Return to Play after Sports Concussion

A guide from "A to Z"

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Belmont University Athletics

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Federation Equestrian Internationale (FEI)

Concussion in Sport Group

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Concussion Responsibilities of the ATC

- Knowledge – get as much as you can (current)
- Education – of all the other chain links
  - Creating a culture and establishing credibility
- Plan – have a concussion plan and *stick to it!*

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Comprehensive Concussion Plan

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Comprehensive Concussion Plan

- Defines goals, key personnel, groups to be served
- Discusses prevention and equipment
- Details baseline evaluations
- Delineates immediate management
- Identifies red flags for urgent medical evaluation or transfer to ER
- Determines follow up care
- RTP protocol

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Comprehensive Concussion Plan

- Defines goals, key personnel, groups to be served
  - Which teams will be covered and by whom?
- Discusses prevention and equipment
- Details baseline evaluations
- Delineates immediate management
- Identifies red flags for urgent medical evaluation or transfer to ER
- Determines follow up care
- RTP protocol

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Comprehensive Concussion Plan

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Comprehensive Concussion Plan

- Defines goals, key personnel, groups to be served
- Discusses prevention and equipment
- Details baseline evaluations
  - Minimum: neuro history, balance eval, neuropsych test
  - Every 2 years
  - At home tests are worthless!
- Delineates immediate management
- Identifies red flags for urgent medical evaluation or transfer to ER
- Determines follow up care
- RTP protocol

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Comprehensive Concussion Plan

- Defines goals, key personnel, groups to be served
- Discusses prevention and equipment
- Details baseline evaluations
- Delineates immediate management
  - Tools, record keeping treatment
- Identifies red flags for urgent medical evaluation or transfer to ER
- Determines follow up care
- RTP protocol

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Comprehensive Concussion Plan

- Defines goals, key personnel, groups to be served
- Discusses prevention and equipment
- Details baseline evaluations
- Delineates immediate management
- **Identifies red flags for urgent medical evaluation or transfer to ER**
  - Headaches that worsen * Looks very drowsy/ can't be awakened * Can't recognize people or places * Neck pain * Seizures * Repeated vomiting * Increasing confusion or irritability * Unusual behavioral change * Focal neurologic signs * Slurred speech * Weakness or numbness in arms/legs * Change in state of consciousness
- Determines follow up care
- RTP protocol

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Comprehensive Concussion Plan

- Defines goals, key personnel, groups to be served
- Discusses prevention and equipment
- Details baseline evaluations
- Delineates immediate management
- Identifies red flags for urgent medical evaluation or transfer to ER
- **Determines follow up care**
  - **Who and when**
- **RTP protocol**

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Concussion Plan

- Not a "rigid recipe" but rather a roadmap to a common destination
  - Allows for rest stops and sightseeing – individual flexibility!
- But not OK to just "wing it"!
  - Increases liability
  - Decreases credibility
- No need to reinvent the wheel

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Vanderbilt University Athletics
Mild Traumatic Brain Injury (mTBI)/Concussion Evaluation Guidelines

The following guidelines have been developed to aid Vanderbilt Sports Medicine staff in evaluation and identification of the student-athlete who has sustained a concussion/mTBI. The progression of a student-athlete with a diagnosed concussion/mTBI will include cognitive and physical exertion in a step-wise process for safe return to participation. These guidelines are a minimum standard of care, but allow the Sports medicine staff to manage concussions individually as the situation warrants (McCrory et al 2009).

Baseline Testing and Procedures

- Graded Symptom Checklist (GSC)(Piland 2003) *[Appendix A]*
- ImPACT® Baseline Neurocognitive Testing *[Appendix B]*
- Balance Error Scoring System (BESS)(Riemann & Guskiewicz 2000) *[Appendix C]*
- NCAA Educational Material for Student-Athletes *[Appendix D]*
- NCAA Educational Material Coaches *[Appendix E]*
- Concussion Acknowledgement and Signature Form *[Appendix F]*

Time of Injury

- Initial Evaluation-Concussion Injury Report Form *[Appendix G]*
  - Vitals (pulse, BP)
  - Cranial nerve assessment
  - Strength
  - Sensation
- Graded Symptom Checklist (GSC)
- Balance Error Scoring System (BESS)
- Educate the student-athlete on the importance of cognitive rest; which entails limiting or removing cell phone use/texting, video games/television, including academic work and classes (d'Hemecourt 2011; Kissick & Johnston 2005; Doolan et al 2012).

