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A Comparative Content Analysis of Sports Concussions in News and Entertainment Print Media Publications in 2005 versus 2015

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A Comparative Content Analysis of Sports Concussion in News and Entertainment Print Media

Publications in 2005 versus 2015

Shayla Nicole Henrikson

A Thesis Submitted to the Graduate Faculty of

GRAND VALLEY STATE UNIVERSITY

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Abstract

This study examined four distinct areas of sports concussion as they are presented in the media; definitions/descriptions of concussion, informants for direct quotes about concussions, signs and symptoms, and duration of time missed from sport including removal from play. The study examined print media articles published in 2005 (n=64) and 2015 (n=136). Additionally, journal articles aligning with the research components were analyzed to provide a review of the scope of knowledge during each of the collection periods. Overall, the discussion of sports concussion in the media broadened between 2005 and 2015. There was more variety in the descriptions used, types of informants directly quoted, and signs and symptoms reported in the 2015 findings. Articles that reported less than three weeks of time missed from sports (prospective or retrospective) represented 31% (9/29) of the reports from 2005, and 62.07% (36/58) of the reports from 2015. The hypothesis that “signs would be reported more often than symptoms” was not supported by the findings from either collection period. The hypothesis that “the media would more frequently report extended periods of time missed from sport due to concussion and athletic careers ended because of concussion complications” was partially supported in the 2005 findings, but was not supported by the data from 2015.

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A Comparative Content Analysis of Sports Concussions in News and Entertainment Print Media
Publications in 2005 and 2015

Chapter 1

Problem Formulation

Research Questions

1. How does the media describe sports concussions?
2. How often do news or entertainment articles discuss signs or symptoms of sports concussions and which signs or symptoms are reported?
3. How does the media report return to play and recovery times for concussions sustained in sports?

Hypotheses

The hypotheses for this study are listed below:

1. The media will more frequently report concussion signs rather than symptoms.
2. The media will more frequently report on concussions that cause delayed or permanent removal from play.

Thesis Objectives

The main objective of this thesis was to analyze how sports concussions were discussed in print media in 2005 and 2015. Additionally, this thesis aims to address the previously stated research questions. Lastly, this research is descriptive and exploratory in nature so it is meant to be a stepping stone for future studies in the public health, medical, athletic, and journalism professions.

Chapter 2

Background

The Centers for Disease Control and Prevention (2003) reported that approximately 75% of traumatic brain injuries in the United States are concussions. Each year, there are an estimated 1.6-3.8 million concussions that result from sporting and recreational activities (Langlois, Rutland-Brown, & Wald, 2006). The burden is extremely prevalent in youth athletes, with reported findings that as many as one third have experienced an undiagnosed concussion (Meehan, Mannix, O'Brien & Collins, 2013). In response to this crisis, all 50 states and the District of Columbia have passed legislation addressing concussions in youth athletics, but there is great variance in the content and enforcement of these laws (Baugh, Kroshus, Bourlas, & Perry, 2014). Through a thorough concept analysis, Snedden (2013) constructed a comprehensive definition of concussions, indicating that it is

A complex, pathophysiological process that results from a traumatic bump, blow, or jolt to the head, or to the body with a force transmitted to the head causing simultaneous rotational acceleration of the brain. It results in the quick onset of short-term alterations in one or multiple domains (cognitive, physical, behavioral, and sleep) that may result in rare but severe and/or long-term effects (p. 215-216).

Symptoms can occur within minutes or hours following the injury, and include headache, dizziness, disorientation, vomiting, gait imbalances, blurred vision, brief loss of consciousness, stunned appearance, confusion, slow or disturbed speech, and emotional or behavioral changes (Centers for Disease Control and Prevention, 2003; Chadehumbe, 2016; Brown, Elsass, Miller, Reed, & Reneker, 2015). Sub-acute presentations of concussions (those that occur more than a few hours after the initial injury) can include “headache, dizziness, nausea, photosensitivity,

fatigue, self-limited vomiting, feeling mental slowness, trouble with memory (both anterograde and retrograde memory), trouble concentrating, sleep disturbances, and emotional changes” (Chadehumbe, 2016, p. 53). Functional limitations in activities of daily living, work, school, recreation, social situations, and financial independence can also be experienced during the sub-acute phase of a concussive injury (Centers for Disease Control and Prevention, 2003).

Recovery times from concussion can vary. Research suggests that more than half of high-school athletes are symptom free two weeks post injury (Williams, Puetz, Giza & Broglio, 2015; Harvey & Seabrook, 2016). College athletes generally experience shorter recovery rates; with estimates indicating most are symptom-free six days post-injury (Williams, Puetz, Giza & Broglio, 2015). Initial injury severity is believed to play a role in recovery time, with one study finding that 80% of concussions that were initially rated as mild (vs. moderate) on the TBI index resolved within 14 days (Prichep, McCrea, Barr, Powell, & Chabot, 2013).

One rare but severe complication that can occur when an athlete sustains a second concussion while still symptomatic from a previous concussion is Second Impact Syndrome (SIS) (Cantu & Gean, 2010). SIS has the potential to cause severe brain swelling and the development of a subdural hemorrhage leading to lifelong disability or death (Cantu & Gean, 2010). Long-term cognitive effects of concussions can be found in the research dating back to 1928 when boxers who sustained repeated blows to the head were noted to be impaired in comparison to the general population (Martland, 1928). In 2002, Dr. Bennet Omalu discovered significant neurodegeneration while performing an autopsy on the brain of a retired professional football player. Omalu described abnormal physical and cognitive degeneration resulting from repeated concussions or traumatic brain injury throughout the lifetime as Chronic Traumatic

Encephalopathy (CTE) (Omalu, 2004; Sivak, Nosal, Bittsansky, Dluha, Dobrota, & Kurca, 2016).

A number of reasons for an athlete not disclosing a possible concussion or concussion symptoms have been reported such as not believing that the injury was serious enough to report, not wanting to be removed from play, not knowing that the injury was a concussion, not wanting to disappoint teammates, not wanting to miss future games or practices, believing that a concussion is just a part of the game, and not wanting to let down coaches (Kerr et al., 2014). Kroshus, Kubzansky, Goldman, and Austin (2014) also found that a strong personal recognition with an athletic identity increased the likelihood that symptoms would not be reported, while preseason intention to report was positively correlated with actual reporting post-injury. Kroshus, Garnett, Baugh, and Calzo (2015) have previously suggested the possible benefits of applying social norms theory to concussion education given that misperceptions have often identified when evaluating reporting intention and behaviors. The Social Norms Approach holds that behaviors and attitudes are shaped by what individuals perceive to be normal, and that targeting gaps between perceived and actual norms can effectively be used to design and implement behavior-change interventions (Berkowitz, 2004).

Several studies have sought to evaluate concussion information published on the Internet and in the media. It has been found that 60% of concussion education materials available online failed to indicate the importance of evaluation by a medical professional for a suspected concussion (Ahmed, Sullivan, Schneiders, & McCrory, 2012). In a media content analysis of an National Hockey League (NHL) star's consecutive concussions, it was seen that in the months following the player's injuries the discussion progressed to include topics such as the benefits of rules to protect players and the psychological symptoms of concussions that can occur

(McGannon, Cunningham, & Schinke, 2013). Research has also noted that portrayal of concussions in sports broadcasting media is significant because of the influence that it can have on the public's perception of injury severity and maintenance (McLellan & McKinlay, 2011; Provvidenza et al., 2013). There are a variety of ways that the public views concussions in mass media and entertainment platforms. Ahmend, Sullivan, Schneiders, and McCrory (2012) noted that it is important for healthcare professionals to be aware of the information that their patients are exposed to on social media, especially given that the accuracy of such information is subject to question.

Given the significance of misperceptions about concussions held by athletes, and the influence of media on concussion perceptions, it is reasonable to suggest the importance of research exploring relationships between these factors. Hahn-Smith and Springer (2005) noted that

The central tenet of social norms theory is that correcting misperceptions is likely to result in decreased problem behavior and increased prevalence of healthy behaviors.

Extensive research has shown that peer influences are based more on what we think our peers believe and do (i.e., the perceived norm) than on their real beliefs and actions (i.e., the actual norm) (p. 2).

Applying this theory is potentially helpful in identifying gaps between how the media portrays sports concussions and how these injuries are experienced in actuality. A theory that could be applied to this discussion in a complimentary fashion is the agenda-setting theory, which "is concerned with explaining the extent to which the amount of media coverage of an issue has an impact upon the public's attention to, and interest in, that issue" (Agenda-Setting

Theory, 2010). A descriptive analysis of sports concussion in print media can be effectively guided by a hybrid of social norms theory and agenda setting theory.

