Coastal Carolina University
Athletic Training Department
Policy and Procedure Manual
Concussion Management
Revised/Reviewed 7/26/2011

INTRODUCTION:

Concussion classification, management, and protocols have been an evolving area of both concern and interest in the field of sports medicine. The health professionals that care for athletes need to be well educated and trained to recognize the signs and symptoms of a concussion.

Several facts need to be understood in order to best assess and evaluate the athlete:

1) It is estimated that over 1 million sports-related concussions occur annually
2) Often times concussion symptoms may not occur until 2-3 days after the trauma occurred
3) Complete recovery from concussion symptoms may take days to weeks to months
4) Premature return to play may prolong the concussion from totally resolving
5) "Second-impact Syndrome" and long term symptoms can occur if premature return to play is allowed
6) Proper evaluation and management can reduce the incidence of dangerous outcomes
7) The development of proper concussion management protocols are a must with the Sports Medicine Physicians and Athletic Trainers having a full understanding of the protocols
8) Athletes need proper sideline evaluation to determine the appropriateness of in-game return to play and proper post-game follow up protocols
9) Objective post-concussion evaluation tools (i.e. Daily symptom checklist, IMPACT, BESS) as well as clinical assessment should be used to assist the Sports Medicine Team to determine when return to play is acceptable

**** It is the Athletic Training department's policy that we will not use a formal grading scale but rather will focus attention on the athlete's recovery via a symptom checklist and neurocognitive testing.**

PROCEDURE:

Be sure to document all pertinent information about the concussive injury, including but not limited to:

(1) Mechanism of injury
(2) Initial signs and symptoms
(3) State of consciousness
(4) Findings on serial testing of symptoms and neuropsychological function and postural tests
(5) Instructions given to the athlete, roommate, or parent
(6) Recommendations provided by the physician
(7) Date and time of return to participation
(8) Relevant information on the player's history of prior concussion and associated recovery pattern.

All Student-Athletes will receive a baseline cognitive test using the ImPACT Concussion Management System.

ImPACT Concussion Management
Includes a web based neurocognitive test which measures reaction time, memory, concentration, and delayed recall. When the injured athlete is suspected of having a concussion, he/she takes a post trauma test and the results are statistically compared with the athlete's baseline and presented in a trauma report establishing a Reliable Change Index (RCI). RCI values that are below norms are highlighted and are significant as signs of neurocognitive deficits. RCI scores that stay within norms can also demonstrate decrease performance in testing, and can be used to show that symptoms still exist. The ImPACT Concussion Management test has been thoroughly researched and found to be valid and reliable.

Neuroimaging
CT and MRIs have been found to be of little value in assessing less severe head injuries, such as cerebral concussion, and contributing to the return to play decision. A CT scan is often indicated emergently if a focal injury such as an acute subdural or epidural bleed is suspected. Presently no neuroanatomic or physiologic measurements can be used to determine the severity of a concussion or when complete recovery has occurred in an individual athlete after a concussion.

Protocol:
1. Perform initial evaluation
- Refer to a physician on the day-of injury if there is:
    - Any case of loss of consciousness
    - Amnesia lasting longer than 15 minutes
    - Deterioration of neurological function*
    - Decrease level of consciousness*
    - Decrease or irregularity in respirations*
    - Decrease or irregularity in pulse*
    - Increase blood pressure
    - Unequal, dilated, or unreactive pupils*
    - Cranial nerve deficits
    - Any signs or symptoms of associated spine or skull fracture
    - Sustained mental status changes: lethargy, difficulty maintaining arousal, confusion, or agitation*
    - Seizure activity*
    - Vomiting
    - Motor deficits subsequent to initial on-field assessment
    - Sensory deficits subsequent to initial on-field assessment
    - Sustained balance deficits
    - Post-concussion symptoms that worsen in severity
    - Additional post-concussion symptoms as compared to those on the field
    - **Call EMS Immediately**

2. Recheck signs and symptoms every 5 minutes until stable. After a minimal 20 minute rest period, if the athlete is asymptomatic perform an exertional exercise battery of sideline jogging, sprinting and sport-specific non-contact skills if he/she is still asymptomatic return to play is at the discretion of the supervising athletic trainer.

