat and Humidity Monitoring during Activity Retrieved from <https://www.mshsaa.org/resources/PDF/2019%20WBGT%20-%20Recommended%20Guideline%20for%20Heat%20and%20Humidity%20-%20Recommended%20Update.pdf>
- Guidelines for avoiding heat-related problems during practice and events. MSHSAA 2009-2010 Sports Medicine Manual.
- Korey Stringer Institute. *Heat Stroke*. Retrieved from <http://ksi.uconn.edu/emergency-conditions/heat-illnesses/exertional-heat-stroke/>

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Exertional Heat Illness (continued)

Exertional Heat Illness Procedure

Emergency Action Plan for the Care of a Patient with Suspected Heat Illness

Procedures

Suspected Heat Cramps

- Remove patient from activity
- Re-hydration with cool water. Fluid should be sipped slowly to avoid gastrointestinal irritation.
 - Small amount of a commercial sports drink may also be beneficial to increase blood sugar as well
 - 3:1 ration of water to commercial sports drink
 - Intravenous introduction of fluids may be necessary in extreme cases
- Encourage movement of cramping extremity. Contraction of the opposing muscle group activates the cramp, i.e. hamstring cramp—>quadricep voluntary contraction.
- Passive stretching, and massage may also be useful to the affected muscles
- Monitor patient's vital signs
- Monitor for progression to Heat Syncope or Heat Exhaustion, as necessary

Suspected Heat Syncope

- Remove patient from activity
- Move patient to a shaded and cooled area (preferably an air-conditioned area)
- Remove all excess/unneeded clothing and protective equipment
- Elevate legs to promote venous return
- Re-hydration with cool water. Fluid should be sipped slowly to avoid gastrointestinal irritation.
 - Small amount of a commercial sports drink may also be beneficial to increase blood sugar as well

- 3:1 ration of water to commercial sports drink
- Intravenous introduction of fluids may be necessary in extreme cases
- Measure Vital Signs. Measure HR and BP and determine presence/absence of orthostasis and return to activity only after orthostasis has resolved
- Activate EMS, as needed, per facility Emergency Action Plan
- Monitor for progression to Heat Exhaustion

Suspected Heat Exhaustion

- Remove patient from activity
- Move patient to a shaded and cooled area (preferably an air-conditioned area)
- Remove all excess/unneeded clothing and protective equipment
- Elevate legs to promote venous return
- Re-hydration with cool water. Fluid should be sipped slowly to avoid gastrointestinal irritation.
 - Small amount of a commercial sports drink may also be beneficial to increase blood sugar as well
 - 3:1 ration of water to commercial sports drink
 - Intravenous introduction of fluids may be necessary
- Cool the patient with fans, rotating ice towels, or ice bags (arm pits, groin area, neck, behind knees). Consider use dunk tank and taco method as needed.
- Individuals with Heat Exhaustion will typically respond to treatment quickly. If not, suspect progression to Heat Stroke
- Monitor for progression to Heat Stroke

Heat Stroke

- *Exertional Heat Stroke has had a 100% survival rate when immediate cooling was initiated within 10 minutes of patient collapse*

- **Initial Response:** Once Exertional Heat Stroke is suspected, prepare to cool the patient and contact emergency medical services (EMS) per facility Emergency Action Plan (EAP).
- Check airway, breathing, and pulse. Assess central nervous system (CNS) dysfunction.
 - If airway, breathing, pulse and CNS function is adequate for survival, progress to cold-water immersion.
 - If airway, breathing, pulse and CNS function are inadequate, perform necessary precautions and life-saving techniques. In this case, the focus is on advance life support techniques vs rapid body cooling.
 - If there is a concern of Cervical Spine injury, continuous spinal immobilization must be performed during cold-water immersion.
- Remove all excess/unneeded clothing and protective equipment
- Just prior to rapid body cooling, obtain patient's vital signs
 - Obtain rectal temperature using rectal thermometer (if available)
 - Leave thermometer in the rectum during cold-water immersion.
 - DO NOT utilize any other temperature site (oral, axillary, temporal)
 - Heart rate, respiratory rate, blood pressure, and CNS status should be continuously monitored.
- If rectal temperature cannot be measured, cool patient for approximately 10-15 minutes prior to EMS transport
 - An approximate estimate of cooling, via cold water immersion is 1°C for every 5 minutes, or 1°F for every 3 minutes of cooling (if water is aggressively stirred).
- Begin rapid cooling measures (ice water immersion or "Taco Method")
 - Ice water immersion
 - Patient should be submerged up to their neck
 - Monitor patient closely
 - Water ideally should be kept between 35°F(1.7°C) and 59°F(15°C)
 - Water should be continuously stirred to maximize cooling effect
 - Ice should cover the surface of the water at all times
 - PATIENT SHOULD BE REMOVED WHEN CORE TEMPERATURE (per rectal thermometer) REACHES 102°F (39°C).
- Re-hydration with cool water. Fluid should be sipped slowly to avoid gastrointestinal irritation.
 - Small amount of a commercial sports drink may also be beneficial to increase blood sugar as well
 - 3:1 ration of water to commercial sports drink
 - Intravenous introduction of fluids may be necessary
- Transport to advanced care AFTER core temperature cooling has occurred.
 - Advanced cardiac life support supersedes cooling care, if needed

Return to Activity/Play Following Heat Stroke

- Physician clearance is required prior to return to physical activity for Heat Syncope, and Heat Stroke. Patient must be asymptomatic and all lab tests must be normal, including a CK of <500, UA within normal limits and BMP showing no signs of dehydration. Suggest follow up with a physician that is knowledgeable in heat related illnesses.
- Length of recovery time is primarily dictated by the severity of the incident
- Patient should avoid all exercise for at least one week after the incident
- Patient should begin a gradual Return To Play(RTP) program in which they are under the direct supervision of an appropriate health-care professional, such as an Athletic Trainer or Physician

Exertional Heat Illness (continued)

- The type, and length of the RTP program may vary among individuals, but a generalized program may include:
 - Easy to moderate exercise in a climate controlled environment for the prescribed number of days, followed by strenuous exercise in a climate controlled environment for several days
 - Easy to moderate exercise in the heat for the prescribed number of days, followed by strenuous exercise in the heat for the prescribed number of days
 - If applicable to the patient's athletic activity: easy to moderate activity in the heat with equipment for the prescribed number of days, followed by strenuous exercise in the heat for the prescribed number of days

from https://www.ghsa.net/sites/default/files/documents/sports-medicine/GHSA_Heat_Index_Record_Sheet.pdf

Guidelines for avoiding heat-related problems during practice and events. MSHSAA 2009-2010 Sports Medicine Manual.

Korey Stringer Institute. *Heat Stroke*. Retrieved from <http://ksi.uconn.edu/emergency-conditions/heat-illnesses/exertional-heat-stroke/>

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References

- Armstrong LE, Casa DJ, Millard-Stafford M, Moran DS, Pyne SW, Roberts WO. American College of Sports Medicine position stand: exertional heat illness during training and competition. *Med Sci Sports Exerc.* 2007;39:556-572.
- Binkley HM, Beckett J, Casa DJ, Kleiner DM, Plummer PE. National Athletic Trainers' Association position statement: exertional heat illnesses. *J Athl Train.* 2002;37:329-343.
- Casa DJ, Armstrong LE, Hillman SK, Montain SJ, Beiff RV, Rich BSE, Roberts WO, Stone JA. National athletic trainers' association position statement: Fluid replacement for athletes. *J Athl Train.* 2000;35:212-224.
- Casa DJ, Csillan D. Preseason heat-acclimatization guidelines for secondary school athletics. *J Athl Train.* 2009;44(3):332-333.
- Casa DJ, DeMartini JK, Bergeron MF, et al. National Athletic Trainers' Association position statement: exertional heat illnesses. *J Athl Train.* 2015;50(9):986-1000
- Georgia High School Athletic Association. Heat Index Measurement and Record. Retrieved

Epi-Pen Usage

Epi-Pen Usage Policy

Epinephrine is the pharmaceutical drug of choice for the emergency treatment of severe allergic reactions to things such as insect stings/bites, foods, drugs or other allergens; and for basic life support treatment for severe asthma.

The administration of Epinephrine mimics the human body's response of the sympathetic nervous system. Epinephrine quickly constricts blood vessels to improve blood pressure, reduces the leakage from the blood vessels, and relaxes smooth muscle in the bronchioles to improve breathing through bronchodilation. It also helps to alleviate wheezing and dyspnea, stimulates heart rate, and works to reverse the swelling and/or hives of an allergic reaction. The drug takes effect within seconds, but has a short duration of effectiveness (approximately 10-20 minutes).

Athletic Trainers, performing outreach healthcare services, within the CoxHealth Sports Medicine program utilize the Epi-Pen Auto-Injector, a disposable delivery system for self-administration. The Epi-Pen Auto-Injector that will be carried will be the Adult Dosage, which is intended for use on patient who weigh greater than sixty-six (66) pounds. Epi-Pen has a spring activated needle that is designed to deliver a single, precise dose (0.3 mg of 1:1000 solution) of epinephrine when activated. It may be necessary in very severe reactions to administer a second dose after five (5) minutes if the initial response is inadequate.

Indications for Epinephrine Administration

Epinephrine should be administered if the patient exhibits signs and symptoms of severe allergic reactions (anaphylaxis), including respiratory distress and/or shock, or severe asthmatic attack. Patients who have progressed to a severe asthmatic attack may experience a combination of the following: shortness of breath (> 30 respirations/min), mental status

changes (anxious, confused, combative, drowsy), inability to speak in sentences, sweating, and unable to lie down.

Contraindications for Epinephrine Administration

There are no contraindications for the administration of epinephrine in a life-threatening allergic reaction or severe asthmatic attack; however, precautions should be taken with elderly patients, or patients with heart disease or hypertension.

Side Effects

The patient may complain of some side effects following the administration of epinephrine. Possible side effects include increase heart rate, pale skin, dizziness, chest pain, headache, nausea, vomiting, excitability, and anxiousness.

Training in Use of the Epi-Pen Auto Injector

Athletic Trainers should complete a training session each year. This should include the signs, symptoms and emergency medical care for allergic reactions, anaphylaxis, anaphylactic shock, and severe asthmatic attacks. Athletic Trainers should also complete a training sessions each year with instruction in the proper use, and maintenance of the Epi-Pen Auto Injector, as well as practice with the Epi-Pen Trainer.

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Epi-Pen Usage (continued)

Epi-Pen Usage Procedure

Procedure

Emergency Care for Anaphylaxis or Severe Asthmatic Attack

- **Initial Response:** Contact emergency medical services (EMS) per facility Emergency Action Plan (EAP).
- Inspect the Epi-Pen Auto Injector to ensure that the medication has not expired, has not become discolored, and/or does not contain any particulates or sediments.
- Prep injection site with alcohol
- Remove the blue safety release by pulling straight up, without bending or twisting it, from the auto injector.
- Place the tip of the auto injector against the lateral aspect of the patient's thigh, midway between the waist and knee.
- Push the auto injector firmly against the thigh until the spring-loaded needle deploys (will hear a 'click').
- Hold on thigh for approximately ten (10) seconds to deliver the drug.
- Dispose of the auto-injector in a sharps container, being careful to not stick yourself with the protruding needle.
- ***Record the time administered, and the dosage administered. Provide this information to EMS, upon their arrival.***
- ***Any patient requiring epinephrine administration MUST be transported, by EMS, to the nearest available medical facility.***

Reassessment

If patient's condition improves following the administration of epinephrine, continue to perform ongoing assessments of airway, breathing, circulation. Treat for shock, if necessary. Patient may complain of side effects from the epinephrine. ***NOTE: Epinephrine is short acting (10-20 minutes), and symptoms may return as effects of the drug wear off.***

Following administration of epinephrine, it is necessary to reassess the patient. Continued evaluation of airway, breathing, and circulatory status should be performed. Increasing difficulty of breathing, decreasing blood pressure, or decreasing mental status indicates that the allergic reaction or severe asthmatic attack is worsening.

If the patient's condition is worsening, consider the following interventions:

- Injection of a second dose of epinephrine (if a second auto injector is available),
- Provide emergency care for shock,
- Be prepared to administer positive pressure ventilation with supplemental oxygen (if available), if breathing becomes inadequate,
- Be prepared to administer CPR and use of AED, if patient becomes pulseless.

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Lightning

Lightning Policy

Lightning is the most dangerous and frequently encountered thunderstorm hazard that people experience. Over the past century, it has consistently been in the top 2 causes of storm-related deaths in the United States. The National Weather Service reported that in 2010, 48% of lightning fatalities were attributed to sport or recreation activities, with 62% in 2011.

Lightning is a particular danger to the physically active due to the prevalence of afternoon/early evening thunderstorms from late spring to early fall, which is primarily when a lot of outdoor physical activities are taking place.

Lightning Specific Emergency Action Plan

Athletic Trainers, performing outreach healthcare services, within the CoxHealth Sports Medicine program, shall work with school administration to develop a lightning specific Emergency Action Plan (EAP) for each outdoor athletic venue within the school district.

At a minimum, this EAP shall include:

Established Chain of Command: The persons filling the roles below are responsible for making the decision to remove a group or individuals from the playing field/court, stopping the activity, and determining when/if it is safe to resume. The following is recommended by CoxHealth Sports Medicine, but this may be altered, based on the needs of the school/site:

- Practices and Pre/Post Game:
 - Athletic Trainer → School Admin. → Coach → Athletes
- During Competition:
 - Officials/Athletic Trainer → Game Management/School Admin. → Coach/Athletes
- Designated weather watcher
 - On-site Athletic Trainer and/or Athletic Director
 - Game management/School Admin.
 - Coaching staff if above persons are not on-site

- A means of monitoring local weather forecasts
- Computer or smart phone access to weather radar
- A listing of site-specific safe locations
- The use of specific criteria for suspension and resumption of activities

Safe Locations from Lightning

The primary choice for a safe location from the lightning hazard is any substantial, frequently inhabited building. Plumbing and wiring within the structure aid in grounding a building. The secondary choice for a safer location from lightning hazard is a fully enclosed vehicle with a metal roof and the windows closed. Convertible cars, and golf carts, do not provide the protection from lightning. It is important not to touch any part of the metal framework of the vehicle while inside it during ongoing lightning storms.

Avoid being in contact with, or in proximity to, the highest point of an open field or on the open water.

Individuals who feel their hair stand on end, or skin tingle, or hear crackling noises should assume the lightning-safe position which is:

- Crouched on the ground, weight on the balls of the feet, feet together, head lowered, and ears covered. DO NOT lie flat on the ground.

APPROVED: July 2016

REVIEWED: May 2019

Lightning (continued)

Lightning Procedure

Procedure

Weather conditions should be monitored prior to, and during the course of outdoor activities. A lightning detection device, or phone application can be used to help determine the location of lightning in the area, however these devices and applications should not solely be relied on to provide the accurate information needed to make a decision regarding the proximity of lightning.

If inclement weather is approaching/present, the CoxHealth Athletic Trainer, if present and available, should enforce the lightning protocol.

In the absence of the Athletic Trainer, the following flowcharts shall be used:

Practices and Pre/Post Game:

School Admin. → Coach → Athletes

During Competition:

Officials → Game Management/School Admin. → Coach/Athletes

Postpone or suspend activity if a thunderstorm appears imminent before or during an activity or contest (regardless of whether lightning is seen or thunder heard) until the hazard has passed. Signs of imminent thunderstorm activity are darkening clouds, high winds, and thunder or lightning activity.