As will be discussed in chapter 3, this study assessed data from 2005 and 2015 publications. There were a number of significant events that occurred between these two time points that can provide some insight as to why these were the years chosen for this study. In October of 2005, Guskiewicz and Bailes published findings that repetitive concussions in sports can result in dementia-related syndromes (Ezell, 2013). The Lystedt Law was passed by the state of Washington in May of 2009, which enacted protection for youth athletes by addressing return-to-play after suspected concussion (The Lystedt Law, n.d.). Later that year, in September of 2009, a study funded by the National Football League (NFL) reported that former professional football players were “19 times more likely than the general population to have dementia, Alzheimer’s or other memory-related diseases” (Ezell, 2013, n.p.). By December of 2009, a spokesperson for the NFL made the first public acknowledgement of the long-term implications of concussions (Ezell, 2013). In 2010, the National Collegiate Athletic Association (NCAA) adopts legislation that requires affiliate institutions to develop a concussion management plan (Concussion Timeline, n.d.). The enactment of the previously mentioned Lystedt Law was the first to address concussions in sports, and by 2015 all 50 states and Washington D.C. had adopted legislation addressing the topic in some way (Concannon, 2016). In late 2013, a book titled *League of Denial* was published (Wilner, 2016). Authored by two ESPN investigative reporters, the New York Times Bestseller dives into the dangers of sports concussions and the story of the NFL’s supposed cover-up of the risks of head injuries in football (League of Denial, 2016). The impact of the sports concussion controversy on athletes became apparent in the spring of 2015, when a professional football player announced his retirement after just one

season in the NFL. The player, Chris Borland, traded a six-figure salary and a seemingly glamorous athletic career for an internship and largely concerns about the consequences of brain injuries and CTE as the platform for his decision (Maske, 2016). While many athletes have retired due to complications from concussions sustained during sports, Chris Borland's decision to voluntarily end his football career over the risk of concussions after just one season earned him the nickname of "the most dangerous man in football" (Maske, 2016).

Chapter 3

Methodology

Search Parameters

Inclusion criteria for this study was that the media articles must have been published by ESPN The Magazine, Sports Illustrated, The New York Times, or a peer-reviewed scholarly journal. The second criteria for this study was that the articles must be published between January 1, 2005 and December 31, 2005 or between January 1, 2015 and December 31, 2015. The last inclusion criteria were that articles were found using the search term “concussion.” The exclusion criteria were articles that do not discuss concussive incidents and those that discuss severe TBI’s or other non-concussive head injuries. Articles were not included if they only mention an athlete with a concussion but do not have any of the other measureable characteristics being evaluated in the study (symptoms, definitions, or recovery time). Articles published in any language other than English were also excluded from the study.

Data Collection Tool

A worksheet developed by the researcher was used to evaluate each article in the study for the specific research factors being examined. Quantitatively, this study will be examining (a) the types and frequencies of signs/symptoms reported, (b) the recovery time reported, including removal from play following a suspected concussion and time missed from sport, and (c) sources of direct quotes on sports concussions within the articles. Qualitatively, this study evaluated concussion definitions and descriptions. The qualitative analysis of definitions examines both the whole description as well as broken down characteristics including common words and phrases.

Definition and/or Description.

This component of the evaluation collected both definitions and descriptions of concussion. Definition's include any explanation for what a concussion is within the article, while a description of a concussion often references the degree or quantity of the injury. For example, some concussions in the evaluation were described as "mild" or "severe." Definitions or descriptions of concussions or concussive events as stated by the author or quoted from an outside source are included in this criteria. Articles with no clear definition or description of concussion were marked as not applicable (N/A).

Sources of Information.

This component of the research collected information from direct quotes discussing sports concussions. The collected information included the name of the person being quoted, title, and an affiliating organization, team, or sport (whichever available information is most specific). This piece of the evaluation only analyzed direct quotes that discussed information related to concussions in sports. Examples of titles include athlete, former athlete, coach, physician, family member of player, etc. While examples of affiliating organizations include teams, leagues, or Universities. University affiliations are further identified as an athletic team or research department (if noted in the article). Not all direct quotes in each analyzed article were included in this piece of collection, as only those quotes directly relating to sports concussions were included. For the purpose of analysis, informants were identified by type and what level of organized athletics they were involved with:

Informant Type:

- Athlete (current or former)
- Coach

- Attorney
- Medical/scientific professional
- Spouse/family member of the athlete
- Administrative Personnel

Informant Athletic Affiliation:

- Professional
- College
- Other

Signs and Symptoms.

Given that one of the hypotheses for this research calls for a separation between concussion signs and concussion symptoms, the two items are collected as such in the evaluation. The Journal of the American Medical Association distinguishes between the two by saying that “a symptom is a manifestation of disease apparent to the patient himself, while a sign is a manifestation of disease that the physician perceives” (King, 1968, p. 1063). Signs are objective presentations of concussion, while symptoms are subjective. To make the distinction between signs and symptoms more applicable to concussions specifically, this research was also guided by the CDC’s symptom checklist (n.d.). According to this checklist, the signs of concussion include; appearing dazed or stunned; confused about events; repeating questions; answering questions slowly; unable to recall events prior to the hit, bump, or fall; unable to recall events after the hit, bump, or fall; showing behavior or personality changes; and forgetting a class schedule or assignments. The checklist also defines the symptoms of concussion as; headache or “pressure” in head; nausea or vomiting; balance problems or dizziness; fatigue or feeling tired; blurry or double vision; sensitivity to light; sensitivity to noise; numbness or

tingling; does not “feel right;” difficulty thinking clearly; difficulty concentrating; difficulty remembering; feeling more slowed down; feeling sluggish, hazy, foggy, or groggy; irritability; sadness; being more emotional than usual; and being nervous (Centers for Disease Control and Prevention, n.d.). As guided by the CDC symptom checklist and the previously stated difference between signs and symptoms, this research grouped concussion signs and symptoms as follows;

Signs:

- Loss of Consciousness
- Appearing Dazed or Stunned
- Vomiting
- Other

Symptoms:

- Headache (including Migraines)
- Dizziness
- Amnesia
- Nausea
- Sensitivity to Light
- Sensitivity to Sound
- Emotional Disturbance
- Cognitive Changes
- Other

Recovery Time.

There were many subcomponents of recovery time evaluated by this study. First, it quantitatively measured any confirmed or suspected athletic careers that have ended because of

concussion or post-concussion syndrome. The second component related to recovery time was the amount of playing time an athlete has missed due to concussion. Data for “missed time” was collected as it was printed in the article (e.g. X number of games or X number of months). This part of the study also evaluated if a player was removed from a practice or game following a concussion (Y, N, or N/A) and if that player was returned to play within the same game or practice (Y, N, or N/A).

Chapter 4

Results

Definitions and Descriptions

Scholarly Articles.

There was only one publication that fit the inclusion criteria for a scholarly article that aimed to define concussion in 2005. McCrory et al (2005) presented the *Summary and Agreement Statement of the Second International Conference on Concussion in Sport, Prague 2004*, which upheld the definition previously established in the international conference that had been held in Vienna the year prior. The definition presented in this summary agreement was as follows:

Sports concussion is defined as a complex patho-physiological process affecting the brain, induced by traumatic biomechanical forces. Several common features that incorporate clinical, pathological, and biomechanical injury constructs that may be utilized in defining the nature of a concussive head injury include: 1. Concussion may be caused either by a direct blow to the head, face, neck, or elsewhere on the body with an 'impulsive' force transmitted to the head. 2. Concussion typically results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously. 3. Concussion may result in neuropathological changes, but the acute clinical symptoms largely reflect a functional disturbance rather than structural injury. 4. Concussion results in a graded set of clinical syndromes that may or may not involve loss of consciousness (LOC). Resolution of the clinical and cognitive symptoms typically follows a sequential course. 5. Concussion is typically associated with grossly normal structural neuroimaging

studies. No changes were made to the definition by the Prague group beyond noting that, in some cases, post-concussive symptoms may be prolonged or persistent. (p. 29-30). There were no findings meeting inclusion criteria to define concussion in 2015 scholarly articles.

2005.

The most prevalent finding in this category was the description of a concussion's severity as mild or minor. There were 15 references of a concussive injury that was "mild," "minor," or "slight." There was only one article that recognized concussion as a brain injury, specifically using the academically accepted terminology of "mild traumatic brain injury: (Rubin & Jenner, 2005). Only two of the articles that were analyzed in this data set provided a definition of concussion. Both of these definitions referenced that concussions result from a hit to the head, which then led to further complications associated with the injury (Gray, 2005; Bakalar, 2005).

2015.

There were 42 descriptive terms and phrases reported in the 2015 media articles. Despite there being more than twice as many analyzed articles in 2015 as there were in 2005, only four reports described concussions as mild in nature. Some of the terms used to indicate these less-severe concussions besides "mild" were "minor" and "small" concussions. There were 14 articles that referred to concussions as head or brain injuries, including three that reported concussions as "mild traumatic brain injury." There were four articles that described concussions as plausible, using the terms "possible," "apparent," and "suspected." While eight of the descriptions reported concussions as "hits" or "blows" to the head, there were also three that used the slang terminology to refer to concussion as bell-ringers. There were two reports where concussions were described as "debilitating." In this data, five definitions of concussion were reported, the contents of which are reported in Appendix C.