Recommendations

- If the student-athlete is diagnosed with a concussion, the student-athlete will be withheld from competition or practice and not return to activity for the remainder of that day (NCAA Executive Committee Policy April 2010).

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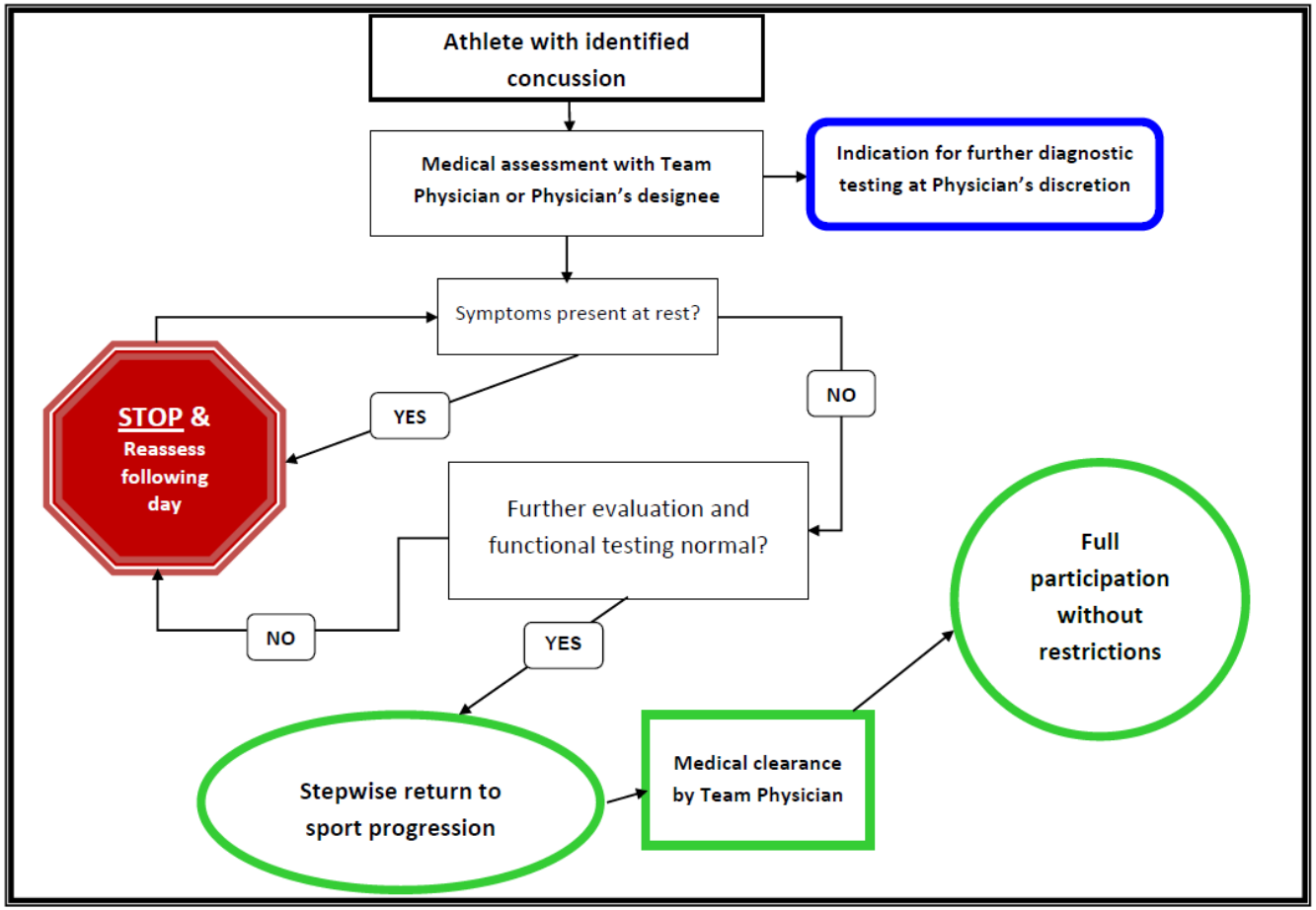
Protocol for Athlete with an Identified Concussion