3. Athletes who are symptomatic for longer 20 minutes should be disqualified from returning to play on the day of injury and perform an ImPACT trauma test 48-72 hours post-injury.

The results from the test should be compared to baseline scores. If none of the above conditions are present the athlete may be sent home with a roommate, friend, or parent and given the home care instruction sheet. The head team physician should be called and notified of the situation.

4. The head injured athlete should perform a follow-up ImPACT exam 48-72 hours after initial exam and repeat every 3 days until symptom free. The testing area should be kept quiet and free from distraction. He/she should be referred to the head team physician for further evaluation.

5. The results of a test should be presented to the head team physician. Regardless of the results of the ImPACT trauma report return to play decisions will lie with the head team physician and supervising athletic trainer.

6. The head injured athlete will return to a minimum of one day no contact practice including sport specific drills and exercise/workouts. If he/she is still asymptomatic full return to play may resume.

7. After a minimum two week return period, the head injured athlete should repeat the ImPACT to establish a new baseline cognitive test.

*Guskiewicz and McCrea suggest that a 7 day waiting period can minimize the risk of recurrent injury. Same season repeat injuries usually occur in the 7 to 10 day window after the first concussion, supporting the concept that there may be increased neuronal vulnerability or blood-flow changes during that time.

*For athletes that have a history of 3 or more concussions and are experiencing slow recovery temporary or permanent disqualification from contact sports may be indicated.

CLASSIFICATION OF HEAD INJURIES:

The classical grading system of concussion in sports (i.e. Grade I, II, and III) is no longer in effect. A new classification consisting of Simple and Complex head injuries will now be used.

Simple

1. Symptoms resolve progressively w/o complications over 7-10 days
2. No physical activity while symptomatic

Complex

1. Persistent symptoms and/or reoccurring after restarting physical activity, or convulsion/seizures, or prolonged loss of consciousness (>1min)

RETURN TO PLAY CRITERIA:

Must follow sequence in order and cannot progress to the next level of the sequence until asymptomatic at the previous step. If an athlete experiences new symptoms or reoccurring symptoms, they must drop back to the previous step where they were asymptomatic and try to progress again after 24 hours.

1. No activity
2. Light aerobic activity (stationary bike, walking)
3. Sport specific exercises
4. Non-contact drills
5. Full contact after medical clearance
6. Return to game

Concussion Management

Concussions are common result of contact sports, fortunately, most athletes do recover fully when properly diagnosed and treated. However, if left undiagnosed or mistreated, concussion can lead to very serious consequences, including brain injury of even death. Occasionally, a blow to the head can tear a blood vessel in the skull. If the bleeding is slow, the signs and symptoms may not be apparent for 24 hours after initial injury. Therefore, it is important that you be watched closely over the next 48 hours. After reading this give it to a parent, roommate or whomever will be with you during the next 48 hours to observe you. You should not be alone.

The head injured patient needs to be watched carefully, and immediate action taken if any of the following symptoms occur:

- Decrease in level of consciousness
- Decrease or irregularity in respirations
- Decrease or irregularity in pulse
- Unequal, dilated, or unreactive pupils
- Changes in personality, irritability, or loss of memory
- Weakness in facial, arm, or leg muscles or loss of equilibrium (balance) and difficulty walking
- Seizures
- Nausea

If any of these symptoms occur, you should seek emergency care immediately. Calling 2911 on campus and 911 off campus will get an ambulance to respond to your location.

Also contact a member of the Athletic Training Staff:	**Office**	**Cell**
Dwayne Beam	349-2825	997-3618
Jeff Pounds	349-2725	421-4225
Barry Lippman	349-2887	421-1772
Andressa Martins	349-2823	421-9656

It is OK to:

- Take acetaminophen (Tylenol) for headaches
- Use ice packs on head/neck for comfort
- Go to sleep
- Rest

There is no need to:

- Check eyes with flashlight
- Wake up every hour
- Test reflexes
- Stay in bed

Do:

- Eat a well balanced nutritious diet
- Resume normal activities of daily living
- Go to class

Do Not:

- Drink Alcohol
- Take illicit drugs
- Eat spicy foods

Specific Recommendations:

Recommendations provided to:_____ Signature:_____

Recommendations provided by: _____ Date: _____ Time: _____

Signature of Certified Athletic Trainer:_____

Coastal Carolina University Sports Performance Concussion Management Plan

Obtain Baseline Testing: Symptom checklist and ImPACT testing data obtained for all student-athletes. High risk sports will obtain BESS baseline testing.