Sources of Information

Media Articles.

Table 1

Sources of Information – 2005 and 2015

	<u>2005*</u>		<u>2015</u>	
No report	35		71	
Individuals Quoted ^a	49		136	
I. Informant Type:				
Athlete	27	55.1%	45	33.1%
Coach	10	20.4%	15	11.0%
Attorney	0	0.0%	15	11.0%
Medical/Scientific Professional	5	10.2%	30	22.1%
Spouse/family member of an athlete	1	2.0%	10	7.4%
Administrative Personnel	6	12.2%	17	12.5%
Other	0	0.0%	4	2.9%
II. Informant Athletic Affiliation				
Professional	41	83.7%	59	43.4%
College	4	8.2%	18	13.2%
Other	4	8.2%	59	43.4%

^a Total number of data points in all articles.

*Percentage totals do not add to 100 due to rounding.

Signs & Symptoms

Scholarly Articles.

There were eight publications collected that reported findings of signs and symptoms of concussion in each analysis timeframe (2005 and 2015). Collectively, the signs and symptoms of concussion reported by the scholarly articles included those addressed by this research; loss of consciousness, appearing dazed or stunned, vomiting, headache/migraine, dizziness, amnesia, nausea, sensitivity to light, sensitivity to sound, emotional disturbance, and cognitive changes. For all signs and symptoms reported in the scholarly articles see Appendix A.

Media Articles.

Table 2

Signs and Symptoms – 2005 and 2015

	<u>2005</u>		<u>2015*</u>	
No Report	42		96	
Signs and Symptoms Reported	41		134	
I. Signs	18	43.9%	32	23.9%
Loss of Consciousness	5	12.2%	13	9.7%
Dazed/Stunned	5	12.2%	4	3.0%
Vomiting	1	2.4%	3	2.2%
Other	7	17.1%	12	9.0%
II. Symptoms	23	56.1%	102	76.1%
Headache/Migraine	3	7.3%	23	17.2%
Dizziness	1	2.4%	12	9.0%
Nausea	0	0.0%	2	1.5%
Amnesia (retrograde or anterograde)	7	17.1%	7	5.2%
Light Sensitivity	0	0.0%	8	6.0%
Sensitivity to Noise	0	0.0%	4	3.0%
Emotional disturbance	2	4.9%	16	11.9%
Cognitive	0	0.0%	15	11.2%
Other	10	24.4%	15	11.2%

*Percentage totals do not add to 100 due to rounding.

Recovery Time

Scholarly Articles.

There were three articles analyzed from 2005 that addressed symptom duration. One study reported that 45% of subjects were still experiencing post-concussion symptoms at 12-month follow-up (Stalnacke, Bjornstig, Karlsson, & Sojka, 2005). Another reported that symptoms were still present in 74% of subjects at one-week post-injury, 48% at one-month post-injury, 29% at three months' post-injury, and 11% at 12 months' post-injury (Davies & McMillan, 2005). Lastly, a study by McCrea et al. (2005) reported that 80% of subjects showed symptom decrease within seven days.

Only one study analyzed from the 2005 scholarly articles addressed return to play and reported that nearly half of subjects returned to play immediately or rested and returned to play in the same game (Pellman, Viano, Casson, Arfken, & Feuer, 2005).

Four scholarly articles from 2015 assessed return to play. The findings of these articles reported that:

- Approximately 2/3 of subjects returned to play in less than one week (Yang, Peek-Asa, Covassin, & Torner, 2005).
- 8.8 +/- 3.3 days to return to full participation (Buckley, Burdette, & Kelly, 2005).
- Mean of 47.3 days to return to play (Moor, Eisenhauer, Killian, Proudfoot, Henriques, Gongeni, & Reeneker, 2005).
- 12-44 days to symptom resolve (Iadevaia, Roiger, & Zwart, 2015)

One study assessed responses from medical professionals to determine a standard consensus on a time frame for when standard concussion symptoms become qualified as post-concussion syndrome, the most reported response was that individuals presenting with symptoms for 1-3 months' post-injury would be considered to have post-concussion syndrome (Rose, Fischer, & Heyer, 2015).

Media Articles.

Table 3

Recovery Time – 2005 and 2015

	<u>2005*</u>	<u>2015</u>
I. Time Missed Due to Concussion		
No Report	37	81
Data Points Reported	29	57
< 3 weeks	9 31.0%	36 63.2%
3 weeks – 3 months	6 20.7%	6 10.5%
3 months – 1 year	9 31.0%	6 10.5%
> 1 year	5 17.2%	1 1.8%
Unknown	0 0.0%	8 14.0%
II. Career-ending Concussions		
No Report	49	124
Data Points Reported	25	21
Confirmed	14 56.0%	18 85.7%
Suspected	11 44.0%	3 14.3%
III. Removal From Play		
No Report	50	87
Incidents Reported	16	59
No	5 31.3%	19 32.2%
Yes	11 68.7%	40 67.8%
Returned same game/practice	0 0.0%	6 15.0%

*Percentage totals do not add to 100 due to rounding.

Chapter 5

Discussion

Definitions and Descriptions

Scholarly findings for research aiming to define concussion were scarce. The search produced few results for studies attempting to identify a consensus on the definition of concussion. However, these studies were in the form of literature reviews and meta-analyses and did not meet the criteria of this study, which looked for original investigations and determinations. Given the lack of findings for original studies, the researcher utilized organization definitions to substitute as controls. One publication from 2005 that was utilized for determining a definition of concussion that was standard during that year was a summary statement from the 2004 International Conference on Concussion in Sport, which noted that “sports concussion is defined as a complex patho-physiological process affecting the brain, induced by traumatic biomechanical forces” (McCrory et al, 2005, p. 29). The summary then described several other features of concussions to be understood with the definition including; that a concussion can occur as a result of an injury to the head or body; that concussions are not visible on diagnostic medical imaging; concussions may or may not involve a loss of consciousness; and that post-concussion symptoms may be prolonged or persistent (McCrory et al., 2005). As with the review of the 2005 scholarly articles, there were limited findings for the 2015 search for articles whose purpose was to determine a definition of concussion. None of the findings produced a novel definition of concussion within the parameters of the search criteria. The consensus definition of concussion based on the most recent International Conference on Concussion in sport reported that

Concussion is a brain injury and is defined as a complex pathophysiological process affecting the brain, induced by biomechanical forces. Several common features that incorporate clinical, pathologic and biomechanical injury constructs that may be utilised in defining the nature of a concussive head injury include: 1. Concussion may be caused either by a direct blow to the head, face, neck or elsewhere on the body with an ‘impulsive’ force transmitted to the head. 2. Concussion typically results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously. However, in some cases, symptoms and signs may evolve over a number of minutes to hours. 3. Concussion may result in neuropathological changes, but the acute clinical symptoms largely reflect a functional disturbance rather than a structural injury and, as such, no abnormality is seen on standard structural neuroimaging studies. 4. Concussion results in a graded set of clinical symptoms that may or may not involve loss of consciousness. Resolution of the clinical and cognitive symptoms typically follows a sequential course. However, it is important to note that in some cases symptoms may be prolonged (McCrory et al., 2013, p. 250-251).

This indicates that, from an academic perspective, concussions were generally defined the same way across the time span of this analysis.

In this research, there were more descriptive references to concussion than entire definitions, with only four definitions reported between both years in comparison to 63 descriptive terms and phrases. In 2005, descriptive terms most prevalently indicated a less-severe degree of injury. These terms included describing concussion as “mild,” “minor,” or “slight.” There was only one article that utilized the term “mild traumatic brain injury,” which has been the professionally accepted terminology for concussions across the time span of this analysis.

The Brain Injury Association of America (2015) notes that “the term ‘mild traumatic brain injury’ can be misleading. The term ‘mild’ is used in reference to the severity of the initial physical trauma that caused the injury. It does not indicate the severity of the consequences of the injury” (n.p.). The current study is relevant to this concern given that a number of articles from 2005 and 2015 described a concussive injury using some variation of the term “mild.”

When concussions are presented to readers as less-severe on a regular basis, this could influence subjective perceptions of the severity of concussion. This concern is further supported by the Agenda Setting Theory in the premise that how issues are portrayed can influence how the public understands them (Agenda Setting Theory, 2010). As it applies to how concussions are described by the media, the agenda setting theory would serve as a basis for further research to investigate how this relates to the public’s determination in describing concussions based on media presentation.