Detection

Be aware of how close lightning strikes are to the area. The most reliable method is utilizing the “flash to bang” method. This is performed by:

- Count the seconds from the time lightning is sighted, to when the clap of thunder, associated with the strike, is heard.
- For every five (5) seconds you count, the lightning strike is one (1) mile away.
 - For example, if the count is 30 seconds, the strike is six (6) miles away ($30 \div 5 = 6$)

Lightning detectors and/or Smart Phone Applications may be used to aide in the

detection of lightning distance, but should not be relied on for sole determination of detection/distance.

Suspension of Practice/Contest

It is highly recommended to seek a safe structure, or location, at the first sign of lightning.

At a minimum, when lightning is detected by “flash to bang” to be within ten (10) miles (50 second count) of your location, the designated weather watcher will notify the officials/school administration/coaches to remove ALL individuals from the outdoor field of play. All outdoor venues should be completely cleared of individuals by the time the lighting is within six (6) miles (30 seconds).

Resuming Activities

Activity may be resumed thirty (30) minutes following the last lightning strike outside ten (10) miles. If lightning is spotted, or thunder is heard within the thirty (30) minutes, the time will start over at that point.

Lightning Strike Patients

Signs and Symptoms of a Lightning Strike Victim

- Minor:
 - Temporary to no loss of consciousness
 - Possible blindness, deafness, tympanic rupture
 - Confusion/amnesia
 - Stable vital signs (possible hypertension)
 - Possible paresthesia, muscle pain, headache lasting days to months
- Moderate:
 - Disorientation, combative, comatose
 - Possible temporary paralysis of extremities (may be pale, blue, pulseless)
 - Hypovolemic shock; check for blunt abdominal trauma
 - Temporary cardiopulmonary standstill

- 1st and 2nd degree burns usually occur within a few hours after injury
- Severe:
 - Brain damage
 - Hypoxia secondary to cardiac arrest
 - Blunt trauma fractures and intracranial injuries

Treatment

- Make sure the scene is safe to treat the lightning victim. Do not place yourself in harm if danger is imminent
- Move the victim to a safer place, if necessary
- Activate Emergency Medical Services (EMS)
- Evaluate Airway, Breathing and Circulation. Begin CPR if necessary
 - "It is not uncommon to find a lightning strike victim unconscious, with fixed and dilated pupils, with cold extremities and in cardiac arrest. Case studies of individuals with prolonged apnea and asystole after a lightning strike have demonstrated successful resuscitations using CPR. Once stopped, the heart will most likely spontaneously restart, but breathing centers in the brain may be damaged. Respiratory arrest lasts longer than cardiac arrest, leading to secondary asystole from hypoxia. Therefore, the basic principle of Triage, "treat the living first" should be reversed in cases involving casualties from a lightning strike. It is imperative to treat those persons who are "apparently dead" first by promptly initiating CPR."¹
- Evaluate and treat for hypothermia and shock
- Evaluate and treat for burn, fractures, and other injuries.

APPROVED: July 2016

REVIEWED: May 2019

Prescription Medicine Distribution

Prescription Medicine Distribution Policy and Procedure

Policy

Emergency prescription medication will be provided to student-athletes during emergency situations as deemed necessary by an Athletic Training staff member and in compliance with all applicable Emergency Action Protocols. All uses of emergency prescription medications are to be used in compliance with CoxHealth Emergency action protocols and approved by a Team Physician. At CoxHealth sponsored Universities the Athletic Training Department will follow all recommendations made by the NCAA regarding medication distribution.

Procedure

Storage

All emergency prescription medication will be stored in a locked cabinet/medical bag when not in use by the ATC serving in a work duty capacity (covering a event). Only staff certified athletic trainers and team physicians will be permitted to access the medication supply and its contents will be tightly controlled. A copy of the Team Physician's DEA certificate and EAP's will be kept on site where medications will be used, including during travel. The medication will be stored to assure proper environmental (dry with temperatures between 59 and 86 degrees Fahrenheit) and security conditions.

Packaging/Labeling

All emergency prescription medication will be stored and distributed in packages that must include:

- Name of product
- Name and address of manufacturer, packer and distributor
- Net contents
- Name of active ingredients and quantity
- Name of habit-forming drugs in preparation
- Cautions and warnings

- Directions for use

Documentation

Drug-administration records/Incidence reports should be created and maintained when administration occurs, in accordance with applicable law and CoxHealth guidelines. Often this will be done within ATS/Cerner software. The record should be current and easily accessible by appropriate medical personnel. All emergency prescription medications, which are given to student-athletes, must be logged on the appropriate software, recording the following information:

1. Patient's name and date administered
2. Indications for use, description of events including timing of services, total time services rendered, time of EMS arrival.
3. Record the medication, dosage, frequency
4. Lot number

Distribution

Administering any emergency prescription medication will occur within guidance and in accordance with the appropriate Emergency Action protocol for the given situation. No medication will be used outside the parameters of a emergency action protocol

Inventory, Maintenance, and Disposal of Medications

All "drug stocks" must be examined every week for removal of any outdated, deteriorated or recalled medications. Expired emergency prescription medications should be disposed of as recommended by pharmacists. The emergency prescription medication will also be inspected for security a this same interval.

References

Adherence to Drug-Dispensation and Drug-Administration Laws and Guidelines in Collegiate Athletic Training Rooms. *Journal of Athletic Training*. 38(3): 252-258, 2003.

National Athletic Trainers' Association
Consensus Statement: Managing Prescriptions

and Non-Prescription Medication in the Athletic Training Facility. *NATA News*. January 2009.

Courson R, Patel H, Navitskis L, et al.
Policies and procedures in athletic training for dispensing medication. *Athl Ther Today*. 2005;10(1):10-14

2014-2015 NCAA Sports Medicine Handbook.

APPROVED: May 2018

REVIEWED: May 2019



Respiratory Distress

Respiratory Distress Policy

An Albuterol Metered Dose Inhaler will be provided to CoxHealth Athletic Trainers for use in appropriate situations, and in accordance to the Respiratory Distress Policy and Procedure. The Albuterol Metered Dose Inhaler will be clearly labeled with dosing information, as well as the expiration date of the medication. The inhaler should be maintained and inspected by the Athletic Trainer on a regular basis to ensure that it is not empty, and is not past the expiration date. The inhaler should be kept from prolonged exposure to extremes in temperature. The medication, canister, and spacer should be maintained, and cleaned, per manufacturer instructions.

Definitions

Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation. It is defined by the history of the respiratory symptoms, such as wheezing, shortness of breath, chest tightness, and cough that vary over time and in intensity; together with variable airflow limitation.

Asthma is a chronic disease, usually diagnosed in childhood, and managed by a physician with medications, and includes a plan to avoid triggers and/or limit exacerbation. Exacerbations can be acute, and dramatic with symptoms suddenly worsening, but can also be more insidious, with mild symptoms worsening over days.

Exercise-Induced Bronchoconstriction (EIB) describes an acute lower airway narrowing that occurs as a result of exercise. EIB occurs in a substantial proportion of patients diagnosed with asthma, but may also occur in individuals without previously diagnosed asthma.

Albuterol is a bronchodilator; specifically, a short acting beta agonist. It can be used to quickly and effectively alleviate symptoms of Acute Asthma Exacerbation/Exercise (AAE) Induced Bronchoconstriction by relaxing the

smooth muscles that surround the airway. Short acting beta agonists, such as Albuterol, are the choice for relief and AAE and prevention of EIB. Albuterol is administered by inhalation of aerosolized spray from a Metered Dose Inhaler. Albuterol has a rapid onset of less than 15 minutes, to full effect, when inhaled, and has a half-life of six (6) hours.

Side Effects: Side effects of Albuterol may include dizziness, anxiety, palpitations, sweating, muscle tremors

Risk Factors

Intrinsic Factors

- Genetic/Family History
- Obesity
- Male Gender

Extrinsic Factors

- Exposure to Allergens
- Respiratory Illness
- Time of Day
- Extremes of Heat or Cold
- Extremes of Humidity
- NSAID Medications
- Smoke Exposure
- Tight Fitting Uniform or Equipment
- Emotional Distress
- Exercise does not inherently increase the risk for acute asthma exacerbation.

Signs And Symptoms Of Acute Asthma Exacerbation (AAE) and Exercise Induced Bronchoconstriction (EIB)

Patient may present with any of the following:

- Cough
- Audible Wheezing
- Breathlessness
- Chest Tightness
- Elevated Respiratory Rate
- Sputum Production
- Fatigue

- Confusion
- Inability to Speak in Complete Sentences
- Distraction or Confusion
- Progression to Mental Status Changes or Loss of Consciousness

Differential Diagnosis

Signs and Symptoms of Acute Asthma Exacerbation (AAE) and Exercise Induced Bronchoconstriction (EIB) can mimic other serious medical conditions. Athletic Trainers should be mindful of alternative causes of symptoms if the patient does not respond as expected, or if worsening of symptoms occurs despite current course of action.

Differential, or mimicking, conditions can include: upper airway obstruction, inhaled foreign body (choking), anaphylaxis, vocal cord dysfunction, anxiety or panic attack, spontaneous pneumothorax, other obstructive lung diseases (bronchitis, pulmonary disease, etc), cardiac dysfunction.

Training in the Use of The Albuterol Metered Dose Inhaler

Athletic Trainers should complete a training session each year. This should include the signs, symptoms and emergency medical care for Acute Asthma Exacerbation and Exercise Induced Bronchoconstriction. Athletic Trainers should also complete a training sessions each year with instruction in the proper use, and maintenance of the Albuterol Metered Dose Inhaler.

APPROVED: May 2018

REVIEWED: May 2019

Respiratory Distress Procedure

An Albuterol Metered Dose Inhaler will be provided to CoxHealth Athletic Trainers for use in appropriate situations, and in accordance to the Respiratory Distress Policy and Procedure. The Albuterol Metered Dose Inhaler (MDI) will be clearly labeled with dosing information, as well as the expiration date of the medication. The inhaler should be maintained and inspected by the Athletic Trainer on a regular basis to ensure that it is not empty, and is not past the expiration date. The inhaler should be kept from prolonged exposure to extremes in temperature. The medication, canister, and spacer should be maintained, and cleaned, per manufacturer instructions.

Presentation

Acute Asthma Exacerbation (AAE) and Exercise Induced Bronchoconstriction (EIB) should be recognized by the Athletic Trainer so that the affected patient can be safely and appropriately managed.

Signs and Symptoms

Patient may present with any of the following:

- Cough
- Audible Wheezing
- Breathlessness
- Chest Tightness
- Elevated Respiratory Rate
- Sputum Production
- Fatigue
- Confusion
- Inability to Speak in Complete Sentences
- Distraction or Confusion
- Progression to Mental Status Changes or Loss of Consciousness

Differential Diagnosis

Signs and Symptoms of Acute Asthma Exacerbation (AAE) and Exercise Induced Bronchoconstriction (EIB) can mimic other serious medical conditions. Athletic Trainers should be mindful of alternative causes of symptoms if the patient does not respond as

Respiratory Distress (continued)

expected, or if worsening of symptoms occurs despite current course of action.

Differential, or mimicking, conditions can include: upper airway obstruction, inhaled foreign body (choking), anaphylaxis, vocal cord dysfunction, anxiety or panic attack, spontaneous pneumothorax, other obstructive lung diseases (bronchitis, pulmonary disease, etc), cardiac dysfunction.

Response (Appendix VII)

AAE and EIB should be recognized immediately, and managed appropriately to minimize risk and discomfort to the affected patient.

Immediate non-invasive, and non-pharmacologic interventions can decrease stress and anxiety, and help to improve distress. These can include:

- Removing patient from activity
- Move patient to a cool, calm, and quiet environment
- Remove patient from environment that may contain elements that triggered the AAE/EIB
- Removing any restricting equipment and/or clothing, if appropriate
- Encourage diaphragmatic breathing at a slow rate
- Allow patient to position themselves comfortably. Some may prefer sitting or standing vs lying down.

It often becomes necessary for pharmacologic intervention in the management of AAE and EIB. Should this become necessary, Rescue Inhaler and supplemental oxygen (O₂) administration should take place.

- Apply O₂, with facemask, allowing 15L/min flow
- Inspect Albuterol MDI for damage, etc
- Remove cap from MDI
- Shake MDI thoroughly
- If MDI is being used for first time, or if not used within the last two (2) weeks, prime

the MDI with two (2) sprays, shaking the MDI between sprays

- Place paper spacer, if available, over the MDI mouthpiece
- Hold MDI upright, with spacer covering patient's mouth
- Instruct patient to fully exhale, then inhale deeply and slowly for five (5) seconds during MDI administration
- Depress MDI canister fully to dispense one (1) full dose of aerosolized medication
- Instruct patient to slowly inhale, then hold breath for up to ten (10) seconds, then breath normally
- Shake MDI thoroughly, and repeat for second dose
- Discard spacer and clean MDI mouthpiece with isopropyl alcohol, and allow to air dry

Emergent situations can arise in which appropriate response does not adequately control the symptoms of the respiratory distress. In this case, emergency medical services (EMS) should be contacted, per facility Emergency Action Plan (EAP), while looking for other possible causes of respiratory distress. Athletic Trainer should be prepared to administer the Epi-Pen Procedure, CPR and AED use if patient becomes pulseless.

Ongoing Care

Definitive diagnosis, and management of Asthma or EIB should be managed by a primary care or sports medicine physician. The Athletic Trainer should encourage follow-up with a physician for any severe single episode of respiratory distress, for repetitive episodes of respiratory distress (regardless of severity), or an episode of respiratory distress in an individual with no known history of asthma or EIB.

Chronic asthmatics may need an adjustment in plan and/or medications for ongoing symptoms.

Diagnosed Asthmatics

The Respiratory Distress Protocol is not to supersede individual management of a patient with known asthmatic history, as diagnosed by a physician. If a patient has management instructions, from a physician, then the Respiratory Distress Protocol is only to be applied in the event that individual pre-planned instruction, or preventative measures has not been effective.

The Athletic Trainer should encourage student-athletes, with known asthma/EIB, to bring a personal prescribed rescue inhaler to all practices and competitions. If a situation occurs that requires urgency, the provided CoxHealth Health rescue MDI may be used, as instructed per protocol, at the discretion of the Athletic Trainer.

Pertaining to the is Protocol, 'rescue inhaler and MDI' are meant to denote Albuterol MDI. Other inhaled medications fall outside the scope of this Protocol, and should be arranged on an individual basis, with clear understanding between the Athletic Trainer, student athlete, parents/guardians, and the prescribing physician.

APPROVED: May 2018

REVIEWED: May 2019

Sickle Cell

Sickle Cell Policy

Policy

Sickle Cell Trait is an inheritance of one gene for sickle hemoglobin, and one for normal hemoglobin. During periods of intense exercise, the sickle cell trait can change the shape of the red blood cells from round to quarter-moon. When this occurs, these sickled red blood cells can accumulate in the bloodstream (sickling), which can cause ischemic (cell death) rhabdomyolysis. Rhabdomyolysis is defined as the rapid breakdown of muscle cells.

Sickling can occur in 2-3 minutes of intense all-out exercise. Heat, dehydration, altitude, asthma, and other medical conditions may increase the risk. In some cases, particularly with exertional rhabdomyolysis, Sickle Cell Trait can be fatal.