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Concussion Identified and Assessed: Physical examination and assessment of concussion symptoms by medical staff (athletic trainer and/or physician: if physician is not immediately available, athlete should be referred to physician for an evaluation within 24 hours of injury if not emergent; if emergent, athlete should be transported to closest emergency department); athlete held from all physical activity; given concussion information home instruction sheet; Athlete repeats baseline testing with symptoms checklist and ImPACT (48-72 hours of injury)

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Concussion Management: Athlete held from all physical activity; re-assess daily by medical staff; administer symptom checklist daily until completely asymptomatic; notify academic advisor (consideration of academic modifications/restrictions).

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Athlete Asymptomatic: Athlete repeats baseline testing with symptoms checklist, ImPACT, and BESS (unless directed otherwise by physician).

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Testing Results Return to Baseline:
Perform exertional testing; re-evaluation by physician for return to play decision

Testing Results NOT Returned to Baseline:
When medically cleared by physician, repeat test battery; consider further consultation with physician.

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When medically cleared by physician, repeat exertional testing; re-evaluation by physician for return to play decision.

Exertional Testing Protocol Following Concussion

Symptom checklist, ImPACT, and BESS testing WNL

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Exertional Testing Protocol

1. 10 min on stationary bike; exercise intensity < 70% maximum predicted heart rate.
2. 10 min continuous jogging on treadmill; exercise intensity < 70% maximum predicted heart rate.
3. Strength training: (i.e. push-ups, sit-ups, squat thrusts, etc.)
4. Advanced cardiovascular training: sprint activities
5. Advanced strength training: weight lifting exercises
6. Sports specific agility drills (no risk of contact)

If no change or increase in symptoms, move to next step

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Non-contact practice following completion of exertional protocol

If no change or increase in symptoms, move to next step

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Limited to full contact practice

If no change or increase in symptoms, final return to play decision made by medical staff

Coastal Carolina University
Concussion Daily Symptom Check-up

Day of Testing: **Baseline** **SRS: Day 1 2 3 4 5 6 7 ____**
SRA: Day 1 2 3 4 5 6 7 ____

Name_____ Date _____

Symptom Checklist: Circle "YES" if you have experienced the symptom within the last 24 hours or "NO" if you have not experienced the symptom over the last 24 hours.

1. Have you had a headache in the last 24 hours?	**YES / NO**
2. Have you experience nausea in the last 24 hours?	**YES / NO**
3. Have you had any difficulty balancing in the last 24 hours?	**YES / NO**
4. Have you experienced fatigue in the last 24 hours?	**YES / NO**
5. Have you experienced drowsiness in the last 24 hours?	**YES / NO**
6. Have you experienced sleep disturbances in the last 24 hours?	**YES / NO**
7. Have you had difficulty concentrating in the last 24 hours?	**YES / NO**
8. In the last 24 hours have you felt like you are "in a fog"?	**YES / NO**
9. In the last 24 hours have you felt "slowed down"?	**YES / NO**
10. Have your eyes been sensitive to light in the last 24 hours?	**YES / NO**
11. Have you felt sadness in the last 24 hours?	**YES / NO**
12. Have you experienced vomiting in the last 24 hours?	**YES / NO**
13. Have your ears been sensitive to noise in the last 24 hours?	**YES / NO**
14. Have you experienced nervousness in the last 24 hours?	**YES / NO**
15. Have you had difficulty remembering things in the last 24 hours?	**YES / NO**
16. Have you experienced numbness in the last 24 hours?	**YES / NO**
17. Have you experienced any tingling sensations in the last 24 hours?	**YES / NO**
18. Have you experienced dizziness in the last 24 hours?	**YES / NO**
19. Have you experienced any neck pain in the last 24 hours?	**YES / NO**
20. Have you been irritable in the last 24 hours?	**YES / NO**
21. Have you experienced feelings of depression in the last 24 hours?	**YES / NO**
22. Have you experienced blurred vision in the last 24 hours?	**YES / NO**