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FAYETTEVILLE STATE UNIVERSITY BRONCOS

INTERCOLLEGIATE ATHLETICS CONCUSSION MANAGEMENT PLAN

I. PURPOSE

In an effort to better serve the healthcare needs of its student athletes, as well as to adhere to best practices recommended by the National Collegiate Athletic Association (NCAA), Fayetteville State University (FSU) has developed this comprehensive concussion management plan. The intent of this plan is to minimize the risk of permanent damage following a concussive injury to an FSU student athlete. The procedure and implementation of this plan should be well-known and practiced by FSU student athletes, coaches, certified athletic trainers, team physicians and all other athletic staff.

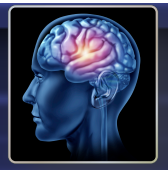
II. DEFINITIONS

A. Concussion

A concussion is a complex pathophysiological process affecting the brain that is induced by traumatic biomechanical forces. Several common features incorporate clinical, pathologic and biomechanical constructs of a concussive head injury. The following is a list of those common features:

1. A concussion 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.

2. A concussion typically results in the rapid onset of short-lived impairment or neurologic function that resolves spontaneously.



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Return to Play - goals

- Return athlete to play as soon as possible after brain injury has healed
- Emphasize actions and treatments that enhance and promote recovery
- Avoid actions and treatments that hinder recovery
- Return to play really begins as soon as concussion is diagnosed

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Same Day Return to Play

- Once *any* athlete at *any* age has been diagnosed with *any* concussion they are done for that day
  - No exceptions!
  - No such thing as a ding
  - No grading scale
  - Be aware that some injuries may evolve over time and symptoms may be delayed
  - Serial evaluations are helpful

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Pathways to Recovery

- 2 general "pathways" to recovery have been identified
  - Standard (80 – 90%)
    - all symptoms resolve in 7 to14 days
  - Prolonged (10 – 20%)
    - Symptoms for > 30 days
- This distinction appears over time and initial treatment principles are same

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Modifying Factors

Table 2: Concussion modifiers

Factors	Modifier
Symptoms	Number
	Duration (> 10 days)
	Severity
Signs	Prolonged LOC (> 1min), Amnesia
Sequelae	Concussive convulsions
Temporal	Frequency - repeated concussions over time
	Timing - injuries close together in time
	"Recency" - recent concussion or TBI

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Modifying Factors

Threshold	Repeated concussions occurring with progressively less impact force or slower recovery after each successive concussion.
Age	Child and adolescent (< 18 years old)
Co and Pre-morbidities	Migraine, depression or other mental health disorders, attention deficit hyperactivity disorder (ADHD), learning disabilities (LD), sleep disorders
Medication	Psychoactive drugs, anticoagulants
Behaviour	Dangerous style of play
Sport	High risk activity, contact and collision sport, high sporting level

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Acute treatment

- First 48 hrs
  - Physical AND cognitive rest
  - Avoid activities which elevate HR or BP
  - Avoid tasks which increase symptoms
    - "overstimulation" of brain
    - Simplify brain inputs
      - "live like the Andy Griffith show"
  - Some symptoms may evolve
    - esp. HA, concentration

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Acute treatment

- First 48 hrs
  - Encourage sleep
    - *Don't need the every hour wakeup*!
    - "excessive" sleep probably OK
  - School + / - depending on tolerance
    - Low threshold for absence – generally avoid until no symptoms for 24 hours
  - Meds – Tylenol, NSAIDs, occl nausea
  - Red flags – immediate referral for medical eval
  - ER physician CANNOT CLEAR FOR RETURN TO PLAY!!!