There was much more variance in the descriptions of concussions found in the study articles from 2015. As with the 2005 articles, many used terminology that described an injury as having a lesser degree of severity. A difference from the 2005 analysis was that there was an increase in informal phrases and slang that were used to describe concussive incidents. For example, several articles referred to concussion as a “blow” or “hit” to the head. Additionally, there were several articles in the 2015 analysis that identified concussions as a head or brain injury. There were also more articles in 2015 that used terminology indicating that the injury was severe. Some of the terms used for such descriptions included “severe,” “deep,” and “third-degree.” Given that descriptive terms indicating a severe injury were minimal in the 2005 findings, it can be suggested that between 2005 and 2015 the media began to acknowledge that the degree of severity for a concussive injury can vary from case to case. As discussed in the

literature review, research has shown that initial injury severity could impact recovery time (Prichep, McCrea, Barr, Powell, & Chabot, 2013). The increase in describing concussions by different levels of severity could be beneficial if it promotes understanding amongst the reading audience that each concussion is different.

Academic definitions of concussion have indicated that the injury can result from any mechanism of action that causes the brain to move within the skull (Snedden, 2013). While it shows promise that more articles in 2015 than 2005 identified concussion as head or brain injuries, there were no articles from 2005 identifying that concussions can also occur from hits to the body. As previously mentioned, this cause of concussion was known and acknowledged in the academic definition of concussion from 2005. Additionally, there were only two articles in 2015 that mentioned a non-head hit as a potential cause of concussion. These findings are worth consideration by public health professionals in the continued development of concussion education programs. Overall, these findings indicate that print media used descriptive terminology more so than structured definitions in the discussion of sports concussions. However, when definitions were presented, they were generally accurate when compared to more formal definitions.

Sources of Information

The second analysis grouping for this research looked at sources of information for direct quotes about concussions in the analyzed articles. The purpose of this research component was to understand who the print media is featuring when choosing to use direct quotes about sports concussions in an article. Although this component was not specifically mentioned in the hypotheses or research questions for this study, the findings serve as a supplemental point of discussion for the overall objective of the thesis. The most notable findings from this section of

the analysis are presented and evaluated further to enhance the overall conversation when answering the research questions.

One finding that was fairly consistent across the time trend was that the most common level of athletic affiliation of the informants was professional. Informants whose main affiliation was with a professional level of play represented 83.67% of informants in 2005, and 43.38% of informants in 2015. While these results are not surprising given the typical coverage of professional sports in news and entertainment media, their potential influence is certainly worth discussing within the objective of this thesis. This is especially true when considering that professional athletics influence lower levels of play at both the individual and organizational levels. At the individual level, younger athletes often look up to and idolize athletes playing at the professional level. A survey by The Kaiser Family Foundation (2000) reported that “children say that famous athletes rank second only to their parents . . . as the people they admire most” (p. 1). This influence of professional athletics on lower levels of play can also be organizational, as research “highlights the ‘trickle-down effect,’ where policies instituted and rules adopted at the professional and college levels influence those instituted and adopted for young athletes” (Wilson, 2010). Both the individual and organizational influences are relevant when analyzing the sources of information in a media article discussing concussions.

As previously mentioned, it has been shown that professional athletes serve as role models for many children (Kaiser Family Foundation, 2000). This association is relevant to the current study given that athletes were the most frequently quoted informant type in the analysis for both 2005 and 2015. Additionally, professional athletics was the most common affiliation type for individuals who were directly quoted in both collection periods. As a whole, this study aimed to look at how sports concussions are presented to the public through news and

entertainment print media. This component of the research more specifically shows the types of individuals whose words and thoughts are being presented using the printed articles as a medium. This is significant because the influence of mass media as explained by the Agenda Setting Theory could be enhanced when the information is coming directly from individuals that members of the audience feel a shared sense of identity with, as explained by the concepts discussed in Social Norms Theory.

Signs and Symptoms

The first hypothesis for this research was that more signs would be reported than symptoms. Overall, this hypothesis was not supported by the findings. In 2005, the findings showed 44% signs compared to 56% symptoms. When factoring out signs and symptoms that were categorized as “other,” symptoms still accounted for a larger percentage (57%) than signs (43%). In the results from the 2015 articles, symptoms accounted for an even larger percentage of the total report (76%) than signs (24%). When the 2015 results were recalculated without counting the signs and symptoms categorized as “other,” symptoms accounted for 81% and signs accounted for 19% of the report. Within the parameters defined by this study, news and entertainment print media reported more symptoms than signs when discussing sports concussions.

Review of the journal articles collected in this researched showed a general consensus in which signs and symptoms are clinically understood to be indicative of concussion and post-concussion. A difference that was noted across the time trend in this analysis, was that several studies in the 2015 collection period looked specifically at one or two symptoms and factors potentially associated with experiencing or recovering from the particular symptom(s) of focus in the study. The signs and symptoms identified by the scholarly article analysis in this study also

align with the structure of this study design in categorizing and reporting signs and symptoms from print media articles.

A theme seen across the time trend was an increase in the number of emotional and cognitive symptoms reported by the media in 2015 compared to 2005. In 2005, there were no cognitive symptoms reported compared with 15 reported in 2015. The findings were similar for symptoms categorized as “emotional disturbance”, of which there were two reported in 2005 and 16 reported in 2015. In 2015, emotional disturbance and cognitive symptoms were the second and third most frequently reported symptoms, respectively.

Emotional and cognitive symptoms were consistently present in the scholarly articles in 2005 and 2015 as well, with eleven of the studies included having reported or discussed them to some extent. Given this consistency, findings from the media articles could indicate that there has been an increase in awareness regarding these symptoms outside of the academic and medical professions. One 2009 study of parental awareness of concussion symptoms reported that increased emotion / irritability was the second most common concussion symptom that was not correctly identified by the respondents (Coughlin, Myles, & Howitt, 2009). Another previous study by McGannon, Cunningham, and Schinke (2013), which aimed to understand concussions in a socio-cultural context found that the discussion of concussions in sports media focused largely on “physical risks and symptomology with little, if any discussion of the psychosocial issues” (p. 898). When comparing these findings, which were collected in 2011, to the current study, there is further support for the indication that media articles are slowly making progress in including emotional and cognitive symptoms in their discussion of sports concussions.

Another point worth mentioning in examining the high number of symptoms reported in this research, is that certain symptoms such as headache, difficulty concentrating, nausea, fatigue, and trouble falling asleep have been reported in baseline testing (pre-injury) (Piland, Ferrara, Mcciocchi, Broglio, & Gould, 2010). The rate at which such symptoms occur in the non-concussed population could suggest that they are better understood by the public and are therefore more frequently referenced. The frequency of symptom report within this study showed similarities and differences when compared to the frequency of report in a truly concussed population. In a self-report assessment of concussion, headache was found to be the most reported concussion symptom (Meehan, O'Brien, Geminiani, & Mannix, 2016). This finding agrees with the research in the current study, which found that headaches were the most frequently reported symptom in 2015, and the second most frequently reported in 2005. One area where there was discourse between report in the media findings and actual presentation in a case of concussion was seen in the report of loss of consciousness. As previously mentioned, this sign only occurs in less than 10% of concussions. However, within this study, loss of consciousness was the second most reported out of all of the signs and symptoms in 2005, and was the fourth most frequently reported of all signs and symptoms in 2015. This finding is particularly supportive of the first hypothesis for this research. Although it is not the most frequently reported in the findings from 2005 or 2015, it is reported in the media more frequently than it would be expected to appear in a sample population of concussion cases. Historically, concussions were defined by the presence of loss of consciousness (Gasquoine, 1998). However, it is now reported that loss of consciousness occurs in less than 10% of concussion subjects (American Academy of Neurology, 2013). The frequency at which loss of consciousness has been reported in the current study, while not enough to support the hypothesis, does indicate that the media is still presenting

it as a common, rather than a rare, sign of concussion. The Agenda Setting Theory, as previously discussed, would suggest that the association between concussion and loss of consciousness as presented in the media could support previous findings that concussion is incorrectly associated with loss of consciousness. Future research could benefit from a further investigation of the presentation of loss of consciousness and its association with concussion in mass media.

Another finding worth discussing from this research was the significant number of signs and symptoms that needed to be categorized as “other.” While some of the data reported in the “other” category would likely be considered a true sign or symptom of concussion by some clinical standard, most were categorized as such because they were too ambiguous to be labeled as any of the predefined signs or symptoms of concussion. These unidentifiable signs and symptoms were slang words or other phrases that were clearly intended to describe symptomology of concussion. Examples include “blacking out,” various types of visual and auditory hallucinations, and various physical pains. There are still many misconceptions amongst the public about what is or is not a true sign or symptom of concussion. Acknowledging this finding of such ambiguity in the printed media articles is important for professional practice given the potential influence of such reports on the reading audience’s understanding of concussion signs and symptoms. However, from a health literacy perspective, the use of more informal language could potentially serve as a vector for increased concussion knowledge in members of the reading audience who may not be familiar with some of the more formal medical terminology associated with some signs and symptoms.