Those at highest risk for Sickle Cell Trait are those individuals with family lineages from Africa, South or Central America, India, Southeast Asia, Saudi Arabia, and Mediterranean countries. Sickle Cell Trait occurs in 8-10% of African Americans, and 1 in 2,000 to 10,000 Caucasians.

Signs and Symptoms of Sickling Collapse

Sickling collapse is often mistaken for cardiac collapse, or heat illness collapse. Unlike sickling collapse, cardiac collapse tends to be instant, and has no muscle cramping with, or prior to it. Unlike, heat illness collapse, sickling collapse often occurs within the first half-hour of exertional exercise, such as during sprinting.

Sickling differs from heat illness/cramping with the following distinctions:

- Heat cramping often has a prodrome of muscle 'twinges', whereas sickling has none
- The pain/discomfort is different, where heat cramping is often described as excruciating
- What stops the athlete from participating is different, where heat crampers often hobble

to a halt with "lock-up" muscles, while sickling athletes slump to the ground with weak muscles

- Physical findings are different, where heat crampers writhe and yell in pain, with muscles visibly contracted and hard; whereas sickling athletes lie fairly still, not yelling in pain, with muscles that look, and have normal muscle tone
- Sickling athletes caught early, and treated correctly, often recover faster than progressive heat crampers

Precautions

For athletes diagnosed with Sickle Cell Trait, the following guidelines should be adhered to:

- Educate the athlete about the signs and symptoms of sickling, and encourage them to report these symptoms immediately. These include: difficulty breathing, fatigue, leg or back pain, leg or back cramping
- The athlete should be involved in year-round strength and conditioning programs. Encourage participation in pre-season strength and conditioning to enhance preparedness of athlete for performance testing. Athletes with Sickle Cell Trait should be excluded from participation in performance tests such as mile runs, serial sprints, etc.
- The athlete is most at risk during the beginning of the season, when conditioning is not at its peak.
- Build up in training slowly, with paced progressions. Allow for longer rest and recovery periods.
- Allow Sickle Cell Trait athletes to set their own pace.
- Cessation of activity with onset of symptoms (muscle "cramping", pain, swelling, muscle weakness, muscle tenderness, inability to "catch breath", fatigue).
- Ambient heat stress, dehydration, asthma, illness, and altitude predispose the athlete

with Sickle Cell Trait to an onset of crisis in physical exertion.

- Adjust work/rest cycles for environmental heat stress
- Emphasize hydration
- Control asthma
- NO workouts if athlete is ill
- Watch athlete closely if the athlete with Sickle Cell Trait is new to increased altitude. Modify training if needed.

Education

Once a CoxHealth Athletic Trainer and/or Physician becomes aware that an athlete has tested positive for the Sickle Cell Trait, the following actions will be taken:

- The Athletic Trainer will confirm the diagnosis with medical records supplied by the athlete/parents/guardians. The Athletic Trainer will then alert the athlete's coaching staff, and athletic director of the athlete's status. Any sharing of protected healthcare information will only take place after written and verbal permission of the athlete and legal guardian. The written permission form will then be given to the appropriate CoxHealth Sports Medicine Medical Director of the school district.
- An educational meeting with all involved parties (athlete, family/legal guardian, athletic director, head coach, athletic trainer, physician) will take place prior to any activity. The athlete, legal guardians, and coaching staff will be educated on the signs and symptoms to be aware of, adjustment to workouts, rest and recovery periods, and proper treatment. The NCAA "Sickle Cell Trait and the Student Athlete" video will also be shown.
- The athlete and legal guardian(s) will be asked to sign a notification form stating that they have received the education, that they understand the information, and that they are fully aware of the risks involved in athletic participation. (See Appendix VIII)

The head coach will also be asked to sign a notification form stating that they have received the education, that they understand the information, and that they agree to follow the guidelines set forth by the Athletic Trainer and/or Physician.

APPROVED: May 2018

Sickling Collapse Procedure

Procedure

Emergency Care for Sickling Collapse

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

- Check vital signs.
 - If airway, breathing and circulation are inadequate for survival, begin Basic Life Support (BLS) Cardiopulmonary Resuscitation (CPR) per most current American Heart Association (AHA) per CoxHealth Sports Medicine Automated External Defibrillator (AED) Procedure. Contact emergency medical services (EMS) per facility Emergency Action Plan (EAP).
 - If airway, breathing and circulation are adequate, administer high-flow oxygen at 15L/min with a non-rebreather mask.
 - If athlete appears to have slowed mental responses, or as vital signs decline, contact emergency medical services (EMS) per facility Action Plan (EAP).
- Cool the athlete, if necessary
- If EMS is necessary, inform them of the Sickle Cell Trait, and to expect rapid rhabdomyolysis and metabolic complications.

APPROVED: May 2018

REVIEWED: May 2019

Skin Disorders

Skin Disorders Policy

Policy

The CoxHealth Sports Medicine Skin Infection Policy follows in accordance with Sports Related Skin Infections Position Statement and Guidelines from the Missouri State High School Activities Association (MSHSAA), the National Federation of State High School Associations (NFHS) Sports Medicine Advisory Committee (SMAC), and the National Athletic Trainer's Association (NATA) position statement on Infectious Skin Disease.

The nature of athletics lends to an environment that may increase the risk of skin infection. While the majority of these infections are transmitted through skin-to-skin contact, a significant number are due to shared equipment, towels, or poor hygiene in general.¹ Trauma, environmental factors, and infectious agents act together to continually attack the integrity of the skin.²

The guidelines set forth follow the principles of Universal Precautions and err in favor of protecting participants in situations where skin-to-skin contact may occur. Consideration may be given to the particular sport with a reduced risk of transmission, but these rules must be strictly adhered to in sports such as wrestling, football, and basketball where skin-to-skin contact is frequent and unavoidable.¹

APPROVED: February 2017

REVIEWED: May 2019

Skin Disorder Procedures

Procedures

General Guidelines

The most common skin infections include fungal infections, viral infections (herpes simplex and molluscum contagiosum) and bacterial infections (impetigo, folliculitis, furuncles, carbuncles and MRSA (methicillin-resistant staphylococcus aureus). Miscellaneous Viral Infections such as molluscum contagiosum and verruca are types of warts that are caused by viruses, but are not considered highly contagious. Therefore, these lesions require no treatment or restrictions, but should be covered if prone to bleeding when abraded.

Tinea Lesions

Clinical Features: These fungal lesions are due to dermatophytes. Lesions often present with a well-defined, round, erythematous, scaly plaque with raised borders; however, tinea corporis (tinea corporis in gladiatorum in wrestlers) frequently presents with a more irregular lesions.² It easily transmissible.

Treatment: The athlete should be treated with an oral or topical antifungal medication for a minimum of 72 hours prior to participation. Once the lesion is considered to be no longer contagious it may be covered with a bio-occlusive dressing, pre-wrap, and tape.

Impetigo, Folliculitis, Carbuncle, Furuncle, MRSA

Clinical Features:

- Impetigo: Bullous impetigo presents on the trunk or the extremities with raised blisters that rupture easily, resulting in moist erosions surrounded by a scaly rim. Nonbullous impetigo presents with thin walled vesicles that rupture into a honey-colored crust.
- Folliculitis: Presents as papules and pustules at the base of hair follicles, especially in areas

that have been shaved, taped, or abraded. Also known as ingrown hair.

- Carbuncle and Furuncle: Furuncles present as tender areas that, over several days, develop a reddened nodular swelling; carbuncles present as the coalescence of multiple furuncles in a deep, communicating, purulent mass.
- MRSA: community-associated MRSA presents similarly to other bacterial infections. Furuncles, carbuncles, and abscesses are the most frequent clinical manifestations. Often community-associated MRSA lesions are confused with spider bites. Lesions may begin as small pustules that develop into larger pustules or abscesses with areas of erythema and some tissue necrosis.

Treatment:

- While these infections may be secondary to a variety of bacteria, they should all be treated as MRSA infections. The athlete should be removed from practices and competition and treated with oral antibiotics. Return to contact practices and competition may occur after 72 hours of treatment providing the infection is resolving.
- All lesions are considered infectious until each one has a well-adherent scab without any drainage or weeping fluids. Once a lesion is no longer considered infectious, it should be covered with a bio occlusive dressing until complete resolution.
- Since nasal colonization of these bacteria is common, recurrent episodes may bring the need to consider treatment with intranasal topical mupirocin and daily body washes with a chlorhexidine 4% solution for at least five days. All team members should be visually screened for similar infections.

Shingles and Cold Sores

Clinical Features: Lesions are typically found on the head, face, neck, or upper extremities and present as clustered, tense vesicles on an erythematous base.

Treatment: Lesions on exposed areas of skin that are not covered by clothing, uniform, or equipment require the player to be withdrawn from any activity that may result in direct skin-to-skin contact with another participant. Covering infectious lesions with an occlusive dressing is not acceptable. Primary outbreaks of shingles and cold sores require 10-14 days of oral antiviral medications while recurrent outbreaks require five days of treatment as a minimum treatment time prior to returning to participation. To be considered “non-contagious,” all lesions must be scabbed over with no oozing or discharge and no new lesions should have occurred in the preceding 48 hours.

Herpes Gladiatorum

Herpes Gladiatorum is a skin infection, primarily seen among wrestlers, that is caused by Herpes Simplex Virus Type 1 (HSV-1). The spreading of this virus is strictly skin-to-skin with the preponderance of the outbreaks developing on the head, face and neck, reflecting the typical lock-up position.

Clinical Features: A raised rash with groupings of 6-10 vesicles (blisters). The skin findings are accompanied by sore throat, fever, malaise and swollen cervical lymph nodes.

Treatment: The infected individual should be removed from contact and treated with antiviral medications for 10-14 days (recurrence 5 days) They may return to contact only after all lesions are healed with well adherent scabs, no new vesicle formation and no swollen lymph nodes near the affected area. Consideration should be given to prophylactic oral antivirals for the remainder of the season and each subsequent season.

Minimum Criteria For Return To Play

Condition	Return to Play
Tinea Lesions	-Minimum 72-hour oral or topical anti-fungal (14 days if on scalp) -Lesions must be covered with bio-occlusive dressing, pre-wrap, and tape
Impetigo, Folliculitis, Carbuncle and Furuncle, MRSA	-No new lesions at least 48 hours -Minimum 72 hour (oral) antibiotic therapy -No moist or draining lesions MRSA lesions must be treated for a minimum of 7 days.
Herpes Gladiatorum (Herpes Simplex-primary), Shingles, Cold Sores	-Free of systemic symptoms (fever, malaise, swollen lymph nodes, etc.) -No new lesions at least 72 hrs -No moist lesions, lesion must be covered by a firm, adherent crust -Minimum of 120 hours (full 5 days) systemic antiviral therapy or 10-13 days therapy if topical medication, or no medication used

References:

1. NFHS SMAC MSHSAA. (2010). Sports related skin infections position statement and guidelines.
2. Zinder, S.M., Basler, S.W., Foley, J., et al. (2010). National athletic trainers' association position statement: Skin Diseases. Journal of Athletic Training. 45(4);411-428.

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REVIEWED: May 2019

Sports Related Concussion

Sports Related Concussion Policy

Definition

"Sport related concussion is a traumatic brain injury induced by biomechanical forces. Several common features that may be utilized in clinically defining the nature of a concussive head injury include:

SRC may be caused by a direct blow to the head, face, neck or elsewhere on the body with an impulsive force transmitted to the head.

SRC typically results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously. However, in some cases, signs and symptoms evolve over a number of minutes to hours.

SRC may result in neuropathological changes, but the acute clinical signs and symptoms largely reflect a functional disturbance rather than a structural injury, and as such, no abnormality is seen on standard structural neuroimaging studies.

SRC results in a range of clinical signs and symptoms that may or may not involve loss of consciousness. Resolution of the clinical and cognitive features typically follows a sequential course. However, in some cases symptoms may be prolonged.

The clinical signs and symptoms cannot be explained by drug, alcohol, or medication use, other injuries (such as cervical injuries, peripheral vestibular dysfunction, etc) or other comorbidities (eg. psychological factors or coexisting medical conditions)."¹

Management

All athletes suspected of sustaining a Sports Related Concussion (SRC) should be thoroughly evaluated by the Athletic Trainer (AT) on-site to determine the proper course of action. If no AT is on-site, the athlete should be immediately removed from activity, and referred to a physician, or the AT for further evaluation.

All patients shall be referred to a physician for final concussion diagnosis within 72 hours of initial injury, whenever possible.

Return To Sport (RTS)

Patient MUST be concussion symptom-free for twenty-four (24) hours prior to beginning the Return to Play (RTP) Procedures After a Concussion (Appendix XI).

References

1. McCrory P, Meeuwisse W, Dvorak J, et al. Consensus Statement on Concussion in Sport – The 5th International Conference on Concussion in Sport held in Berlin, October 2016. *British Journal of Sports Medicine*. Published Online First April 28, 2017

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REVIEWED: May 2019

Sports Related Concussion (SRC) Procedure

"It is important to note that SRC is an evolving injury in the acute phase, with rapidly changing clinical signs and symptoms, which may reflect the underlying physiological injury in the brain. SRC is considered to be among the most complex injuries in sports medicine to diagnose, assess and manage. The majority of SRCs occur without loss of consciousness or frank neurological signs. At present, there is no perfect diagnostic test or marker that clinicians can rely on for an immediate diagnosis of SRC in the sporting environment. Because of this evolving process, it is not possible to rule out SRC when an injury event occurs associated with a transient neurological symptom. ***In all suspected cases of concussion, the individual should be removed from the playing field, and assessed by a physician or licensed healthcare provider...***"¹

Sideline Assessment

"A key concept of sideline assessment is the rapid screening for a suspected SRC, rather than the definitive diagnosis of head injury. Players manifesting clear on-field signs of SRC (eg. loss of consciousness, tonic posturing, balance disturbance) should immediately be

Sports Related Concussion (continued)

removed from sporting participation. Players with a suspected SRC following a significant head impact or with symptoms can proceed to sideline screening, using appropriate tools – for example, SCAT5. Both groups can then proceed to a more thorough diagnostic evaluation, which should be performed in a distraction-free environment (eg locker room, medical room) rather than on the sideline.”¹

“...evolving and delayed-onset symptoms of SRC are well documented and highlight the need to consider follow-up serial evaluations after a suspected SRC regardless of a negative sideline screening test or normal early evaluation. The recognition of suspected SRC is therefore best approached using multidimensional testing guided via expert consensus. The SCAT5 currently represents the most well-established and rigorously developed instrument available for sideline assessment. There is published support for using the SCAT and Child SCAT in the evaluation of SRC. The SCAT is useful immediately after injury in differentiating concussed from non-concussed athletes, but its utility appears decreased significantly 3-5 days after injury. The symptoms checklist, however, does demonstrate clinical utility in tracking recovery.”¹

“The sideline evaluation is based on recognition of injury, assessment of symptoms, cognitive and cranial nerve function, and balance. Serial assessments are often necessary. Because SRC is often an evolving injury, and signs and symptoms may be delayed, erring on the side of caution (ie, keeping an athlete out of participation when there is any suspicion of injury) is important.”¹

Signs and Symptoms

The SRC may include, but is not limited to, one or more of the following signs and symptoms:

- Loss of consciousness
- Headache
- Nausea or vomiting
- Dizziness

- Blurred vision
- Balance problems
- Sensitivity to light and/or noise
- Slowed reaction times
- Difficulty concentrating
- Difficulty remembering
- Drowsiness
- Confusion
- Irritability and/or other behavioral changes
- More emotional than normal

Removal From Play/Practice

If an athlete shows any signs or symptoms of an SRC:

- The individual should be removed from play/practice immediately, and should be evaluated by the on-site Athletic Trainer (or Physician), utilizing standard emergency management principles, paying particular attention to excluding a cervical spine injury.
- After all first aid issues are addressed, an assessment of the injury should be made utilizing the SCAT5 (Appendix IX).
 - The individual should undergo serial assessment for further deterioration for the initial few hours following injury, and should not be left alone.
 - An individual who experiences a witnessed loss of consciousness during play, no matter the duration, will be immediately referred to the Emergency Department.
 - Proceed with use of Cervical Spine policy in the event of a loss of consciousness situation on the field.
 - Any individual diagnosed with a SRC will not be allowed to return to play on the same day of the injury.