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After 48 hours

- Reassess with standard concussion tool
  - SCAT3 or similar
- NO role for ImPACT or BESS testing in this stage
  - May increase symptoms
  - Practice effect
  - Does not change plan
- Once asymptomatic for 24 hrs can return to class
  - If symptoms in class may need to modify schedule

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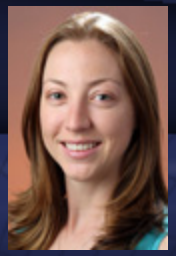
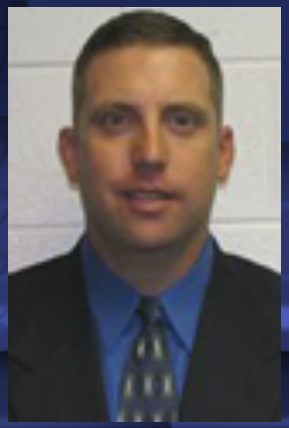






Return to play stages

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Return to Play - stages

- Phase “0” – cognitive exertion
- Phase 1 – aerobic exertion
- Phase 2 – functional testing progression
- Phase 3 – sport specific exertion
- Phase 4 – limited drills and non-contact practice
- Phase 5 – full participation without restrictions

From the
Vanderbilt University Athletics
Mild Traumatic Brain Injury (mTBI)/Concussion Evaluation Guidelines (2012)

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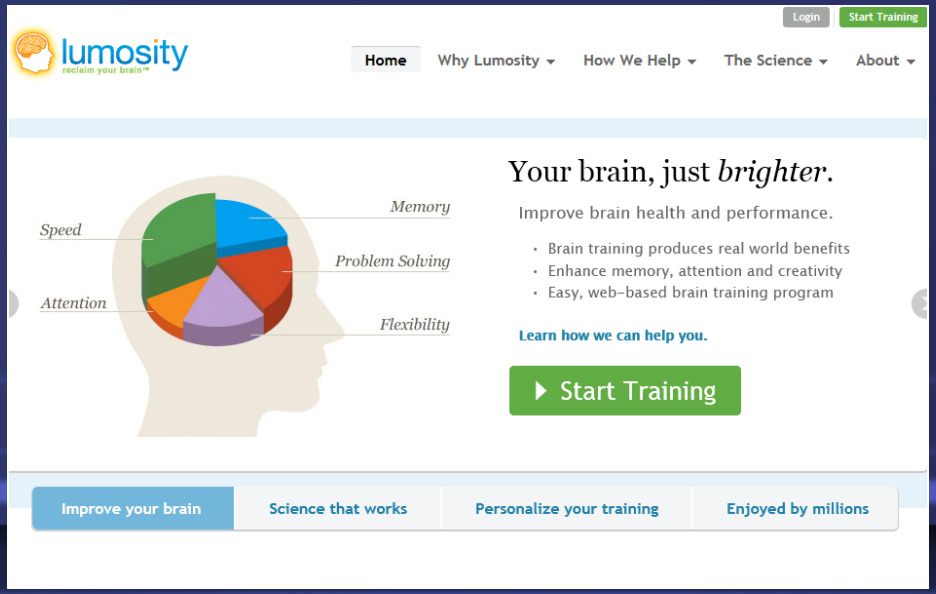
RTP Phase 0 – Cognitive Exertion

- No RTP until completion of full school day and all academic work with NO symptoms
- If no school – find other cognitive tasks
  - Reading for comprehension



Courtesy of Tracy Campbell, ATC

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RTP Phase 1 – Aerobic Exertion

- Graded Symptom Checklist (GSC)
- Functional exertion test
  - Bike 20 minutes @ 70 percent of predicted maximum heart rate(PMHR)
  - Rest for 15 minutes
  - Monitor symptoms
  - Incremental Treadmill Test 20 minutes (Leddy et al 2010)
- Stepwise return to sport progression will proceed to Phase 2 if student-athlete is asymptomatic at the current level. If any post concussive symptoms occur, reassess the following day and repeat the previous phase.