Recovery Time

The second hypothesis for this research was that the print media would more frequently report on concussions that cause extended removal from play, or that end an athlete’s career. For

this analysis, an extended period of time is considered more than three weeks missed from sport. This determination is based on typical recovery times as discussed in the literature review. Overall, hypothesis two was supported by the findings from 2005 but not 2015. In 2005, there were 20 reports of recovery times over three weeks, compared to nine that were less than three weeks. The findings from the 2005 scholarly articles analyzed showed ambiguity for recovery times from concussions. One study reported that 80% of concussion subjects showed symptom decrease within seven-days post-injury (McCrea et al., 2005). In contradiction, a study by Davies and McMillan (2005) found that 74% of subjects were still experiencing disability at seven-days post-injury. In regards to post concussion, one study found that 45% of subjects were still experiencing signs and symptoms of post-concussion one year after their injury (Stalnacke, Bjornstig, Karlsson, & Sojka, 2005). In contrast to the data collected from the 2005 media articles, there were only 13 reports (22%) in the 2015 media articles of injuries with a recovery period of greater than three weeks, compared to 36 reports (63%) of injuries where less than three weeks of play were missed. As with the 2005 scholarly articles, such ambiguity was also present in the findings from the 2015 scholarly articles. One study reported that most subjects returned to play in less than one week (Yang, Peek-Asa, Covassin, & Torner, 2015). In contrast, another study by Moor et al. (2015) reported a mean return to play time of 47.3 days. When considering reports from the scholarly findings regarding recovery time, the more frequent report of shorter return to play times in the 2015 media articles does not suggest that athletes in 2015 had shorter recovery times than athletes in 2005. Rather, there are a number of factors that could potentially explain why shorter periods of missed play were reported more frequently in 2015.

One possible reason for the increase in reporting of shorter time period missed in 2015 is the adoption and enforcement of return-to-play laws and regulations that occurred between 2005

and 2015. As stated in the literature review, all 50 states and Washington D.C. enacted legislation addressing concussion in youth sports during this time (Baugh, Kroshus, Bourlas, & Perry, 2014). Additionally, various college and professional athletic organizations and leagues have enacted their own policies and protocols. The National Collegiate Athletic Association (NCAA) adopted a concussion policy in 2010, covering approximately 450,000 college athletes (Baugh, Kroshus, Daneshvar, Filali, Hiscox, & Glantz, 2015). The National Football League most recently updated its concussion protocol in the summer of 2016 to promote enforcement of players being removed after sustaining a concussion (Belson, 2016). Findings from the current study could indicate that such protocols are being followed and that concussed athletes are being identified and held from play as a precaution. This presentation of adherence to concussion protocols is promising because it could mean that such standards are what the audience will come to expect as a normal response to possible concussions.

In the analysis of career-ending injuries, there was a small number reported in both 2005 and 2015. What was surprising from these findings was that there were actually fewer reports of athletic careers ending because of concussion in 2015 than in 2005, despite there being more than twice as many articles in the 2015 analysis. The low rate of report of athletic careers ending because of concussion would indicate that this component of the second hypothesis for this research is not supported by the findings of this study. However, it is worth noting that of the 2015 media articles that reported a suspected or confirmed career-ending injury, 100% focused on either the career of the athlete(s) whose career(s) had ended, or on the dangers of concussions in sports. This finding is relevant to the current study because although total report of career-ending concussions was a less frequent factor in comparison to the other research components, the articles that did contain such conditions were more focused and in-depth on the topic.

In the media 2005 articles, there were 16 data points that indicated whether or not a player was removed from play following a suspected concussion. Of these data points, 69% (n=11) were removed from play, while 31% (n=5) continued participation. There were no media reports of athletes who were removed from play but then returned to play in the same game or practice in 2005 (n=0). The analysis of scholarly articles reported that in one 2005 study of professional football players over six seasons, 49.5% of players who sustained a concussion were immediately or eventually returned to the same game or practice (Pellman et al., 2005). The authors of this study concluded that "the data thus suggest that, in the NFL environment, it may be safe for athletes who sustain MTBI to return to play on the same day if they become asymptomatic, have normal neurological examinations, and are cleared to return to play by their team physician" (Pellman et al, 2005). In comparison, there were 59 data points collected from the 2015 media articles that indicated whether or not a player was immediately removed following a suspected concussion. Of these data points, 68% (n=40) were removed immediately following a suspected concussion, while 32% (n=19) continued participation. Of the reports where an athlete was removed following a suspected concussion, 15% (n=6) returned to participation in the same game or practice. Return to play was not addressed by any of the scholarly articles analyzed for the 2015 analysis timeframe.

Chapter 6

Conclusion

In conclusion, the media uses more descriptive terminology to reference sports concussions than definitions. The descriptions used in 2005 were more consistent, and most often indicated that a concussion indicated that a concussion was mild in severity. In 2015, the descriptions used showed more variance than in 2005. The majority of the descriptions found in the 2015 data can be grouped into four major categories; mild concussions, severe concussions, head/brain injury, or hits/blows to the head. This research indicates that signs are not reported more frequently than symptoms in print media articles, and this finding was consistent across the time trend. However, further analysis revealed that loss of consciousness and amnesia, which are typically more severe but less common indications of concussion, were reported in the media at rates similar to headaches and dizziness, which occur more frequently in the concussed population. The findings from this study also showed that the media more frequently reported on extended time missed from sport due to concussion in 2005, but not in 2015. A prominent theme that emerged from this research was that individuals associated with professional athletics were the most common type of informant utilized by the media for direct quotes about concussions in 2005 and 2015. Analysis of the scholarly articles revealed that there are few to no studies that aimed to investigate a true definition of concussion. However, there was professional consensus on the key characteristics of concussions in both 2005 and 2015. This study provides an introduction to the investigation of how print media presents the topic of sports concussions, and how this portrayal evolved between 2005 and 2015.

Strengths and Limitations

A strength of this study is that it presents a fairly novel take on content analyses of concussions. Additionally, a strength of this study is the potential for ease in establishing reliability. A significant limitation to this study is that it is descriptive research and the findings are not generalizable on a larger scale. Future studies with similar designs and objectives could provide support for the present findings. Another limitation to this study is that it was entirely carried out by a single researcher. Although the researcher was academically and professionally prepared to conduct such research on the topic of sports concussions, the single subjective interpretations of qualitative data are a limitation nonetheless. A final limitation to this study is that the articles analyzed represent a relatively small sample when considering the vast amount of print media publications that discussed sports concussions in both 2005 and 2015.

Implications for Practice and Future Research

This research has presented that the assessment of sports concussion as discussed in print media articles is a topic worthy of consideration by those in the medical and public health professions. As research addressing concussion education and compliance with laws, policies, and protocols continues to develop, the way that these injuries are addressed by the media should be evaluated as a possible source of influence on athletes and their parents. Furthermore, continued analyses of media content that discusses sports concussions should aim to clarify what inconsistencies are repeatedly present. Medical and Public Health professionals could then seek to address these misrepresentations with the populations at risk for concussion through modifications to health education programs and injury management techniques.

Appendix A.

Article Citation	Year	Definition	Signs	Symptoms	Recovery Time
Chan, R. C. K. (2005). How severe should symptoms be before someone is said to be suffering from post-concussion syndrome? An exploratory study with self-reported checklist using Rasch analysis. <i>Brain Injury</i> , 19(13). 1117-1124. doi: 10.1080/026990500150088.	2005		vomiting	median of 5 minutes of post-traumatic amnesia, light sensitivity, restlessness, dizziness, sleep disturbances, irritability, nausea, forgetfulness, noise sensitivity, fatigue, poor concentration, blurred vision, fatigue, long time to think, headache, double vision, depressed/tearful, frustrated/impatience,	
McCrory, P., Johnston, K., Meeuwisse, W., Aubry, M., Cantu, R., Dvorak, J., Graf-Baumann, T., Kelly, J., Lovell, M., and Schamasch, P. (2005). Summary and agreement statement of the second international conference on concussion in sport, Prague 2004. <i>The Physician and Sports Medicine</i> , 33(4). 29-44.	2005	Utilized the definition from the Vienna conference which stated "Sports concussion is defined as a complex patho-physiological process affecting the brain, induced by traumatic biomechanical forces. Several common features that incorporate clinical, pathological, and biomechanical injury constructs that may be utilized in defining the nature of a concussive head injury include: 1. Concussion may be caused either by a direct blow to the head, face, neck, or elsewhere on the body with an 'impulsive' force transmitted to the head. 2. Concussion typically results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously. 3. Concussion may result in neuropathological changes, but the acute clinical symptoms largely reflect a functional disturbance rather than structural injury. 4. Concussion results in a graded set of clinical syndromes that may or may not involve loss of consciousness (LOC). Resolution of the clinical and cognitive symptoms typically follows a sequential course. 5. Concussion is typically associated with grossly normal structural neuroimaging studies. No changes were made to the definition by the Prague group beyond noting that, in some cases, post-concussive symptoms may be prolonged or persistent.	loss of consciousness (does not imply severity), vomiting, vacant stare, slurred speech, personality changes,	amnesia, cognitive factors, headache, dizziness, nausea, feeling "dinged" "foggy" or "dazed," visual problems (e.g. seeing stars or flashing lights, double vision), hearing problems (e.g., ringing in the ears), irritability or emotional changes, other symptoms such as a subjective feeling of slowness and fatigue in the setting of an impact, may indicate that a concussion has occurred or has not fully resolved	
Notebaert, A. J. & Guskiewicz, K. M. (2005). Current trends in athletic training practice for concussion assessment and management. <i>Journal of Athletic Training</i> , 40(4). 320-325.	2005		loss of consciousness,	retrograde amnesia, posttraumatic amnesia	
Pellman, E. J., Viano, D. C., Casson, I. R., Arfken, C., & Feuer, H. (2005). Concussion in professional football: Players returning to the same game - part 7. <i>Neurosurgery</i> , 56(1). 79-92.	2005			retrograde amnesia, anterograde amnesia, problems with information processing, attention, and immediate recall	"49.5% returned immediately or rested and returned to the same game." "The data thus suggest that, in the NFL environment, it may be safe for athletes who sustain MTBI to return to play on the same day if they become asymptomatic, have normal neurological examinations, and are cleared to return to play by their team physician."