Management

- Upon removal from play/practice, the on-site Athletic Trainer (AT), or Physician, will be primarily ruling out any possible cervical spine injury, and/or any other life threatening injuries.
- Following any initial first aid management, the AT should evaluate/assess the athlete utilizing

Sports Related Concussion (continued)

the SCAT5 (Appendix IX) or the Child SCAT5 (Appendix X), dependent on the age of the individual. This should be performed as soon as practical following the injury.

- Upon diagnosis of SRC, the individual will not be allowed to return to play/practice the same day, will not be left by themselves, and will be monitored, for increasing signs/symptoms (every 10-15 minutes), while under the AT's care.
- Coaching staff should be notified, as soon as practical, of athlete's status.
- Parents/guardians of the individual should be contacted, and notified of the injury as soon as is practical.
- If athlete's parents/guardians are not present at the time of injury, and/or are unable to transport the individual home from the game/practice, verbal permission is required from a parent/guardian as to whom can transport the athlete.
- A copy of the SCAT5/Child SCAT5 should be given to athlete/parents/guardians, if possible, to present to the licensed healthcare provider that athlete sees for his/her follow-up to begin Return To Play (RTP) protocol.
- School District Nurse should be notified of the injury, as soon as is feasible, so that proper modifications to school work/attendance may be made, based on school policy.

Return To Play (RTP)

All athletes wishing to return to play following a SRC will be monitored closely.

Any individual diagnosed with a SRC will not be allowed to return to play/practice until the following criteria are met:

- Athlete should be evaluated/assessed by a Healthcare Provider (MD, DO, PAC, ARNP/ Neuropsychologist, LAT) within 72 hours of initial injury for initiation of Return to Play protocol. See Appendix XI for Missouri State High School Activities Association (MSHSAA) Concussion Return to Play Form.

- Emergency Room Physicians cannot clear individuals for progression of the RTP protocol (per MSHSAA)
- It is recommended that the athlete see his/her Primary Care Physician (PCP), or Healthcare Provider recommended by on-site AT, for the initial follow-up visit.
- On-site AT will provide individual/parents/guardians with a list of Healthcare Providers with additional training/expertise in SRC treatment on request.
- Return to Play Protocol will be documented by utilizing the MSHSAA Concussion Return to Play Form (Appendix XI).
- Individual must be asymptomatic, back in school full time without symptoms and have a benign physical exam for a minimum of 24 hours prior to beginning RTP.
- Individual must receive clearance by on-site AT prior to starting RTP protocol.
- Individual must complete graduated RTP protocol and remain asymptomatic during its entirety.
- Individual must receive clearance by on-site AT to return to activity.
- The athlete, parents/guardians, Physician, AT, and Head Coach must all be in agreement that athlete is ready for return to play. If one of these individuals is not in agreement, the individual should be held out for a longer, agreed upon length of time.

References

Missouri State High School Activities Association. MSHSAA Concussion Return To Play Form. Retrieved from <http://www.mshsaa.org/resources/pdf/RTP.pdf>

McCrory P, Meeuwisse W, Dvorak J, et al. Consensus Statement on Concussion in Sport – The 5th International Conference on Concussion in Sport held in Berlin, October 2016. British Journal of Sports Medicine. Published Online First April 28, 2017

APPROVED: January 2010

REVIEWED: May 2019

Appendix I

COXHEALTH SPORTS MEDICINE
Monthly AED Checklist

Athletic Trainer/High School _____

AED CoxHealth Tag Number _____

Date of Latest CoxHealth Bio-Med Preventative Maintenance Check _____

Date and Initials	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
CHECK THE FOLLOWING										
Green Check Mark Showing Unit Is Ready										
Unit Turns On and Cycles										
Unit Clean, Undamaged										
AED Pads Not Expired										
AED Pads Sealed In Package										
Cables Free Of Cracks, Cuts										
Batteries Not Expired										
Accessory Kit Present (razor, towel, gloves, pocket mask)										
Carry Bag Intact and Undamaged										

Initials	Signature

APPENDIX II - Signs and Symptoms of Heat Illness

Heat Syncope Signs & Symptoms

- Dizziness/Light-Headedness
- Weakness
- Tunnel Vision
- Pale or sweaty skin
- Loss of consciousness
- Decreased or weakened pulse

Heat Exhaustion Signs & Symptoms

- Fatigue
- Nausea/Vomiting
- Weakness
- Pale
- Fainting
- Dizziness/Light-Headedness
- Diarrhea
- Chills
- Heavy sweating
- Headache
- Decreased urine output/dehydration
- Irritability
- Decreased blood pressure
- Hyperventilation
- Decreased muscle coordination

Heat Stroke Signs & Symptoms

- Irrational behavior, irritability, emotional instability
- Altered consciousness, coma
- Disorientation or dizziness
- Headache
- Confusion or just look “out of it”
- Nausea or vomiting
- Diarrhea
- Muscle cramps, loss of muscle function/balance, inability to walk
- Collapse, staggering
- Profuse sweating
- Decreasing performance or weakness
- Rapid pulse, low blood pressure, quick breathing

APPENDIX III - Summary of MSHSAA 16-Day Acclimatization Period

Days 1-5

1. Days 1 through 5 of the acclimatization period consist of the first 5 days of formal practice. During this time, athletes are not allowed to participate in more than 1 practice per day.
2. If a practice is interrupted by inclement weather or heat restrictions, the practice may recommence once conditions are deemed safe. Total practice time should not exceed 3 hours in any 1 day.
3. A 1-hour maximum walk-through is permitted during Days 1-5 of the acclimatization period. A 1-hour recovery period is required between the practice and walk-through (or vice-versa).
4. During Days 1-2 of the acclimatization period in sports requiring helmets or shoulder pads, a helmet is the only protective equipment permitted (goalies, as in the case of field hockey and related sports, may not wear full protective gear or perform activities that would require protective equipment. During Days 3-5, only helmets and shoulder pads may be worn. Beginning on Day 6, all protective equipment may be worn and full contact may begin.
 - a. Football Only: On Days 3-5 contact with blocking sleds and tackling dummies may be initiated.
 - b. Full-Contact Sports: 100% live contact drills may begin no earlier than Day 6.

Days 6-16:

5. Beginning no earlier than Day 6 and continuing through Day 14, double-practice days must be followed by a single-practice day. On single-practice days, 1 walk-through is permitted, separated from the practice by at least 1 hour continuous rest. When a double practice day is followed by a rest day,

another double-practice day is permitted after the rest day.

6. On a double-practice day neither practice may exceed 3 hours in duration nor may student-athletes participate in more than 5 total hours of practice. Warm-up, stretching, cool-down, walk-through, conditioning, and weight-room activities must be included as part of the total practice time. The 2 practices must be separated by at least 3 continuous hours in a cool environment.
7. Because the risk of exertional heat illnesses during the preseason heat-acclimatization period is high, it is recommended that an athletic trainer be on site before, during and after all practices. This is not required.

APPENDIX IV - Summary of NCAA vs MSHSAA Acclimatization Period

	NCAA	MSHSAA
Length of Acclimatization	5-day acclimatization period	14-day acclimatization period
Single-Practice Days	<ul style="list-style-type: none"> • Days 1 & 2 only helmets • Days 3 & 4 only helmets & shoulder pads • Days 5+ All equipment 	<ul style="list-style-type: none"> • Days 1 & 2 only helmets • Days 3-5 only helmets & shoulder pads • Days 6+ All equipment
Double-Practice Days	Practice time should not exceed 3 hours	<ul style="list-style-type: none"> • Practice time should not exceed 3 hours • A 1-hour walkthrough is allowed if practice is separated by at least 3 hours
Missed Day Policy	All athletes must complete the heat acclimatization period regardless of arrival to preseason practice	Days which athletes do not practice, either individually or team-wide, do not count to the 14 days
Drills Allowed During Practice	Not regulated	<ul style="list-style-type: none"> • Football may use tackling dummies and blocking sleds on Days 3+ • Live contact drills may be on Days 6+
Medical Coverage	Not regulated	Athletic Trainer recommended to be on site

APPENDIX V - Are you hydrated?
Check the Urine Color Chart

	Hydrated
	Dehydrated

The Urine Color Chart (adapted from Armstrong 2000 *Performing in Extreme Environments*), is used to tell your hydration level based on the color of your urine. The top 3 colors indicate the individual is properly hydrated. The bottom 4 indicate hydration/fluids are needed.

APPENDIX VI - Heat Index Measurements*

SCHOOL: _____

SPORT: _____

DATE	TIME	TEMP (°F)	HUMIDITY	WBGT	ACTIVITY MODIFICATION	INITIALS

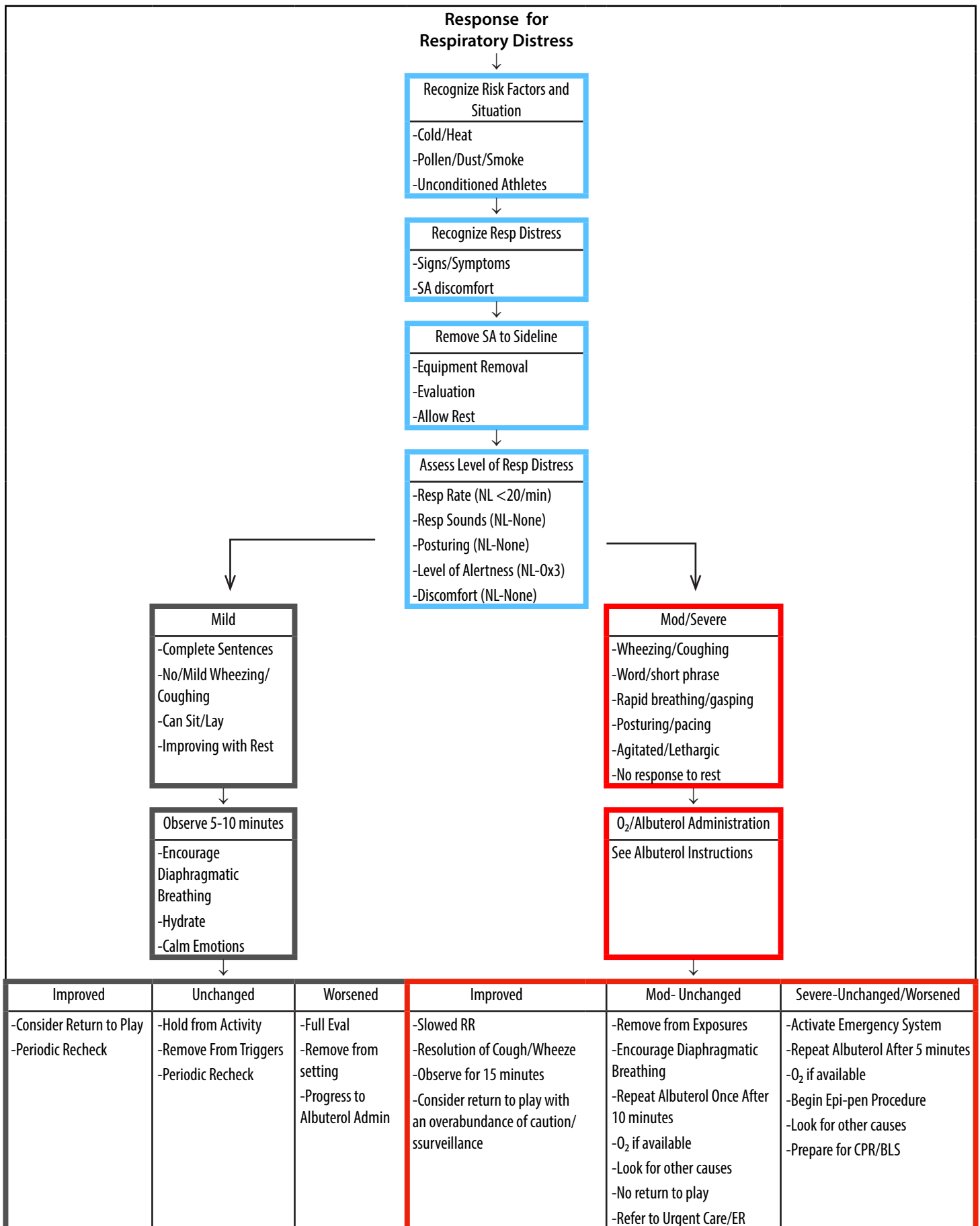
WBGT Reading		ACTIVITY MODIFICATION GUIDELINES
Middle School	High School	
UNDER 82.0	UNDER 82.0	Normal activities - Provide at least 3 separate rest breaks each hour of minimum duration of 3 minutes each.
82.1-83.9	82.1-86.9	Use discretion for intense or prolonged exercise; watch at-risk players carefully; provide at least 3 separate rest breaks each hour of a minimum of 4 minutes duration each.
84.0-86.9	87.0-89.9	Max practice time is 2 hours. FOOTBALL: players restricted to helmet, shoulder pads, and shorts during practice. All protective equipment must be removed for conditioning activities. If the WBGT rises to this level during practice, players may continue to work out wearing football pants without changing to shorts. ALL SPORTS: provide at least 4 separate rest breaks each hour of a minimum of 4 minutes each.
87.0-90.0	90.0-92.0	Max length of practice is 1 hour. FOOTBALL: no protective equipment may be worn during practice, and there may be no conditioning activities. ALL SPORTS: there must be 20 minutes of rest breaks distributed throughout the hour of practice.
OVER 90.1	OVER 92.0	NO OUTDOOR WORKOUTS. Delay practice until a cooler WBGT level is reached.

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 the direct sunlight.
4. When the WBGT reading is over 86:
 - 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.