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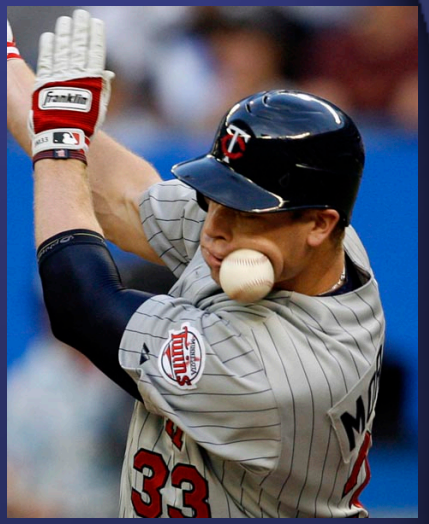
RTP Phase 2 – Functional Testing Progression

- Monitor symptoms
- Initial Functional Exertion
  - Scissor step/quick step
  - Jogs
  - lateral shuffle
  - Backpedal
- Sprints
- Advanced Functional Exertion
  - Sit-ups
  - Burpees
  - Push-ups
  - Sprints
  - Sprints w/ intermittent push-ups



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RTP Phase 2 – Functional Testing Progression

- Stepwise return to sport progression will proceed to Phase 3 if student-athlete is asymptomatic at the current level. If any post concussive symptoms occur, reassess the following day and repeat the previous phase.

- *Student athlete may begin limited lifting if asymptomatic depending on the sport requirements*

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RTP Phase 3 – Sport Specific Exertion

- ImPACT® follow-up test reviewed by team physician
- Monitor symptoms
- **Initial**
  - Moderate aerobic exercises specific to sport
  - Duration approximately 10- 15 minutes w/5 minutes rest post session
  - Monitor symptoms
  - Progression depends on student-athlete remaining asymptomatic
- **Intermediate**
  - Progressively difficult aerobic exercises specific to sport
  - Duration approximately 10- 15 minutes w/5 minutes rest post session
  - Monitor symptoms
  - Progression depends on student-athlete remaining asymptomatic
- **Advanced**
  - Demanding aerobic exercises specific to sport
  - Duration approximately 10- 15 minutes w/5 minutes rest post session
  - Monitor symptoms
  - Progression depends on student-athlete remaining asymptomatic

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RTP Phase 3 – Sport Specific Exertion Example

- SPORTS SPECIFIC EXERCISES - BASKETBALL
- Initial
  - 10 laps around floor—sprint straight away/slide baseline
  - Sprints full court
  - Start and stops
  - Backpedal
  - lateral Shuffle
  - Power skips
- Intermediate
  - Sprints
  - Defensive zigzag
  - Speed Hurdles
  - Square drill
  - Shooting/post drills—timed
- Advanced
  - Mican drill with weighted ball
  - Intervals 10 x 40 sec duration w/minute rest
    - Each interval contains various movements
    - Lateral shuffle
    - Sprints
    - Change of direction
    - Jumping
    - backpedal

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RTP Phase 4 – Return to Limited Drills and Non-contact Practice

- Monitor symptoms
- Non-contact training drills dependent upon sport
- Stepwise return to sport progression will proceed to Phase 5 if student-athlete is asymptomatic at the current level. If any post concussive symptoms occur, reassess the following day and repeat the previous phase.
- Consult team physician for full clearance

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RTP Phase 5 – Return to Full Participation without restrictions

- Graded Symptom Checklist (GSC)
- Full participation without restriction
- For collision sports will usually practice full speed with contact before game action (if available)

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RTP – How NOT to do it

- "We didn't let him practice all week and he feels good today (Thursday) so we're gonna let him play Friday night."
- "He rested for 3 days then I put him on the bike today for 15 minutes and he did fine so I let him go to practice today"
- "She felt bad all weekend but today she just has a slight headache and seemed ok in warmups so I let her go."

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RTP – "Pearls"

- When to repeat ImPACT?
- What if symptoms occur?
- Careful observation during and after final stage / first game back
  - EDUCATION of athlete!
- An extra few days in the RTP protocol might save your athlete a month, a season, or *even a whole school year!*

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