Delaney, J. S., Abuzeyad, F., Correa, J. A. & Foxford, R. (2005). Recognition and characteristics of concussions in the emergency department population. <i>The Journal of Emergency Medicine</i> , 29(2). 189-197. doi: 10.1016/j.jemermed.2005.01.020	2005		Loss of consciousness	headache, confusion, dizziness, memory, blurred vision, nausea,	
Hall, R. C. W., Hall, R. C. W. & Chapman, M. J. (2005). Definition, diagnosis, and forensic implications of postconcussional syndrome. <i>Psychosomatics</i> , 46(3). 195-202.	2005			Headaches (including migraine), dizziness, blurred vision, sensitivity to light and noise, personality change, irritability, anxiety, and/or depression, inability to concentrate, inability to process information, word-finding difficulties, inability to integrate thought processes, verbal and nonverbal memory impairment.	
McCrea, M., Barr, W. B., Guskiewicz K., Randolph, C., Marshall, S. W., Cantu, R. . . . Kelly, J. P. (2005). Standard regression-based methods for measuring recovery after sport-related concussion. <i>Journal of the International Neuropsychological Society</i> , 11. 58-69.	2005		loss of consciousness	posttraumatic amnesia	80% showed symptom decrease within seven days
Davies, R. & McMillan, T. M. (2005). Opinion about post-concussion syndrome in health professionals. <i>Brain Injury</i> , 19(11). 941-947.	2005				persisting disability expected in 74% of cases at one week, 48% at one month, 29% at three months, 18% at six months, and 11% at 12 months.
Stalnacke, B. M., Bjornstig, U., Karlsson, K. & Sojka, P. (2005). One-year follow-up of mild traumatic brain injury: post-concussion symptoms, disabilities and life satisfaction in relation to serum levels of S-100B and neurone-specific enolase in acute phase. <i>Journal of Rehabilitation Medicine</i> , 37. 300-305. doi: 10.1080/16501970510032910	2005		loss of consciousness.	dizziness, nausea/vomiting, headache, fatigue, light sensitivity, double vision, pain, depression, bad concentration, noise sensibility, anterograde amnesia	45% still experiencing post concussion symptoms at 12 month follow-up.
Yang, J., Peek-Asa, C., Covassin, T. & Torner, J. C. (2015). Post-concussion symptoms of depression and anxiety in division I collegiate athletes. <i>Developmental Neuropsychology</i> , 40(1). 18-23. doi: 10.1080/87565641.2014.973499	2015			depression, anxiety	about 2/3 returned to play in less than one week
Buckley, T. A., Burdette, G. & Kelly, K. (2015). Concussion-management practice patterns of National Collegiate Athletic Association division II & III athletic trainers: how the other half lives. <i>Journal of Athletic Training</i> , 50(8). 879-888. doi: 10.4085/1062-6050-50.7.04	2015				time between injury and full unrestricted participation was 8.8 +/- 3.3 days.
Lynch, J. M., Anderson, M., Benton, B. & Green, S. S. (2015). The gaming of concussions: a unique intervention in postconcussion syndrome. <i>Journal of Athletic Training</i> , 50(3). 270-276. doi: 10.4085/1062-6050-49.3.78	2015			visual changes,	
Moor, H. M., Eisenhauer, R. C., Killian, K. D., Proudfoot, N., Henriques, A. A., Congeni, A. A. & Reneker, J. C. (2015). The relationship between adherence behaviors and recovery time in adolescents after sports-related concussion: an observational study. <i>International Journal of Sports Physical Therapy</i> , 10(2). 225-233.	2015				mean 47.3 days to return to play

Vargas, G., Rabinowitz, A., Meyer, J. & Arnett, P. A. (2015). Predictors and prevalence of postconcussion depression symptoms in collegiate athletes. <i>Journal of Athletic Training</i> , 50(3). 250-255.	2015			depression	
Joyce, A. S., Labella, C. R., Carl, R. L., Lai, J., & Zelko, F. A. (2015) The postconcussion symptom scale: utility of a three-factor structure. <i>Medicine and Science in Sports and Exercise</i> , 47(6). 1119-1123. doi: 10.1249/MSS.0000000000000534	2015		vomiting	dizziness, drowsiness, numbness or tingling, difficulty concentrating, feeling "in a fog," difficulty remembering, feeling slowed down, headache, nausea, sleep more than usual, sensitivity to light, sensitivity to noise, trouble falling asleep, irritability, nervousness, sadness, more emotional than usual	
Howell, D. R., Osternig, L. R., & Chou, L. (2015). Adolescents demonstrate greater gait balance control deficits after concussion than young adults. <i>The American Journal of Sports Medicine</i> , 43(3). 625-632. doi 10.1177/0363546514560994	2015		gait balance control		
Iadevaia, C., Roiger, T., & Zwart, M. B. (2015). Qualitative examination of adolescent health-related quality of life at 1 year postconcussion. <i>Journal of Athletic Training</i> , 50(11). 1182-1189. doi: 10.4085/1062-6050-50.11.02	2015			headaches most commonly reported physical symptom, also nausea, dizziness, sensitivity to light, sensitivity to sound, decreased reaction time, balance deficits, blurry vision, trouble sleeping, forgetfulness, difficult concentrating, confusion, anger or frustration, emotional or upset, irritability, anxiety, nervousness, school difficulties - were grouped as "significant effect of symptoms" "feelings of frustration," influence on school attendance and activities," and "nature of interpersonal and team relationships"	12-44 days
Register-Mihalik, J. K., De Maio, V. J., Tibbo-Valeriote, H. L., and Wooten, J. D. (2015). Characteristics of pediatric and adolescent concussion clinic patients with postconcussion amnesia. <i>Clinical Journal of Sports Medicine</i> , 25(6). 502-508.	2015		loss of consciousness	amnesia - more likely if also experienced a loss of consciousness. "amnesia may identify patients with a greater injury burden who warrant closer observation and more conservative management" - 507.	
Meyer, J. E. and Arnett, P. A. (2015). Changes in symptoms in concussed and non-concussed athletes following neuropsychological assessment. <i>Developmental Neuropsychology</i> , 40(1). 24-28. doi: 10.1080/87565641.2014.1001065	2015			More symptoms reported at baseline from exertion, but still less symptom report than resulting from a concussive injury.	
Ransom, D. M., Vaughan, C. G., Pratson, L., Sady, M. D., McGill, C. A., & Gioia, G. A. (2015). Academic effects of concussion in children and adolescents. <i>Pediatrics</i> , 135(8). 1043-1050. doi: 10.1542/peds.2014-3434	2015			academic learning and performance <- associated with greater symptom severity (per self or parent report) "severity of concussion symptoms was directly related to the extent of school-related effects experienced by students at all grade levels, regardless of the length of time since injury.	
Rose, S. C., Fischer, A. N., & Heyer, G. L. (2015). How long is too long? The lack of consensus regarding the post-concussion syndrome diagnosis. <i>Brain Injury</i> , 29(7-8). 798-803. doi: 10.3109/02699052.2015.1004756	2015				Most professionals surveyed said that patients experiencing concussion symptoms would be qualifying for a PCS diagnosis if the symptoms persisted 1-3 months. - overall lack of consensus on when the diagnosis should occur.

Appendix B.