* Adapted from MSHSAA guidelines

APPENDIX VII - Response for Respiratory Distress



APPENDIX VIII - Sickle Cell Trait Education Acknowledgement

Athlete (please print): _____

Legal Guardian (please print): _____

- I/We understand that the above athlete has been diagnosed with Sickle Cell Trait on _____.
- Athlete will be participating in the sport of _____ at _____ High School during the _____ school year.
- I/We understand that it is the athlete’s responsibility to report any signs and symptoms that they are experiencing while participating in athletics. _____ (initial)
- I/We understand that it is the athlete’s responsibility to report any illness to the sports medicine and coaching staff. _____ (initial)

Athlete Signature: _____ Date: _____

Legal Guardian Signature: _____ Date: _____

Head Coach (please print): _____

- I understand that the above athlete has been diagnosed with Sickle Cell Trait. _____ (initial)
- I have been educated on the signs and symptoms of Sickle Cell Trait. _____ (initial)
- I have been educated on proper treatments of Sickle Cell Trait. _____ (initial)
- I have been made aware that it may be required to adjust workouts, and conditioning programs to meet the needs of this athlete. _____ (initial)

Head Coach Signature: _____ Date: _____

SCAT5[©]

SPORT CONCUSSION ASSESSMENT TOOL – 5TH EDITION

DEVELOPED BY THE CONCUSSION IN SPORT GROUP
 FOR USE BY MEDICAL PROFESSIONALS ONLY

supported by



FIFA®



FEI

Patient details

Name: _____

DOB: _____

Address: _____

ID number: _____

Examiner: _____

Date of Injury: _____ Time: _____

WHAT IS THE SCAT5?

The SCAT5 is a standardized tool for evaluating concussions designed for use by physicians and licensed healthcare professionals¹. The SCAT5 cannot be performed correctly in less than 10 minutes.

If you are not a physician or licensed healthcare professional, please use the Concussion Recognition Tool 5 (CRT5). The SCAT5 is to be used for evaluating athletes aged 13 years and older. For children aged 12 years or younger, please use the Child SCAT5.

Preseason SCAT5 baseline testing can be useful for interpreting post-injury test scores, but is not required for that purpose. Detailed instructions for use of the SCAT5 are provided on page 7. Please read through these instructions carefully before testing the athlete. Brief verbal instructions for each test are given in italics. The only equipment required for the tester is a watch or timer.

This tool may be freely copied in its current form for distribution to individuals, teams, groups and organizations. It should not be altered in any way, re-branded or sold for commercial gain. Any revision, translation or reproduction in a digital form requires specific approval by the Concussion in Sport Group.

Recognise and Remove

A head impact by either a direct blow or indirect transmission of force can be associated with a serious and potentially fatal brain injury. If there are significant concerns, including any of the red flags listed in Box 1, then activation of emergency procedures and urgent transport to the nearest hospital should be arranged.

Key points

- Any athlete with suspected concussion should be REMOVED FROM PLAY, medically assessed and monitored for deterioration. No athlete diagnosed with concussion should be returned to play on the day of injury.
- If an athlete is suspected of having a concussion and medical personnel are not immediately available, the athlete should be referred to a medical facility for urgent assessment.
- Athletes with suspected concussion should not drink alcohol, use recreational drugs and should not drive a motor vehicle until cleared to do so by a medical professional.
- Concussion signs and symptoms evolve over time and it is important to consider repeat evaluation in the assessment of concussion.
- The diagnosis of a concussion is a clinical judgment, made by a medical professional. The SCAT5 should NOT be used by itself to make, or exclude, the diagnosis of concussion. An athlete may have a concussion even if their SCAT5 is “normal”.

Remember:

- The basic principles of first aid (danger, response, airway, breathing, circulation) should be followed.
- Do not attempt to move the athlete (other than that required for airway management) unless trained to do so.
- Assessment for a spinal cord injury is a critical part of the initial on-field assessment.
- Do not remove a helmet or any other equipment unless trained to do so safely.

IMMEDIATE OR ON-FIELD ASSESSMENT

The following elements should be assessed for all athletes who are suspected of having a concussion prior to proceeding to the neurocognitive assessment and ideally should be done on-field after the first first aid / emergency care priorities are completed.

If any of the "Red Flags" or observable signs are noted after a direct or indirect blow to the head, the athlete should be immediately and safely removed from participation and evaluated by a physician or licensed healthcare professional.

Consideration of transportation to a medical facility should be at the discretion of the physician or licensed healthcare professional.

The GCS is important as a standard measure for all patients and can be done serially if necessary in the event of deterioration in conscious state. The Maddocks questions and cervical spine exam are critical steps of the immediate assessment; however, these do not need to be done serially.

STEP 1: RED FLAGS

RED FLAGS:

- Neck pain or tenderness
- Double vision
- Weakness or tingling/burning in arms or legs
- Severe or increasing headache
- Seizure or convulsion
- Loss of consciousness
- Deteriorating conscious state
- Vomiting
- Increasingly restless, agitated or combative

STEP 2: OBSERVABLE SIGNS

Witnessed ☐ Observed on Video ☐

Lying motionless on the playing surface	Y	N
Balance / gait difficulties / motor incoordination: stumbling, slow / laboured movements	Y	N
Disorientation or confusion, or an inability to respond appropriately to questions	Y	N
Blank or vacant look	Y	N
Facial injury after head trauma	Y	N

STEP 3: MEMORY ASSESSMENT MADDOCKS QUESTIONS²

"I am going to ask you a few questions, please listen carefully and give your best effort. First, tell me what happened?"

Mark Y for correct answer / N for incorrect

What venue are we at today?	Y	N
Which half is it now?	Y	N
Who scored last in this match?	Y	N
What team did you play last week / game?	Y	N
Did your team win the last game?	Y	N

Note: Appropriate sport-specific questions may be substituted.

Name: _____
 DOB: _____
 Address: _____
 ID number: _____
 Examiner: _____
 Date: _____

STEP 4: EXAMINATION GLASGOW COMA SCALE (GCS)³

Time of assessment			
Date of assessment			
Best eye response (E)			
No eye opening	1	1	1
Eye opening in response to pain	2	2	2
Eye opening to speech	3	3	3
Eyes opening spontaneously	4	4	4
Best verbal response (V)			
No verbal response	1	1	1
Incomprehensible sounds	2	2	2
Inappropriate words	3	3	3
Confused	4	4	4
Oriented	5	5	5
Best motor response (M)			
No motor response	1	1	1
Extension to pain	2	2	2
Abnormal flexion to pain	3	3	3
Flexion / Withdrawal to pain	4	4	4
Localizes to pain	5	5	5
Obeys commands	6	6	6
Glasgow Coma score (E + V + M)			

CERVICAL SPINE ASSESSMENT

Does the athlete report that their neck is pain free at rest?	Y	N
If there is NO neck pain at rest, does the athlete have a full range of ACTIVE pain free movement?	Y	N
Is the limb strength and sensation normal?	Y	N

In a patient who is not lucid or fully conscious, a cervical spine injury should be assumed until proven otherwise.

OFFICE OR OFF-FIELD ASSESSMENT

Please note that the neurocognitive assessment should be done in a distraction-free environment with the athlete in a resting state.

STEP 1: ATHLETE BACKGROUND

Sport / team / school: _____

Date / time of injury: _____

Years of education completed: _____

Age: _____

Gender: M / F / Other

Dominant hand: left / neither / right

How many diagnosed concussions has the athlete had in the past?: _____

When was the most recent concussion?: _____

How long was the recovery (time to being cleared to play) from the most recent concussion?: _____ (days)

Has the athlete ever been:

Hospitalized for a head injury?	Yes	No
Diagnosed / treated for headache disorder or migraines?	Yes	No
Diagnosed with a learning disability / dyslexia?	Yes	No
Diagnosed with ADD / ADHD?	Yes	No
Diagnosed with depression, anxiety or other psychiatric disorder?	Yes	No

Current medications? If yes, please list:

Name: _____

DOB: _____

Address: _____

ID number: _____

Examiner: _____

Date: _____

2

STEP 2: SYMPTOM EVALUATION

The athlete should be given the symptom form and asked to read this instruction paragraph out loud then complete the symptom scale. For the baseline assessment, the athlete should rate his/her symptoms based on how he/she typically feels and for the post injury assessment the athlete should rate their symptoms at this point in time.

Please Check: ☐ Baseline ☐ Post-Injury

Please hand the form to the athlete

	none	mild		moderate		severe	
Headache	0	1	2	3	4	5	6
"Pressure in head"	0	1	2	3	4	5	6
Neck Pain	0	1	2	3	4	5	6
Nausea or vomiting	0	1	2	3	4	5	6
Dizziness	0	1	2	3	4	5	6
Blurred vision	0	1	2	3	4	5	6
Balance problems	0	1	2	3	4	5	6
Sensitivity to light	0	1	2	3	4	5	6
Sensitivity to noise	0	1	2	3	4	5	6
Feeling slowed down	0	1	2	3	4	5	6
Feeling like "in a fog"	0	1	2	3	4	5	6
"Don't feel right"	0	1	2	3	4	5	6
Difficulty concentrating	0	1	2	3	4	5	6
Difficulty remembering	0	1	2	3	4	5	6
Fatigue or low energy	0	1	2	3	4	5	6
Confusion	0	1	2	3	4	5	6
Drowsiness	0	1	2	3	4	5	6
More emotional	0	1	2	3	4	5	6
Irritability	0	1	2	3	4	5	6
Sadness	0	1	2	3	4	5	6
Nervous or Anxious	0	1	2	3	4	5	6
Trouble falling asleep (if applicable)	0	1	2	3	4	5	6
Total number of symptoms:					of 22		
Symptom severity score:					of 132		
Do your symptoms get worse with physical activity?					Y	N	
Do your symptoms get worse with mental activity?					Y	N	
If 100% is feeling perfectly normal, what percent of normal do you feel?							

If not 100%, why?

Please hand form back to examiner

STEP 3: COGNITIVE SCREENINGStandardised Assessment of Concussion (SAC)⁴**ORIENTATION**

What month is it?	0	1
What is the date today?	0	1
What is the day of the week?	0	1
What year is it?	0	1
What time is it right now? (within 1 hour)	0	1
Orientation score	of 5	

IMMEDIATE MEMORY

The Immediate Memory component can be completed using the traditional 5-word per trial list or optionally using 10-words per trial to minimise any ceiling effect. All 3 trials must be administered irrespective of the number correct on the first trial. Administer at the rate of one word per second.

Please choose EITHER the 5 or 10 word list groups and circle the specific word list chosen for this test.

I am going to test your memory. I will read you a list of words and when I am done, repeat back as many words as you can remember, in any order. For Trials 2 & 3: I am going to repeat the same list again. Repeat back as many words as you can remember in any order, even if you said the word before.

List	Alternate 5 word lists					Score (of 5)		
						Trial 1	Trial 2	Trial 3
A	Finger	Penny	Blanket	Lemon	Insect			
B	Candle	Paper	Sugar	Sandwich	Wagon			
C	Baby	Monkey	Perfume	Sunset	Iron			
D	Elbow	Apple	Carpet	Saddle	Bubble			
E	Jacket	Arrow	Pepper	Cotton	Movie			
F	Dollar	Honey	Mirror	Saddle	Anchor			
Immediate Memory Score						of 15		
Time that last trial was completed								

List	Alternate 10 word lists					Score (of 10)		
						Trial 1	Trial 2	Trial 3
G	Finger	Penny	Blanket	Lemon	Insect			
	Candle	Paper	Sugar	Sandwich	Wagon			
H	Baby	Monkey	Perfume	Sunset	Iron			
	Elbow	Apple	Carpet	Saddle	Bubble			
I	Jacket	Arrow	Pepper	Cotton	Movie			
	Dollar	Honey	Mirror	Saddle	Anchor			
Immediate Memory Score						of 30		
Time that last trial was completed								

Name: _____

DOB: _____

Address: _____

ID number: _____

Examiner: _____

Date: _____

CONCENTRATION**DIGITS BACKWARDS**

Please circle the Digit list chosen (A, B, C, D, E, F). Administer at the rate of one digit per second reading DOWN the selected column.

I am going to read a string of numbers and when I am done, you repeat them back to me in reverse order of how I read them to you. For example, if I say 7-1-9, you would say 9-1-7.

Concentration Number Lists (circle one)					
List A	List B	List C			
4-9-3	5-2-6	1-4-2	Y	N	0
6-2-9	4-1-5	6-5-8	Y	N	1
3-8-1-4	1-7-9-5	6-8-3-1	Y	N	0
3-2-7-9	4-9-6-8	3-4-8-1	Y	N	1
6-2-9-7-1	4-8-5-2-7	4-9-1-5-3	Y	N	0
1-5-2-8-6	6-1-8-4-3	6-8-2-5-1	Y	N	1
7-1-8-4-6-2	8-3-1-9-6-4	3-7-6-5-1-9	Y	N	0
5-3-9-1-4-8	7-2-4-8-5-6	9-2-6-5-1-4	Y	N	1
List D	List E	List F			
7-8-2	3-8-2	2-7-1	Y	N	0
9-2-6	5-1-8	4-7-9	Y	N	1
4-1-8-3	2-7-9-3	1-6-8-3	Y	N	0
9-7-2-3	2-1-6-9	3-9-2-4	Y	N	1
1-7-9-2-6	4-1-8-6-9	2-4-7-5-8	Y	N	0
4-1-7-5-2	9-4-1-7-5	8-3-9-6-4	Y	N	1
2-6-4-8-1-7	6-9-7-3-8-2	5-8-6-2-4-9	Y	N	0
8-4-1-9-3-5	4-2-7-9-3-8	3-1-7-8-2-6	Y	N	1
Digits Score:					of 4

MONTHS IN REVERSE ORDER

Now tell me the months of the year in reverse order. Start with the last month and go backward. So you'll say December, November. Go ahead.

Dec - Nov - Oct - Sept - Aug - Jul - Jun - May - Apr - Mar - Feb - Jan	0	1
Months Score	of 1	
Concentration Total Score (Digits + Months)	of 5	

4

STEP 4: NEUROLOGICAL SCREEN

See the instruction sheet (page 7) for details of test administration and scoring of the tests.

Can the patient read aloud (e.g. symptom check-list) and follow instructions without difficulty?	Y	N
Does the patient have a full range of pain-free PASSIVE cervical spine movement?	Y	N
Without moving their head or neck, can the patient look side-to-side and up-and-down without double vision?	Y	N
Can the patient perform the finger nose coordination test normally?	Y	N
Can the patient perform tandem gait normally?	Y	N

BALANCE EXAMINATION**Modified Balance Error Scoring System (mBESS) testing⁵**

Which foot was tested (i.e. which is the non-dominant foot) ☐ Left ☐ Right

Testing surface (hard floor, field, etc.) _____

Footwear (shoes, barefoot, braces, tape, etc.) _____

Condition	Errors
Double leg stance	_____ of 10
Single leg stance (non-dominant foot)	_____ of 10
Tandem stance (non-dominant foot at the back)	_____ of 10
Total Errors	_____ of 30

Name: _____

DOB: _____

Address: _____

ID number: _____

Examiner: _____

Date: _____

5

STEP 5: DELAYED RECALL:

The delayed recall should be performed after 5 minutes have elapsed since the end of the Immediate Recall section. Score 1 pt. for each correct response.

Do you remember that list of words I read a few times earlier? Tell me as many words from the list as you can remember in any order.

Time Started

Please record each word correctly recalled. Total score equals number of words recalled.

Total number of words recalled accurately: _____ of 5 or _____ of 10

6

STEP 6: DECISION

Domain	Date & time of assessment:		
Symptom number (of 22)			
Symptom severity score (of 132)			
Orientation (of 5)			
Immediate memory	_____ of 15 _____ of 30	_____ of 15 _____ of 30	_____ of 15 _____ of 30
Concentration (of 5)			
Neuro exam	Normal Abnormal	Normal Abnormal	Normal Abnormal
Balance errors (of 30)			
Delayed Recall	_____ of 5 _____ of 10	_____ of 5 _____ of 10	_____ of 5 _____ of 10

Date and time of injury: _____

If the athlete is known to you prior to their injury, are they different from their usual self?

