The Evolution of Sideline Concussion Assessment in the NFL

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Disclosures

• I have nothing to disclose
Outline

• Why this topic
• History of concussion management in the NFL
• Modifications to the concussion protocol and the scenarios that led to them
• Questions/comments
Why This Topic?

- Team physician since 2004
- CTE, lawsuit, media scrutiny
- Combination of medical expertise, public relations, teamwork, and use of technology
- NFL constantly refining
History

- NFL commissioner created MTBI committee in 1994
  - Elliot Pellman was chair (rheumatologist)
- Agent of Troy Aikmen and Steve Young had seminar in 1995
  - Definition of concussion was concerning
  - Merill Hoge retired because of concussions
- The American Academy of Neurology published RTP guidelines in 1997
  - Remove from the game if LOC, or with symptoms >15 min
History

• In 1999, Pellman stated majority of head injuries are “relatively uncommon and minor”
• May 2000, MTBI committee questioned Academy of Neurology RTP guidelines citing lack of evidence
  • Some player have LOC and do fine while others have minor trauma yet persistent symptoms
• Researchers Bailes and Jordan presented evidence that neurological problems are more likely if player had previous concussion
• Mike Webster claimed football gave him dementia
History

• In 2002, Bennett Omalu examined Mike Webster’s brain and discovered CTE
• In 2003, researchers cited prolonged recovery with multiple concussions and increased risk of concussion if player has had previous concussion
• Pellman allowed player to RTP after LOC
• In 2004, MTBI Committee stated 92% concussions able to RTP in 7 days
• In 2005 Terry Long committed suicide, CTE evident
• Dr. Omalu presented CTE finding in Journal of Neurosurgery in 2005
My Standard of Care in 2004

- Loss of consciousness OK for same day RTP
- Trying to quickly determine cognitive function in players with MTBI
- Mild concern over delayed recovery and multiple concussions
2007

• Bales research showed increased rate of depression in athletes with 3 or more concussions
  • Andre Waters (44) committed suicide, found with CTE, 2006

• NFL concussion summit in Chicago stated “we are managing these fine”
  • Pellman resigned as Chairman, replaced by Casson and Viano
  • Bales presented findings of dangers of concussions but the Committee dismissed them due to “poor science”
  • NFL releases pamphlet suggesting that problems can occur if MTBI is not managed correctly
2008 Consensus Statement, Vienna

- Simple and complex concussions
- Same day RTP may be appropriate for NFL players (younger players?)
- LOC >1 minute concerning
- No formal comment on CTE
2009

- More evidence of CTE
- Congressional Hearing
- Study revealed retired NFL players 19 times more likely to suffer from dementia
- MTBI Committee Chairs changed to Batjer and Ellenbogen
- December 2009, no RTP if had concussion
  - My life became much easier on sidelines
  - Symptom free and cleared by independent Neurologist
2010-2013

- More evidence of CTE
- Multiple former player suicides
- NFL changed kick-off to 35 yard line
- NFL players file lawsuit 2011
- ATC Spotter and Madden Rule 2011
- Heads Up Football 2012
- UNC starts in 2013, NFL pays $765 million to settle lawsuit
CONCUSSION GAME DAY CHECKLIST

Player receives impact to the head AND Player exhibits or reports symptoms or signs suggestive of a concussion or stinger OR ATC, booth ATC, team physician, NFL official, coach, teammate or UNC initiates protocol

Player is immediately removed to sideline or stabilized on field, as needed.

SIDELINE SURVEY
Removed helmet. Team Physician and UNC perform sideline survey:
- No-Go
- History of Event
- Concussion Signs/Symptoms
- Maddock's Questions
- Video Review
- Focused Neurological Exam:
  - Cervical Spine Exam (including range of motion, pain)
  - Evaluation of Speech
  - Observation of Gait
  - Eye Movements and Pupillary Exam

If normal sideline survey and "benign" video, player may RETURN TO PLAY.

No-Go
- LOC
- Confusion
- Amnesia
If observed at any point, NO RETURN TO PLAY
What Makes Sideline Management Difficult

- Time lapse between force to head and symptoms
- Players self report symptoms
- NFL is reassuring the NFLPA/public that we “are doing everything”
- We don’t know enough about CTE
- High Definition TV/replay plus commentators
2013

- Mandated and standardized for all teams
  - Compare to baseline, monitor recovery
  - iPad test
- Encouraged to collaborate with UNC
- One ATC Spotter worked with both teams
- Week 1 of NFL season Jeremy Kerley evaluated in locker room, OK’d RTP, later diagnosed with concussion
  - First round playoffs, 2 players RTP despite later being diagnosed as having concussion
  - Next season UNC must participate with every evaluation
Edelman Super Bowl

- Continued playing for the series and scored winning touchdown
- Observers say that medical staff asked him questions
- No concussion ever confirmed
- Public relations nightmare
Edelman Rule

• In Spring 2015, Owners approved “medical timeout”
• In response to Super Bowl 2015
• ATC Spotter could call down to sideline and stop game
• Later expanded timeout option to all medical personnel
Case Keenum, November 2015
Tie game, 2 minutes remaining
Case Keenum

- Head ATC asked and player responded “I feel OK”
  - Never had formal evaluation during run of play
- Diagnosed as a concussion after the game
- ATC Spotter thought the Head ATC was “taking care of it” and did not call time out
- Should have been removed from game and evaluated
- League wide conference call
- If teams do not institute protocol, they are subject to fines and loss of draft picks
  - Penalties increased for competitive advantage
Cam Newton, Opening Game 2016
Cam Newton

- First game 2016 season, multiple hits in 4th quarter
- The ATC Spotters suggested that medical staff should review plays
- Medical staff delayed review due to technical errors
- No signs of concussion, so no initiation of protocol
- Passed evaluation after the game
- Another league conference call changed the protocol: the Spotters must remain in contact with the medical personal until concussion evaluation has occurred
Matt Moore

- Was removed for one play (4 minutes)
- Defender penalized for illegal hit
- Team physician and UNC agreed on RTP
- Social media frenzy
- Was not found to have a concussion
- Team did not follow concussion protocol due to “bleeding from mouth”
Tom Savage, November 2017

- Big hit, seizure response not observed by medical staff
  - No super slow motion
- After 3 minute evaluation in tent, OK for RTP
  - Significant Twitter response
- Removed from the game later after symptoms appeared
- Diagnosed as having concussion
NFL Response to Tom Savage Concussion

• NFL added language about posturing, stumbling, and seizure response
  • Stumbling requires full evaluation in locker room
  • Seizure or posturing is automatic no-go
• Super slow motion video replay can now be seen in central location, but is still not available on sideline video replay
• Independent UNC can remove players
Thank You!