Article Citation	Definition/ Description of concussion	Sources of information in the article			Signs and Symptoms		Recovery Time			
		Name of the person(s) being quoted/referenced about concussion.	What is their title? (player, coach, physician, researcher, etc.)	Are they affiliated with a specific organization? (league, team, etc.)	Signs:	Symptoms:	Mention of confirmed or suspected career-ending concussive injury? (Y/N) indicate suspected or confirmed	Length of time an athlete has missed due to concussion	Was an athlete removed from play following a suspected concussion ? (Y/N)	If yes, were they returned to play within the same game or practice? (Y/N)
Bakalar, N. (2005, October 18). Sports medicine: bad news for players hit in the head too often. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/10/18/health/sports-medicine-bad-news-for-players-hit-in-the-head-too-often.html	"Severe blows to the head" "an injury to the head that resulted in altered mental status and at least one of 12 different physical symptoms"	Dr. Stephen W. Marshall	Co-author of research study being discussed in the article. Associate Professor at UNC	University of North Carolina	N/A	N/A	N	N/A	N/A	N/A
Abramson, M. (2005, November 7). Fighter back in Queens, nursing concussion. <i>The New York Times</i> . Retrieved from http://query.nytimes.com/gst/fullpage.html?res=9C06E1D9143EF934A35752C1A9639C8B63	N/A	Lou DiBella, Nirmal Lorick	Boxers promoted (DiBella) & Trainer (Lorick)	DiBella Entertainment	Loss of consciousness (LOC)	N/A	N	Will miss at least 90 days as a result of being knocked out (Oklahoma Boxing Commission policy) (3 months - 1 year)	Y	N
Bechtel, M. (2005, November 14). Grounded Jet. <i>Sports Illustrated</i> . Retrieved from http://www.si.com/vault/2005/11/14/8361381/grounded-jet	N/A	Wayne Chrebet, Vinny Testaverde, Herman Edwards	Athlete, Athlete, Coach	New York Jets	N/A	N/A	Y, suspected	The remainder of the season (3 months - 1 year)	N/A	N/A
Anderson, D. (2005, November 7). Chrebet Has His Legacy. He Should Take It Home. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/11/07/sports/football/chrebet-has-his-legacy-he-should-take-it-home.html	N/A	Herman Edwards	Coach	New York Jets	Slow moving (other)	headaches (headache/migraine)	Y, suspected	N/A	Y	N

The New York Times. (2005, July 21). Hopkins appeals split decision. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/07/21/sports/othersports/hopkins-appeals-split-decision.html	N/A	N/A	N/A	N/A	N/A	N/A	N	July-December, 5-6 months (3 months - 1 year)	N/A	N/A
Abraham's status downgraded. (2005, January 8). The New York Times. Retrieved from http://www.nytimes.com/2005/01/08/sports/football/abrahams-status-downgraded.html	"sustained a mild concussion"	N/A	N/A	N/A	N/A	N/A	N	"half of 2003" (3 months - 1 year)	N/A	N/A
Crouse, K. (2005, November 8). For Jets, hopes and two careers are near an end. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/11/08/sports/football/for-jets-hopes-and-two-careers-are-near-an-end.html?_r=0	N/A	Vinny Testaverde, Wayne Chrebet, Al Toon	Player, Player, Former player	New York Jets	Legs stiffened (other)	N/A	Y, Y, Y - 1 suspected 2 confirmed	The remainder of the season (3 months - 1 year)	N/A	N/A
Diamos, J. (2005, August 9). N.H.L. reinstates Canucks' Bertuzzi. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/08/09/sports/hockey/nhl-reinstates-canucks-bertuzzi.html	N/A	N/A	N/A	N/A	N/A	N/A	Y, suspected - Moore may never be able to resume N.H.L. career because of the hit from Bertuzzi	17 months and ongoing (greater than 1 year)	N/A	N/A
Anderson, D. (2005, January 3). Chrebet makes an early exit, perhaps never to return. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/01/03/sports/football/chrebet-makes-an-early-exit-perhaps-never-to-return.html	"mild concussion"	Wayne Chrebet, Jericho Cotchery, Herman Edwards, Ron Colangelo, Dr. Elliot Pellman, Doug Miller, Terry Bradway, Chris Baker	Player, Player, Coach, VP Public Relations, Medical Chairman, Director of Media Relations, General Manager, Player	New York Jets	N/A	mild headache (headache/migraine)	Y, Y, Y, Y, Y, Y, Y, 6 confirmed, 1 suspected.	second half of last season (3 months - 1 year)	Y	N

Jones, R. L. (2005, January 6). Jets unsure if Abraham and Chrebet can meet Chargers. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/01/06/sports/football/jets-unsure-if-abraham-and-chrebet-can-meet-chargers.html	"mild concussion"	Herman Edwards	Coach,	New York Jets	N/A	N/A	N	N/A	N/A	N/A
Crouse, K. (2005, December 23). His career is over, but Chrebet still needs football in his life. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/12/23/sports/football/his-career-is-over-but-chrebet-still-needs-football-in-his.html	N/A	Wayne Chrebet	Player	New York Jets	vacant stare (dazed/stunned)	seeing a white light (other), hearing voices (other)	Y, confirmed	half of a season (3 months - 1 year)	N/A	N/A
Diamos, J. (2005, December 14). Rangers almost measure up with Canucks. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/12/14/sports/hockey/rangers-almost-measure-up-with-canucks.html	N/A	N/A	N/A	N/A	N/A	N/A	N	"has not returned since" - regarding a concussion sustained 20 months prior (greater than 1 year)	N/A	N/A
Sports Briefing. (2005, September 9). <i>The New York Times</i> . Retrieved from http://query.nytimes.com/gst/fullpage.html?res=9404E7DB1331F93AA3575AC0A9639C8B63	"mild concussion"	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A
Finley, B. (2005, February 10). Rutgers wins and preps for Connecticut. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/02/10/sports/ncaabasketball/rutgers-wins-and-preps-for-connecticut.html	N/A	N/A	N/A	N/A	N/A	N/A	N	"two games" (less than 3 weeks)	N/A	N/A
Kepner, T. (2005, April 12). Baseball: Yankees notebook; Rivera develops a fan base in Boston. <i>The New York Times</i> . Retrieved from http://query.nytimes.com/gst/fullpage.html?res=9C01E0DA123EF931A25757C0A9639C8B63	"mild concussion"	Carl Pavano	Player	New York Yankees	N/A	feeling like ears should pop (other), minor soreness (other)	N	N/A	Y	N

Finley, B. (2005, February 4). UConn women's team still has Rutgers number. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/02/04/sports/ncaabasketball/uconn-womens-team-still-has-rutgers-number.html	N/A	N/A	N/A	N/A	N/A	N/A	N	"since Saturday" five days (less than 3 weeks)	N/A	N/A
Caldwell, D. (2005, July 15). Facing a hectic future, Devils reach into their past. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/07/15/sports/hockey/facing-a-hectic-future-devils-reach-into-their-past.html	N/A	N/A	N/A	N/A	N/A	N/A	Y, suspected	"since Jan 7, 2004" - 18 months (greater than 1 year)	N/A	N/A
Picker, D. (2005, September 14). Hurting from a beanball, Piazza's been there before. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/09/14/sports/baseball/hurting-from-a-beanball-piazas-been-there-before.html	"mild concussion"	Mike Piazza	Player	New York Mets	"lay flat on his back after he was hit" (other)	memory loss (amnesia)	N	3 days (less than 3 weeks)	Y	N
Crouse, K. (2005, November 28). As Martin reaches milestones, Jets cannot reach a Millstone. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/11/28/sports/football/as-martin-reaches-milestones-jets-cannot-shake-a-millstone.html	N/A	N/A	N/A	N/A	N/A	N/A	N	"lost for the season" - another player missed one game and returned (3 months - 1 year) (less than 3 weeks)	Y	N
Eligon, J. (2005, September 15). Flat-lining Mets are in contention for irrelevance. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/09/15/sports/baseball/flat-lining-mets-are-in-contention-for-irrelevance.html	"mild concussion"	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A

Shpigel, B. (2005, September 12). Martinez helps Mets end six-game skid. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/09/12/sports/baseball/martinez-helps-mets-end-sixgame-skid.html	"minor concussion"	N/A	N/A	N/A	N/A	N/A	N	one game (two days) (less than 3 weeks)	N/A	N/A
Longman, J. (2005, March 20). UConn's Turner battles injuries and expectations. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/03/20/sports/sportsspecial/uconnns-turner-battles-injuries-and-expectations.html	"a blow to the head that became a concussion"	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A
Eskenazi, G. (2005, January 5). Cotchery still eager to show his speed. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/01/05/sports/football/cotchery-still-eager-to-show-his-speed.html	"mild concussion"	Herman Edwards	Coach	New York Jets	N/A	N/A	N	N/A	N/A	N/A
Crouse, K. (2005, November 11). Jets' next opponent knows what to do in red zone. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/11/11/sports/football/jets-next-opponent-knows-what-to-do-in-red-zone.html	N/A	Laveranues Coles	Player (teammate of concussed player)	New York Jets	N/A	N/A	Y, suspected	N/A	N/A	N/A
Crouse, K. (2005, September 13). No shortage of blame on the Jets. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/09/13/sports/football/no-shortage-of-blame-on-the-jets.html	"a third-degree concussion"	Kevin Mawae	Player	New York Jets	N/A	N/A	N	N/A	N/A	N/A
Branch, J. (2005, November 11). Giants' Finn is the anonymous blocking back. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/11/11/sports/football/giants-finn-is-the-anonymous-blocking-back.html	"whatever you call getting knocked silly for a few minutes"	Jim Finn	Player	New York Giants	"looking like someone had turned his lights off inside" (dazed/stunned)	"getting knocked silly" (other)	N	N/A	N/A	N/A