☐ Yes ☐ No ☐ Unsure ☐ Not Applicable

(If different, describe why in the clinical notes section)

Concussion Diagnosed?

☐ Yes ☐ No ☐ Unsure ☐ Not Applicable

If re-testing, has the athlete improved?

☐ Yes ☐ No ☐ Unsure ☐ Not Applicable

I am a physician or licensed healthcare professional and I have personally administered or supervised the administration of this SCAT5.

Signature: _____

Name: _____

Title: _____

Registration number (if applicable): _____

Date: _____

SCORING ON THE SCAT5 SHOULD NOT BE USED AS A STAND-ALONE METHOD TO DIAGNOSE CONCUSSION, MEASURE RECOVERY OR MAKE DECISIONS ABOUT AN ATHLETE'S READINESS TO RETURN TO COMPETITION AFTER CONCUSSION.

CLINICAL NOTES:

Name: _____
DOB: _____
Address: _____
ID number: _____
Examiner: _____
Date: _____



CONCUSSION INJURY ADVICE

(To be given to the person monitoring the concussed athlete)

This patient has received an injury to the head. A careful medical examination has been carried out and no sign of any serious complications has been found. Recovery time is variable across individuals and the patient will need monitoring for a further period by a responsible adult. Your treating physician will provide guidance as to this timeframe.

If you notice any change in behaviour, vomiting, worsening headache, double vision or excessive drowsiness, please telephone your doctor or the nearest hospital emergency department immediately.

Other important points:

Initial rest: Limit physical activity to routine daily activities (avoid exercise, training, sports) and limit activities such as school, work, and screen time to a level that does not worsen symptoms.

- 1) Avoid alcohol
- 2) Avoid prescription or non-prescription drugs without medical supervision. Specifically:
 - a) Avoid sleeping tablets
 - b) Do not use aspirin, anti-inflammatory medication or stronger pain medications such as narcotics
- 3) Do not drive until cleared by a healthcare professional.
- 4) Return to play/sport requires clearance by a healthcare professional.

Clinic phone number: _____

Patient's name: _____

Date / time of injury: _____

Date / time of medical review: _____

Healthcare Provider: _____

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Contact details or stamp

INSTRUCTIONS

Words in *Italics* throughout the SCAT5 are the instructions given to the athlete by the clinician

Symptom Scale

The time frame for symptoms should be based on the type of test being administered. At baseline it is advantageous to assess how an athlete "typically" feels whereas during the acute/post-acute stage it is best to ask how the athlete feels at the time of testing.

The symptom scale should be completed by the athlete, not by the examiner. In situations where the symptom scale is being completed after exercise, it should be done in a resting state, generally by approximating his/her resting heart rate.

For total number of symptoms, maximum possible is 22 except immediately post injury, if sleep item is omitted, which then creates a maximum of 21.

For Symptom severity score, add all scores in table, maximum possible is 22 x 6 = 132, except immediately post injury if sleep item is omitted, which then creates a maximum of 21x6=126.

Immediate Memory

The Immediate Memory component can be completed using the traditional 5-word per trial list or, optionally, using 10-words per trial. The literature suggests that the Immediate Memory has a notable ceiling effect when a 5-word list is used. In settings where this ceiling is prominent, the examiner may wish to make the task more difficult by incorporating two 5-word groups for a total of 10 words per trial. In this case, the maximum score per trial is 10 with a total trial maximum of 30.

Choose one of the word lists (either 5 or 10). Then perform 3 trials of immediate memory using this list.

Complete all 3 trials regardless of score on previous trials.

"I am going to test your memory. I will read you a list of words and when I am done, repeat back as many words as you can remember, in any order." The words must be read at a rate of one word per second.

Trials 2 & 3 MUST be completed regardless of score on trial 1 & 2.

Trials 2 & 3:

"I am going to repeat the same list again. Repeat back as many words as you can remember in any order, even if you said the word before."

Score 1 pt. for each correct response. Total score equals sum across all 3 trials. Do NOT inform the athlete that delayed recall will be tested.

Concentration

Digits backward

Choose one column of digits from lists A, B, C, D, E or F and administer those digits as follows:

Say: *"I am going to read a string of numbers and when I am done, you repeat them back to me in reverse order of how I read them to you. For example, if I say 7-1-9, you would say 9-1-7."*

Begin with first 3 digit string.

If correct, circle "Y" for correct and go to next string length. If incorrect, circle "N" for the first string length and read trial 2 in the same string length. One point possible for each string length. Stop after incorrect on both trials (2 N's) in a string length. The digits should be read at the rate of one per second.

Months in reverse order

"Now tell me the months of the year in reverse order. Start with the last month and go backward. So you'll say December, November ... Go ahead"

1 pt. for entire sequence correct

Delayed Recall

The delayed recall should be performed after 5 minutes have elapsed since the end of the Immediate Recall section.

"Do you remember that list of words I read a few times earlier? Tell me as many words from the list as you can remember in any order."

Score 1 pt. for each correct response

Modified Balance Error Scoring System (mBESS)⁵ testing

This balance testing is based on a modified version of the Balance Error Scoring System (BESS)⁵. A timing device is required for this testing.

Each of 20-second trial/stance is scored by counting the number of errors. The examiner will begin counting errors only after the athlete has assumed the proper start position. The modified BESS is calculated by adding one error point for each error during the three 20-second tests. The maximum number of errors for any single condition is 10. If the athlete commits multiple errors simultaneously, only

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one error is recorded but the athlete should quickly return to the testing position, and counting should resume once the athlete is set. Athletes that are unable to maintain the testing procedure for a minimum of five seconds at the start are assigned the highest possible score, ten, for that testing condition.

OPTION: For further assessment, the same 3 stances can be performed on a surface of medium density foam (e.g., approximately 50cm x 40cm x 6cm).

Balance testing – types of errors

- | | | |
|---------------------------------|---|---|
| 1. Hands lifted off iliac crest | 3. Step, stumble, or fall | 5. Lifting forefoot or heel |
| 2. Opening eyes | 4. Moving hip into > 30 degrees abduction | 6. Remaining out of test position > 5 sec |

"I am now going to test your balance. Please take your shoes off (if applicable), roll up your pant legs above ankle (if applicable), and remove any ankle taping (if applicable). This test will consist of three twenty second tests with different stances."

(a) Double leg stance:

"The first stance is standing with your feet together with your hands on your hips and with your eyes closed. You should try to maintain stability in that position for 20 seconds. I will be counting the number of times you move out of this position. I will start timing when you are set and have closed your eyes."

(b) Single leg stance:

"If you were to kick a ball, which foot would you use? [This will be the dominant foot] Now stand on your non-dominant foot. The dominant leg should be held in approximately 30 degrees of hip flexion and 45 degrees of knee flexion. Again, you should try to maintain stability for 20 seconds with your hands on your hips and your eyes closed. I will be counting the number of times you move out of this position. If you stumble out of this position, open your eyes and return to the start position and continue balancing. I will start timing when you are set and have closed your eyes."

(c) Tandem stance:

"Now stand heel-to-toe with your non-dominant foot in back. Your weight should be evenly distributed across both feet. Again, you should try to maintain stability for 20 seconds with your hands on your hips and your eyes closed. I will be counting the number of times you move out of this position. If you stumble out of this position, open your eyes and return to the start position and continue balancing. I will start timing when you are set and have closed your eyes."

Tandem Gait

Participants are instructed to stand with their feet together behind a starting line (the test is best done with footwear removed). Then, they walk in a forward direction as quickly and as accurately as possible along a 38mm wide (sports tape), 3 metre line with an alternate foot heel-to-toe gait ensuring that they approximate their heel and toe on each step. Once they cross the end of the 3m line, they turn 180 degrees and return to the starting point using the same gait. Athletes fail the test if they step off the line, have a separation between their heel and toe, or if they touch or grab the examiner or an object.

Finger to Nose

"I am going to test your coordination now. Please sit comfortably on the chair with your eyes open and your arm (either right or left) outstretched (shoulder flexed to 90 degrees and elbow and fingers extended), pointing in front of you. When I give a start signal, I would like you to perform five successive finger to nose repetitions using your index finger to touch the tip of the nose, and then return to the starting position, as quickly and as accurately as possible."

References

1. McCrory et al. Consensus Statement On Concussion In Sport – The 5th International Conference On Concussion In Sport Held In Berlin, October 2016. British Journal of Sports Medicine 2017 (available at www.bjsm.bmj.com)
2. Maddocks, DL; Dicker, GD; Saling, MM. The assessment of orientation following concussion in athletes. Clinical Journal of Sport Medicine 1995; 5: 32-33
3. Jennett, B., Bond, M. Assessment of outcome after severe brain damage: a practical scale. Lancet 1975; i: 480-484
4. McCreary M. Standardized mental status testing of acute concussion. Clinical Journal of Sport Medicine. 2001; 11: 176-181
5. Guskiewicz KM. Assessment of postural stability following sport-related concussion. Current Sports Medicine Reports. 2003; 2: 24-30

CONCUSSION INFORMATION

Any athlete suspected of having a concussion should be removed from play and seek medical evaluation.

Signs to watch for

Problems could arise over the first 24-48 hours. The athlete should not be left alone and must go to a hospital at once if they experience:

- Worsening headache
- Drowsiness or inability to be awakened
- Inability to recognize people or places
- Repeated vomiting
- Unusual behaviour or confusion or irritable
- Seizures (arms and legs jerk uncontrollably)
- Weakness or numbness in arms or legs
- Unsteadiness on their feet.
- Slurred speech

Consult your physician or licensed healthcare professional after a suspected concussion. Remember, it is better to be safe.

Rest & Rehabilitation

After a concussion, the athlete should have physical rest and relative cognitive rest for a few days to allow their symptoms to improve. In most cases, after no more than a few days of rest, the athlete should gradually increase their daily activity level as long as their symptoms do not worsen. Once the athlete is able to complete their usual daily activities without concussion-related symptoms, the second step of the return to play/sport progression can be started. The athlete should not return to play/sport until their concussion-related symptoms have resolved and the athlete has successfully returned to full school/learning activities.

When returning to play/sport, the athlete should follow a stepwise, **medically managed exercise progression, with increasing amounts of exercise.** For example:

Graduated Return to Sport Strategy

Exercise step	Functional exercise at each step	Goal of each step
1. Symptom-limited activity	Daily activities that do not provoke symptoms.	Gradual reintroduction of work/school activities.
2. Light aerobic exercise	Walking or stationary cycling at slow to medium pace. No resistance training.	Increase heart rate.
3. Sport-specific exercise	Running or skating drills. No head impact activities.	Add movement.
4. Non-contact training drills	Harder training drills, e.g., passing drills. May start progressive resistance training.	Exercise, coordination, and increased thinking.
5. Full contact practice	Following medical clearance, participate in normal training activities.	Restore confidence and assess functional skills by coaching staff.
6. Return to play/sport	Normal game play.	

In this example, it would be typical to have 24 hours (or longer) for each step of the progression. If any symptoms worsen while exercising, the athlete should go back to the previous step. Resistance training should be added only in the later stages (Stage 3 or 4 at the earliest).

Written clearance should be provided by a healthcare professional before return to play/sport as directed by local laws and regulations.

Graduated Return to School Strategy

Concussion may affect the ability to learn at school. The athlete may need to miss a few days of school after a concussion. When going back to school, some athletes may need to go back gradually and may need to have some changes made to their schedule so that concussion symptoms do not get worse. If a particular activity makes symptoms worse, then the athlete should stop that activity and rest until symptoms get better. To make sure that the athlete can get back to school without problems, it is important that the healthcare provider, parents, caregivers and teachers talk to each other so that everyone knows what the plan is for the athlete to go back to school.

Note: If mental activity does not cause any symptoms, the athlete may be able to skip step 2 and return to school part-time before doing school activities at home first.

Mental Activity	Activity at each step	Goal of each step
1. Daily activities that do not give the athlete symptoms	Typical activities that the athlete does during the day as long as they do not increase symptoms (e.g. reading, texting, screen time). Start with 5-15 minutes at a time and gradually build up.	Gradual return to typical activities.
2. School activities	Homework, reading or other cognitive activities outside of the classroom.	Increase tolerance to cognitive work.
3. Return to school part-time	Gradual introduction of school-work. May need to start with a partial school day or with increased breaks during the day.	Increase academic activities.
4. Return to school full-time	Gradually progress school activities until a full day can be tolerated.	Return to full academic activities and catch up on missed work.

If the athlete continues to have symptoms with mental activity, some other accommodations that can help with return to school may include:

- Starting school later, only going for half days, or going only to certain classes
- More time to finish assignments/tests
- Quiet room to finish assignments/tests
- Not going to noisy areas like the cafeteria, assembly halls, sporting events, music class, shop class, etc.
- Taking lots of breaks during class, homework, tests
- No more than one exam/day
- Shorter assignments
- Repetition/memory cues
- Use of a student helper/tutor
- Reassurance from teachers that the child will be supported while getting better

The athlete should not go back to sports until they are back to school/learning, without symptoms getting significantly worse and no longer needing any changes to their schedule.



Sport concussion assessment tool - 5th edition

Br J Sports Med published online April 26, 2017

Updated information and services can be found at:

<http://bjsm.bmj.com/content/early/2017/04/26/bjsports-2017-097506S>
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APPENDIX X - Child SCAT5

Child SCAT5[®]

SPORT CONCUSSION ASSESSMENT TOOL

FOR CHILDREN AGES 5 TO 12 YEARS

FOR USE BY MEDICAL PROFESSIONALS ONLY

supported by



FIFA[®]



FEI

Patient details

Name: _____

DOB: _____

Address: _____

ID number: _____

Examiner: _____

Date of Injury: _____ Time: _____

WHAT IS THE CHILD SCAT5?

The Child SCAT5 is a standardized tool for evaluating concussions designed for use by physicians and licensed healthcare professionals¹.

If you are not a physician or licensed healthcare professional, please use the Concussion Recognition Tool 5 (CRT5). The Child SCAT5 is to be used for evaluating Children aged 5 to 12 years. For athletes aged 13 years and older, please use the SCAT5.

Preseason Child SCAT5 baseline testing can be useful for interpreting post-injury test scores, but not required for that purpose. Detailed instructions for use of the Child SCAT5 are provided on page 7. Please read through these instructions carefully before testing the athlete. Brief verbal instructions for each test are given in italics. The only equipment required for the tester is a watch or timer.

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Recognise and Remove

A head impact by either a direct blow or indirect transmission of force can be associated with a serious and potentially fatal brain injury. If there are significant concerns, including any of the red flags listed in Box 1, then activation of emergency procedures and urgent transport to the nearest hospital should be arranged.

Key points

- Any athlete with suspected concussion should be REMOVED FROM PLAY, medically assessed and monitored for deterioration. No athlete diagnosed with concussion should be returned to play on the day of injury.
- If the child is suspected of having a concussion and medical personnel are not immediately available, the child should be referred to a medical facility for urgent assessment.
- Concussion signs and symptoms evolve over time and it is important to consider repeat evaluation in the assessment of concussion.
- The diagnosis of a concussion is a clinical judgment, made by a medical professional. The Child SCAT5 should NOT be used by itself to make, or exclude, the diagnosis of concussion. An athlete may have a concussion even if their Child SCAT5 is "normal".

Remember:

- The basic principles of first aid (danger, response, airway, breathing, circulation) should be followed.
- Do not attempt to move the athlete (other than that required for airway management) unless trained to do so.
- Assessment for a spinal cord injury is a critical part of the initial on-field assessment.
- Do not remove a helmet or any other equipment unless trained to do so safely.

IMMEDIATE OR ON-FIELD ASSESSMENT

The following elements should be assessed for all athletes who are suspected of having a concussion prior to proceeding to the neurocognitive assessment and ideally should be done on-field after the first first aid / emergency care priorities are completed.

If any of the "Red Flags" or observable signs are noted after a direct or indirect blow to the head, the athlete should be immediately and safely removed from participation and evaluated by a physician or licensed healthcare professional.

Consideration of transportation to a medical facility should be at the discretion of the physician or licensed healthcare professional.

The GCS is important as a standard measure for all patients and can be done serially if necessary in the event of deterioration in conscious state. The cervical spine exam is a critical step of the immediate assessment, however, it does not need to be done serially.

STEP 1: RED FLAGS

RED FLAGS:

- Neck pain or tenderness
- Double vision
- Weakness or tingling/burning in arms or legs
- Severe or increasing headache
- Seizure or convulsion
- Loss of consciousness
- Deteriorating conscious state
- Vomiting
- Increasingly restless, agitated or combative

STEP 2: OBSERVABLE SIGNS

Witnessed ☐ Observed on Video ☐

Lying motionless on the playing surface	Y	N
Balance / gait difficulties / motor incoordination: stumbling, slow / laboured movements	Y	N
Disorientation or confusion, or an inability to respond appropriately to questions	Y	N
Blank or vacant look	Y	N
Facial injury after head trauma	Y	N

STEP 3: EXAMINATION

GLASGOW COMA SCALE (GCS)²

Time of assessment			
Date of assessment			
Best eye response (E)			
No eye opening	1	1	1
Eye opening in response to pain	2	2	2
Eye opening to speech	3	3	3
Eyes opening spontaneously	4	4	4
Best verbal response (V)			
No verbal response	1	1	1

Name: _____
 DOB: _____
 Address: _____
 ID number: _____
 Examiner: _____
 Date: _____

Incomprehensible sounds	2	2	2
Inappropriate words	3	3	3
Confused	4	4	4
Oriented	5	5	5

Best motor response (M)

No motor response	1	1	1
Extension to pain	2	2	2
Abnormal flexion to pain	3	3	3
Flexion / Withdrawal to pain	4	4	4
Localizes to pain	5	5	5
Obeys commands	6	6	6

Glasgow Coma score (E + V + M)

CERVICAL SPINE ASSESSMENT

Does the athlete report that their neck is pain free at rest?	Y	N
If there is NO neck pain at rest , does the athlete have a full range of ACTIVE pain free movement?	Y	N
Is the limb strength and sensation normal?	Y	N

In a patient who is not lucid or fully conscious, a cervical spine injury should be assumed until proven otherwise.

OFFICE OR OFF-FIELD ASSESSMENT

STEP 1: ATHLETE BACKGROUND

Please note that the neurocognitive assessment should be done in a distraction-free environment with the athlete in a resting state.

Sport / team / school: _____
 Date / time of injury: _____
 Years of education completed: _____
 Age: _____
 Gender: M / F / Other _____
 Dominant hand: left / neither / right _____
 How many diagnosed concussions has the athlete had in the past?: _____
 When was the most recent concussion?: _____
 How long was the recovery (time to being cleared to play) from the most recent concussion?: _____ (days)

Has the athlete ever been:

Hospitalized for a head injury?	Yes	No
Diagnosed / treated for headache disorder or migraines?	Yes	No
Diagnosed with a learning disability / dyslexia?	Yes	No
Diagnosed with ADD / ADHD?	Yes	No
Diagnosed with depression, anxiety or other psychiatric disorder?	Yes	No
Current medications? If yes, please list: _____		

STEP 2: SYMPTOM EVALUATION

The athlete should be **given the symptom form** and asked to **read this instruction paragraph out loud** then complete the symptom scale. For the baseline assessment, the athlete should rate his/her symptoms based on how he/she typically feels and for the post injury assessment the athlete should rate their symptoms at this point in time.

To be done in a resting state

Please Check: ☐ Baseline ☐ Post-Injury

2

Child Report³

	Not at all/ Never	A little/ Rarely	Somewhat/ Sometimes	A lot/ Often
I have headaches	0	1	2	3
I feel dizzy	0	1	2	3
I feel like the room is spinning	0	1	2	3
I feel like I'm going to faint	0	1	2	3
Things are blurry when I look at them	0	1	2	3
I see double	0	1	2	3
I feel sick to my stomach	0	1	2	3
My neck hurts	0	1	2	3
I get tired a lot	0	1	2	3
I get tired easily	0	1	2	3
I have trouble paying attention	0	1	2	3
I get distracted easily	0	1	2	3
I have a hard time concentrating	0	1	2	3
I have problems remembering what people tell me	0	1	2	3
I have problems following directions	0	1	2	3
I daydream too much	0	1	2	3
I get confused	0	1	2	3
I forget things	0	1	2	3
I have problems finishing things	0	1	2	3
I have trouble figuring things out	0	1	2	3
It's hard for me to learn new things	0	1	2	3
Total number of symptoms:			of 21	
Symptom severity score:			of 63	
Do the symptoms get worse with physical activity?			Y	N
Do the symptoms get worse with trying to think?			Y	N

Overall rating for child to answer:

	Very bad	Very good
On a scale of 0 to 10 (where 10 is normal), how do you feel now?	0 1 2 3 4 5 6 7 8 9 10	

If not 10, in what way do you feel different?:

Name: _____
 DOB: _____
 Address: _____
 ID number: _____
 Examiner: _____
 Date: _____

Parent Report

The child:

	Not at all/ Never	A little/ Rarely	Somewhat/ Sometimes	A lot/ Often
has headaches	0	1	2	3
feels dizzy	0	1	2	3
has a feeling that the room is spinning	0	1	2	3
feels faint	0	1	2	3
has blurred vision	0	1	2	3
has double vision	0	1	2	3
experiences nausea	0	1	2	3
has a sore neck	0	1	2	3
gets tired a lot	0	1	2	3
gets tired easily	0	1	2	3
has trouble sustaining attention	0	1	2	3
is easily distracted	0	1	2	3
has difficulty concentrating	0	1	2	3
has problems remembering what he/she is told	0	1	2	3
has difficulty following directions	0	1	2	3
tends to daydream	0	1	2	3
gets confused	0	1	2	3
is forgetful	0	1	2	3
has difficulty completing tasks	0	1	2	3
has poor problem solving skills	0	1	2	3
has problems learning	0	1	2	3
Total number of symptoms:			of 21	
Symptom severity score:			of 63	
Do the symptoms get worse with physical activity?			Y	N
Do the symptoms get worse with mental activity?			Y	N

Overall rating for parent/teacher/coach/carer to answer

On a scale of 0 to 100% (where 100% is normal), how would you rate the child now?

If not 100%, in what way does the child seem different?

STEP 3: COGNITIVE SCREENING

Standardized Assessment of Concussion - Child Version (SAC-C)⁴

IMMEDIATE MEMORY

The Immediate Memory component can be completed using the traditional 5-word per trial list or optionally using 10-words per trial to minimise any ceiling effect. All 3 trials must be administered irrespective of the number correct on the first trial. Administer at the rate of one word per second.

Please choose **EITHER** the 5 or 10 word list groups and circle the specific word list chosen for this test.

I am going to test your memory. I will read you a list of words and when I am done, repeat back as many words as you can remember, in any order. For Trials 2 & 3: I am going to repeat the same list again. Repeat back as many words as you can remember in any order, even if you said the word before.

List	Alternate 5 word lists					Score (of 5)		
						Trial 1	Trial 2	Trial 3
A	Finger	Penny	Blanket	Lemon	Insect			
B	Candle	Paper	Sugar	Sandwich	Wagon			
C	Baby	Monkey	Perfume	Sunset	Iron			
D	Elbow	Apple	Carpet	Saddle	Bubble			
E	Jacket	Arrow	Pepper	Cotton	Movie			
F	Dollar	Honey	Mirror	Saddle	Anchor			
Immediate Memory Score						of 15		
Time that last trial was completed								

List	Alternate 10 word lists					Score (of 10)		
						Trial 1	Trial 2	Trial 3
G	Finger	Penny	Blanket	Lemon	Insect			
	Candle	Paper	Sugar	Sandwich	Wagon			
H	Baby	Monkey	Perfume	Sunset	Iron			
	Elbow	Apple	Carpet	Saddle	Bubble			
I	Jacket	Arrow	Pepper	Cotton	Movie			
	Dollar	Honey	Mirror	Saddle	Anchor			
Immediate Memory Score						of 30		
Time that last trial was completed								

Name: _____
 DOB: _____
 Address: _____
 ID number: _____
 Examiner: _____
 Date: _____

CONCENTRATION

DIGITS BACKWARDS

Please circle the Digit list chosen (A, B, C, D, E, F). Administer at the rate of one digit per second reading DOWN the selected column.

I am going to read a string of numbers and when I am done, you repeat them back to me in reverse order of how I read them to you. For example, if I say 7-1-9, you would say 9-1-7.

Concentration Number Lists (circle one)					
List A	List B	List C			
5-2	4-1	4-9	Y	N	0
4-1	9-4	6-2	Y	N	1
4-9-3	5-2-6	1-4-2	Y	N	0
6-2-9	4-1-5	6-5-8	Y	N	1
3-8-1-4	1-7-9-5	6-8-3-1	Y	N	0
3-2-7-9	4-9-6-8	3-4-8-1	Y	N	1
6-2-9-7-1	4-8-5-2-7	4-9-1-5-3	Y	N	0
1-5-2-8-6	6-1-8-4-3	6-8-2-5-1	Y	N	1
7-1-8-4-6-2	8-3-1-9-6-4	3-7-6-5-1-9	Y	N	0
5-3-9-1-4-8	7-2-4-8-5-6	9-2-6-5-1-4	Y	N	1
List D	List E	List F			
2-7	9-2	7-8	Y	N	0
5-9	6-1	5-1	Y	N	1
7-8-2	3-8-2	2-7-1	Y	N	0
9-2-6	5-1-8	4-7-9	Y	N	1
4-1-8-3	2-7-9-3	1-6-8-3	Y	N	0
9-7-2-3	2-1-6-9-	3-9-2-4	Y	N	1
1-7-9-2-6	4-1-8-6-9	2-4-7-5-8	Y	N	0
4-1-7-5-2	9-4-1-7-5	8-3-9-6-4	Y	N	1
2-6-4-8-1-7	6-9-7-3-8-2	5-8-6-2-4-9	Y	N	0
8-4-1-9-3-5	4-2-7-3-9-8	3-1-7-8-2-6	Y	N	1
Digits Score:					of 5

DAYS IN REVERSE ORDER

Now tell me the days of the week in reverse order. Start with the last day and go backward. So you'll say Sunday, Saturday. Go ahead.

Sunday - Saturday - Friday - Thursday - Wednesday - Tuesday - Monday	0 1
Days Score	of 1
Concentration Total Score (Digits + Days)	of 6

4

STEP 4: NEUROLOGICAL SCREEN

See the instruction sheet (page 7) for details of test administration and scoring of the tests.

Can the patient read aloud (e.g. symptom check-list) and follow instructions without difficulty?	Y	N
Does the patient have a full range of pain-free PASSIVE cervical spine movement?	Y	N
Without moving their head or neck, can the patient look side-to-side and up-and-down without double vision?	Y	N
Can the patient perform the finger nose coordination test normally?	Y	N
Can the patient perform tandem gait normally?	Y	N

BALANCE EXAMINATION**Modified Balance Error Scoring System (BESS) testing⁵**

Which foot was tested (i.e. which is the non-dominant foot) ☐ Left ☐ Right

Testing surface (hard floor, field, etc.) _____

Footwear (shoes, barefoot, braces, tape, etc.) _____

Condition	Errors
Double leg stance	_____ of 10
Single leg stance (non-dominant foot, 10-12 y/o only)	_____ of 10
Tandem stance (non-dominant foot at back)	_____ of 10
Total Errors	5-9 y/o of 20 10-12 y/o of 30

Name: _____

DOB: _____

Address: _____

ID number: _____

Examiner: _____

Date: _____

5

STEP 5: DELAYED RECALL:

The delayed recall should be performed after 5 minutes have elapsed since the end of the Immediate Recall section. Score 1 pt. for each correct response.

Do you remember that list of words I read a few times earlier? Tell me as many words from the list as you can remember in any order.

Time Started

Please record each word correctly recalled. Total score equals number of words recalled.

Total number of words recalled accurately: _____ of 5 or _____ of 10

6

STEP 6: DECISION

Domain	Date & time of assessment:		
Symptom number Child report (of 21) Parent report (of 21)			
Symptom severity score Child report (of 63) Parent report (of 63)			
Immediate memory	of 15 of 30	of 15 of 30	of 15 of 30
Concentration (of 6)			
Neuro exam	Normal Abnormal	Normal Abnormal	Normal Abnormal
Balance errors (5-9 y/o of 20) (10-12 y/o of 30)			
Delayed Recall	of 5 of 10	of 5 of 10	of 5 of 10

Date and time of injury: _____

If the athlete is known to you prior to their injury, are they different from their usual self?

☐ Yes ☐ No ☐ Unsure ☐ Not Applicable

(If different, describe why in the clinical notes section)

Concussion Diagnosed?

☐ Yes ☐ No ☐ Unsure ☐ Not Applicable

If re-testing, has the athlete improved?

☐ Yes ☐ No ☐ Unsure ☐ Not Applicable

I am a physician or licensed healthcare professional and I have personally administered or supervised the administration of this Child SCAT5.

Signature: _____

Name: _____

Title: _____

Registration number (if applicable): _____

Date: _____

SCORING ON THE CHILD SCAT5 SHOULD NOT BE USED AS A STAND-ALONE METHOD TO DIAGNOSE CONCUSSION, MEASURE RECOVERY OR MAKE DECISIONS ABOUT AN ATHLETE'S READINESS TO RETURN TO COMPETITION AFTER CONCUSSION.



For the Neurological Screen (page 5), if the child cannot read, ask him/her to describe what they see in this picture.

Name: _____
 DOB: _____
 Address: _____
 ID number: _____
 Examiner: _____
 Date: _____

CLINICAL NOTES:



Concussion injury advice for the child and parents/carergivers

(To be given to the person monitoring the concussed child)

This child has had an injury to the head and needs to be carefully watched for the next 24 hours by a responsible adult.

If you notice any change in behavior, vomiting, dizziness, worsening headache, double vision or excessive drowsiness, please call an ambulance to take the child to hospital immediately.

Other important points:

Following concussion, the child should rest for at least 24 hours.

- The child should not use a computer, internet or play video games if these activities make symptoms worse.
- The child should not be given any medications, including pain killers, unless prescribed by a medical doctor.
- The child should not go back to school until symptoms are improving.
- The child should not go back to sport or play until a doctor gives permission.

Clinic phone number: _____

Patient's name: _____

Date / time of injury: _____

Date / time of medical review: _____

Healthcare Provider: _____

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Contact details or stamp

INSTRUCTIONS

Words in *Italics* throughout the Child SCAT5 are the instructions given to the athlete by the clinician

Symptom Scale

In situations where the symptom scale is being completed after exercise, it should still be done in a resting state, at least 10 minutes post exercise.

At Baseline	On the day of injury	On all subsequent days
<ul style="list-style-type: none"> The child is to complete the Child Report, according to how he/she feels today, and The parent/carer is to complete the Parent Report according to how the child has been over the previous week. 	<ul style="list-style-type: none"> The child is to complete the Child Report, according to how he/she feels now. If the parent is present, and has had time to assess the child on the day of injury, the parent completes the Parent Report according to how the child appears now. 	<ul style="list-style-type: none"> The child is to complete the Child Report, according to how he/she feels today, and The parent/carer is to complete the Parent Report according to how the child has been over the previous 24 hours.

For Total number of symptoms, maximum possible is 21

For Symptom severity score, add all scores in table, maximum possible is $21 \times 3 = 63$

Standardized Assessment of Concussion Child Version (SAC-C) Immediate Memory

Choose one of the 5-word lists. Then perform 3 trials of immediate memory using this list.

Complete all 3 trials regardless of score on previous trials.

"I am going to test your memory. I will read you a list of words and when I am done, repeat back as many words as you can remember, in any order." The words must be read at a rate of one word per second.

OPTION: The literature suggests that the Immediate Memory has a notable ceiling effect when a 5-word list is used. (In younger children, use the 5-word list). In settings where this ceiling is prominent the examiner may wish to make the task more difficult by incorporating two 5-word groups for a total of 10 words per trial. In this case the maximum score per trial is 10 with a total trial maximum of 30.

Trials 2 & 3 MUST be completed regardless of score on trial 1 & 2.

Trials 2 & 3: *"I am going to repeat the same list again. Repeat back as many words as you can remember in any order, even if you said the word before."*

Score 1 pt. for each correct response. Total score equals sum across all 3 trials. Do NOT inform the athlete that delayed recall will be tested.

Concentration

Digits backward

Choose one column only, from List A, B, C, D, E or F, and administer those digits as follows:

"I am going to read you some numbers and when I am done, you say them back to me backwards, in reverse order of how I read them to you. For example, if I say 7-1, you would say 1-7."

If correct, circle "Y" for correct and go to next string length. If incorrect, circle "N" for the first string length and read trial 2 in the same string length. One point possible for each string length. Stop after incorrect on both trials (2 N's) in a string length. The digits should be read at the rate of one per second.

Days of the week in reverse order

"Now tell me the days of the week in reverse order. Start with Sunday and go backward. So you'll say Sunday, Saturday ... Go ahead"

1 pt. for entire sequence correct

Delayed Recall

The delayed recall should be performed after at least 5 minutes have elapsed since the end of the Immediate Recall section.

"Do you remember that list of words I read a few times earlier? Tell me as many words from the list as you can remember in any order."

Circle each word correctly recalled. Total score equals number of words recalled.

Neurological Screen

Reading

The child is asked to read a paragraph of text from the instructions in the Child SCAT5. For children who can not read, they are asked to describe what they see in a photograph or picture, such as that on page 6 of the Child SCAT5.

Modified Balance Error Scoring System (mBESS)* testing

These instructions are to be read by the person administering the Child SCAT5, and each balance task should be demonstrated to the child. The child should then be asked to copy what the examiner demonstrated.

Each of 20-second trial/stance is scored by counting the number of errors. The This balance testing is based on a modified version of the Balance Error Scoring System (BESS)*.

A stopwatch or watch with a second hand is required for this testing.

"I am now going to test your balance. Please take your shoes off, roll up your pants above your ankle (if applicable), and remove any ankle taping (if applicable). This test will consist of two different parts."

OPTION: For further assessment, the same 3 stances can be performed on a surface of medium density foam (e.g., approximately 50cm x 40cm x 6cm).

(a) Double leg stance:

The first stance is standing with the feet together with hands on hips and with eyes closed. The child should try to maintain stability in that position for 20 seconds. You should inform the child that you will be counting the number of times the child moves out of this position. You should start timing when the child is set and the eyes are closed.

(b) Tandem stance:

Instruct or show the child how to stand heel-to-toe with the non-dominant foot in the back. Weight should be evenly distributed across both feet. Again, the child should try to maintain stability for 20 seconds with hands on hips and eyes closed. You should inform the child that you will be counting the number of times the child moves out of this position. If the child stumbles out of this position, instruct him/her to open the eyes and return to the start position and continue balancing. You should start timing when the child is set and the eyes are closed.

(c) Single leg stance (10-12 year olds only):

"If you were to kick a ball, which foot would you use? [This will be the dominant foot] Now stand on your other foot. You should bend your other leg and hold it up (show the child). Again, try to stay in that position for 20 seconds with your hands on your hips and your eyes closed. I will be counting the number of times you move out of this position. If you move out of this position, open your eyes and return to the start position and keep balancing. I will start timing when you are set and have closed your eyes."

Balance testing – types of errors

- | | | |
|---------------------------------|---|---|
| 1. Hands lifted off iliac crest | 3. Step, stumble, or fall | 5. Lifting forefoot or heel |
| 2. Opening eyes | 4. Moving hip into > 30 degrees abduction | 6. Remaining out of test position > 5 sec |

Each of the 20-second trials is scored by counting the errors, or deviations from the proper stance, accumulated by the child. The examiner will begin counting errors only after the child has assumed the proper start position. The modified BESS is calculated by adding one error point for each error during the 20-second tests. The maximum total number of errors for any single condition is 10. If a child commits multiple errors simultaneously, only one error is recorded but the child should quickly return to the testing position, and counting should resume once subject is set. Children who are unable to maintain the testing procedure for a minimum of five seconds at the start are assigned the highest possible score, ten, for that testing condition.

Tandem Gait

Instruction for the examiner - Demonstrate the following to the child:

The child is instructed to stand with their feet together behind a starting line (the test is best done with footwear removed). Then, they walk in a forward direction as quickly and as accurately as possible along a 38mm wide (sports tape), 3 metre line with an alternate foot heel-to-toe gait ensuring that they approximate their heel and toe on each step. Once they cross the end of the 3m line, they turn 180 degrees and return to the starting point using the same gait. Children fail the test if they step off the line, have a separation between their heel and toe, or if they touch or grab the examiner or an object.

Finger to Nose

The tester should demonstrate it to the child.

"I am going to test your coordination now. Please sit comfortably on the chair with your eyes open and your arm (either right or left) outstretched (shoulder flexed to 90 degrees and elbow and fingers extended). When I give a start signal, I would like you to perform five successive finger to nose repetitions using your index finger to touch the tip of the nose as quickly and as accurately as possible."

Scoring: 5 correct repetitions in < 4 seconds = 1

Note for testers: Children fail the test if they do not touch their nose, do not fully extend their elbow or do not perform five repetitions.

References

- McCrory et al. Consensus Statement On Concussion In Sport – The 5th International Conference On Concussion In Sport Held In Berlin, October 2016. British Journal of Sports Medicine 2017 (available at www.bjsm.bmj.com)
- Jennett, B., Bond, M. Assessment of outcome after severe brain damage: a practical scale. Lancet 1975; i: 480-484
- Ayr, L.K., Yeates, K.O., Taylor, H.G., Brown, M. Dimensions of postconcussive symptoms in children with mild traumatic brain injuries. Journal of the International Neuropsychological Society. 2009; 15:19–30
- McCrea M. Standardized mental status testing of acute concussion. Clinical Journal of Sports Medicine. 2001; 11: 176-181
- Guskiewicz KM. Assessment of postural stability following sport-related concussion. Current Sports Medicine Reports. 2003; 2: 24-30

CONCUSSION INFORMATION

If you think you or a teammate has a concussion, tell your coach/trainer/parent right away so that you can be taken out of the game. You or your teammate should be seen by a doctor as soon as possible. YOU OR YOUR TEAMMATE SHOULD NOT GO BACK TO PLAY/SPORT THAT DAY.

Signs to watch for

Problems can happen over the first 24-48 hours. You or your teammate should not be left alone and must go to a hospital right away if any of the following happens:

- New headache, or headache gets worse
- Neck pain that gets worse
- Becomes sleepy/drowsy or can't be woken up
- Cannot recognise people or places
- Feeling sick to your stomach or vomiting
- Acting weird/strange, seems/feels confused, or is irritable
- Has any seizures (arms and/or legs jerk uncontrollably)
- Has weakness, numbness or tingling (arms, legs or face)
- Is unsteady walking or standing
- Talking is slurred
- Cannot understand what someone is saying or directions

Consult your physician or licensed healthcare professional after a suspected concussion. Remember, it is better to be safe.

Graduated Return to Sport Strategy

After a concussion, the child should rest physically and mentally for a few days to allow symptoms to get better. In most cases, after a few days of rest, they can gradually increase their daily activity level as long as symptoms don't get worse. Once they are able to do their usual daily activities without symptoms, the child should gradually increase exercise in steps, guided by the healthcare professional (see below).

The athlete should not return to play/sport the day of injury.

NOTE: An initial period of a few days of both cognitive ("thinking") and physical rest is recommended before beginning the Return to Sport progression.

Exercise step	Functional exercise at each step	Goal of each step
1. Symptom-limited activity	Daily activities that do not provoke symptoms.	Gradual reintroduction of work/school activities.
2. Light aerobic exercise	Walking or stationary cycling at slow to medium pace. No resistance training.	Increase heart rate.
3. Sport-specific exercise	Running or skating drills. No head impact activities.	Add movement.
4. Non-contact training drills	Harder training drills, e.g., passing drills. May start progressive resistance training.	Exercise, coordination, and increased thinking.
5. Full contact practice	Following medical clearance, participate in normal training activities.	Restore confidence and assess functional skills by coaching staff.
6. Return to play/sport	Normal game play.	

There should be at least 24 hours (or longer) for each step of the progression. If any symptoms worsen while exercising, the athlete should go back to the previous step. Resistance training should be added only in the later stages (Stage 3 or 4 at the earliest). The athlete should not return to sport until the concussion symptoms have gone, they have successfully returned to full school/learning activities, and the healthcare professional has given the child written permission to return to sport.

If the child has symptoms for more than a month, they should ask to be referred to a healthcare professional who is an expert in the management of concussion.

Graduated Return to School Strategy

Concussion may affect the ability to learn at school. The child may need to miss a few days of school after a concussion, but the child's doctor should help them get back to school after a few days. When going back to school, some children may need to go back gradually and may need to have some changes made to their schedule so that concussion symptoms don't get a lot worse. If a particular activity makes symptoms a lot worse, then the child should stop that activity and rest until symptoms get better. To make sure that the child can get back to school without problems, it is important that the health care provider, parents/caregivers and teachers talk to each other so that everyone knows what the plan is for the child to go back to school.

Note: If mental activity does not cause any symptoms, the child may be able to return to school part-time without doing school activities at home first.

Mental Activity	Activity at each step	Goal of each step
1. Daily activities that do not give the child symptoms	Typical activities that the child does during the day as long as they do not increase symptoms (e.g. reading, texting, screen time). Start with 5-15 minutes at a time and gradually build up.	Gradual return to typical activities.
2. School activities	Homework, reading or other cognitive activities outside of the classroom.	Increase tolerance to cognitive work.
3. Return to school part-time	Gradual introduction of school-work. May need to start with a partial school day or with increased breaks during the day.	Increase academic activities.
4. Return to school full-time	Gradually progress school activities until a full day can be tolerated.	Return to full academic activities and catch up on missed work.

If the child continues to have symptoms with mental activity, some other things that can be done to help with return to school may include:

- Starting school later, only going for half days, or going only to certain classes
- More time to finish assignments/tests
- Quiet room to finish assignments/tests
- Not going to noisy areas like the cafeteria, assembly halls, sporting events, music class, shop class, etc.
- Taking lots of breaks during class, homework, tests
- No more than one exam/day
- Shorter assignments
- Repetition/memory cues
- Use of a student helper/tutor
- Reassurance from teachers that the child will be supported while getting better

The child should not go back to sports until they are back to school/learning, without symptoms getting significantly worse and no longer needing any changes to their schedule.

APPENDIX XI - MSHSAA Concussion Return to Play Form

If diagnosed with a concussion, an athlete must be cleared for progression to activity by an approved healthcare provider, MD/DO/PAC/LAT/ARNP/Neuropsychologist (Emergency Room physician cannot clear for progression).

Athlete's Name: _____ DOB: _____ Date of Injury: _____

THIS RETURN TO PLAY IS BASED ON TODAY'S EVALUATION

Date of Evaluation: _____ Return to School On (Date): _____

The following are the return to physical activities recommendations at the present time:

- ☐ Diagnosed with a concussion: Cannot return to physical activity, sport or competition (must be re-evaluated).
- ☐ Diagnosed with a concussion: May return to sports participation under the supervision of your school's administration after completing the return to play protocol (see below).
- ☐ Not diagnosed with a concussion. Patient has diagnosis of _____ and MAY/MAY NOT return to play at this time.

Medical Office Information (Please Print/Stamp):

Evaluator's Name: _____ Office Phone: _____

Evaluator's Specialty: _____

Evaluator's Signature: _____

Evaluator's Address: _____

Return to Play (RTP) Procedures After a Concussion

Return to activity and play is a medical decision. Progression is individualized, must be closely supervised according to the school's policies and procedures, and will be determined on a case-by-case basis. Factors that may affect the rate of progression include: previous history of concussion, duration and type of symptoms, age of the athlete, and sport/activity in which the athlete participates. An athlete with a prior history of concussion, one who has had an extended duration of symptoms, or one who is participating in a collision or contact sport may be progressed more slowly as determined by the healthcare provider who has evaluated the athlete. After the student has not experienced symptoms attributable to the concussion for a **minimum of 24 hours** and has returned to school on a full-time basis (if school is in session), the stepwise progression below shall be followed:

- Step 1:** Light cardiovascular exercise.
- Step 2:** Running in the gym or on the field. No helmet or other equipment.
- Step 3:** Non-contact training drills in full equipment. Weight-training can begin.
- Step 4:** Full, normal practice or training (a walk-through practice does not count as a full, normal practice).
- Step 5:** **Full participation.** Must be cleared by MD/DO/PAC/LAT/ARNP/Neuropsychologist before returning to play.

The athlete should spend a minimum of one day at each step before advancing to the next. If concussion symptoms return with any step, the athlete must stop the activity and the treating healthcare provider must be contacted. Depending upon the specific type and severity of the symptoms, the athlete may be told to rest for 24 hours and then resume activity at a level one step below where he or she was at when the symptoms returned.

Return to Play Protocol (Steps 1-4) Completed (Date/Signature): _____

Cleared for Return to Play (Step 5) by: _____ Date: _____

I accept responsibility for reporting all injuries and illnesses to my school and medical staff (athletic trainer/team physician) including any signs and symptoms of a CONCUSSION.

Signature of Student Athlete: _____ Date: _____

May be advanced back to competition after phone conversation with the healthcare professional that evaluated the athlete (MD/DO/PAC/LAT/ARNP/Neuropsychologist) and documented above.

This form is adapted from the Acute Concussion Evaluation (ACE) care plan on the CDC website (www.cdc.gov/injury). All medical providers are encouraged to review this site if they have questions regarding the latest information on the evaluation and care of the scholastic athlete following a concussion injury.