Lapointe, J. (2005, September 21). Indians got it together when Hafner returned. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/09/21/sports/baseball/indians-got-it-together-when-hafner-returned.html	N/A	N/A	N/A	N/A	N/A	N/A	N	17 games (3 weeks - 3 months)	N/A	N/A
Jenkins, L. (2005, April 11). Addled Pavano and shaky Yankees head to Boston. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/04/11/sports/baseball/addled-pavano-and-shaky-yankees-head-to-boston.html	"mild concussion"	Joe Torre	Manager	New York Yankees	"wobbly" (other) moving slowly (other), he was stunned (dazed/stunned)	"woozy" (other)	N	N/A	Y	N
Zinser, L. (2005, November 19). Luge champ is favored, but feels heat of hometown expectations. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/11/19/sports/othersports/luge-champ-is-favored-but-feels-heat-of-hometown.html	N/A	N/A	N/A	N/A	N/A	N/A	N	singles competition and doubles competition (for luge) (less than 3 weeks)	N/A	N/A
Shpigel, B. (2005, September 11). Piazza is beamed in his first game back in lineup. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/09/11/sports/baseball/piazza-is-beamed-in-his-first-game-back-in-lineup.html	"slight concussion"	MIKE Piazza	Player	New York Mets	"crumbled to the ground and lay there for a few minutes" (other)	"a little loopy" (other)	N	N/A	Y	N
Zinser, L. (2005, November 20). American luger sees the Olympics and the Germans. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/11/20/sports/othersports/american-luger-sees-the-olympics-and-the-germans.html	N/A	N/A	N/A	N/A	N/A	N/A	N	a race (less than 3 weeks)	N/A	N/A

Diamos, J. (2005, May 25). Spurs are heading home with a commanding lead. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/05/25/sports/basketball/spurs-are-heading-home-with-a-commanding-lead.html	"mild concussion"	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A
Caldwell, D. (2005, November 27). Situation wanted: driver, fast car required. <i>The New York Times</i> . Retrieved from http://query.nytimes.com/gst/fullpage.html?res=9406E1D61731F934A15752C1A9639C8B63	N/A	N/A	N/A	N/A	N/A	affected speech (other), affected eyesight (other)	N	six months (3 months - 1 year)	N/A	N/A
Diamos, J. (2005, December 13). Moore knows role, and avenger isn't it. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/12/13/sports/hockey/moore-knows-role-and-avenger-isnt-it.html	N/A	Dominic Moore	Player	New York Rangers	N/A	N/A	N	21 months and counting (greater than 1 year)	N/A	N/A
Crouse, K. (2005, November 15). Edwards and Jets not ready to give up. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/11/15/sports/football/edwards-and-jets-not-ready-to-give-up.html	N/A	Herman Edwards	Coach	New York Jets	N/A	N/A	Y, suspected	two weeks (less than 3 weeks)	N/A	N/A
Anderson, D. (2005, February 3). Talking tough rarely gets the job done. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/02/03/sports/talking-tough-rarely-gets-the-job-done.html	N/A	Cliff Harris, Lynn Swann	Player, Player	Dallas Cowboys, Pittsburgh Steelers	N/A	N/A	N	N/A	N/A	N/A
Zinser, L. (2005, December 9). Short-track speed skaters face trials to make team. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/12/09/sports/othersports/shorttrack-speedskaters-	N/A	N/A	N/A	N/A	N/A	N/A	N	two races (less than 3 weeks)	N/A	N/A

face-trials-to-make-team.html										
Battista, J. (2005, December 12). Jets survive, but their ironman is lost. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/12/12/sports/football/jets-survive-but-their-ironman-is-lost.html	N/A	N/A	N/A	N/A	N/A	N/A	Y, suspected	N/A	N/A	N/A
Litsky, F. (2005, November 13). Pro football; N.F.L. matchups week 10. <i>The New York Times</i> . Retrieved from http://query.nytimes.com/gst/fullpage.html?res=9E04E3DB133EF930A25752C1A9639C8B63	N/A	N/A	N/A	N/A	N/A	N/A	N	"The rest of the season" - up to 2.5 months depending on playoffs (3 weeks - 3 months)	N/A	N/A
Bell, J. (2005, August 30). Wizards' Klein is healthy again. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/08/30/sports/soccer/wizards-klein-is-healthy-again.html	N/A	N/A	N/A	N/A	N/A	N/A	N	"has not played since" - 9 weeks (3 weeks - 3 months)	N/A	N/A
Crouse, K. (2005, August 1). On Chrebet's mind, matters of risk vs. reward. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/08/01/sports/football/on-chrebet-s-mind-matters-of-risk-vs-reward.html	N/A	Wayne Chrebet, Pep Hamilton, Herman Edwards	Player, Coach, Coach	New York Jets	N/A	irritability (emotional disturbance), insomnia (other), memory loss (amnesia),	Y, Y confirmed:	9 games in one incident, one game in another (3 weeks - 3 months) (less than 3 weeks)	Y	N
Crouse, K. (2005, November 7). Three yards away from big victory, Jets can't reach it. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/11/07/sports/football/three-yards-away-from-big-victory-jets-cant-reach-it.html	N/A	N/A	N/A	N/A	N/A	N/A	Y, suspected	N/A	N/A	N/A

Crouse, K. (2005, August 20). Pennington shows that his arm's just fine. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/08/20/sports/football/pennington-shows-that-his-arms-just-fine.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	Y	N
Gray, G. (2005, September 15). A glass jaw can be a matter of heart. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/09/15/sports/othersports/a-glass-jaw-can-be-a-matter-of-heart.html	"When a fighter is clipped on the tip of the chin, his head swivels with such force, his brain vibrates inside his skull. That movement stretches nerve tissues in the brain, which then causes a concussion"	Barry Jordan	Physician	New York State Athletic Commission	N/A	N/A	N	N/A	N/A	N/A
Crouse, K. (2005, December 5). Patriots rip the seams of the patchwork Jets. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/12/05/sports/football/patriots-rip-the-seams-of-the-patchwork-jets.html	N/A	Ted Johnson	Player (former)	New England Patriots	vacant stare (dazed/stunned)	memory loss (amnesia)	Y, confirmed	N/A	N/A	N/A
Crouse, K. (2005, November 21). A loss, and the quarterback carousel spins again. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/11/21/sports/football/a-loss-and-the-quarterback-carousel-spins-again.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	N	N/A
Battista, J. (2005, August 5). Giants put Burrell on the waiting list. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/08/05/sports/football/giants-put-burrell-on-the-waiting-list.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	Y	N

Wyatt, E. (2005, July 2). Armstrong victory formula: ride fast but dodge disaster. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/07/02/sports/sportsspecial/armstrong-victory-formula-ride-fast-but-dodge-disaster.html	"slight concussion"	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A
Jones, R. L. (2005, January 3). Rams and Jets find playoff berths behind door no. 1. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/01/03/sports/football/rams-and-jets-find-playoff-berths-behind-door-no-1.html	"mild concussion"	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A
Crouse, K. (2005, November 13). Edwards falls back on resilience and family. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/11/13/sports/football/edwards-falls-back-on-resilience-and-family.html	N/A	N/A	N/A	N/A	N/A	N/A	Y, suspected	N/A	N/A	N/A
Borzi, P. (2005, May 10). 2 for the seesaw: young players lead twins. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/05/10/sports/baseball/2-for-the-seesaw-young-players-lead-twins.html	N/A	N/A	N/A	N/A	N/A	N/A	N	"13 games" about 3 weeks (3 weeks - 3 months)	N/A	N/A
Berkow, I. (2005, August 22). Cubs rookie recovering from a debut that nearly became an exit. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2005/08/22/sports/baseball/cubs-rookie-recovering-from-a-debut-that-nearly-became-an.html	N/A	N/A	N/A	N/A	N/A	vertigo (other)	N	N/A	N/A	N/A
Le Batard, D. (2005, January). We love the beauty of football. It's the players who feel the beast. <i>ESPN The Magazine</i> , 7(27). 12.	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A

Ogle, M. (2005, January). Volume control. <i>ESPN The Magazine</i> , 8(2). 114.	N/A	N/A	N/A	N/A	N/A	N/A	Y, confirmed	N/A	N/A	N/A
Over Time (2005, February). <i>ESPN The Magazine</i> , 8(3). 36.	N/A	N/A	N/A	N/A	knocked unconscious (LOC)	not knowing where he was, not knowing other opponent (amnesia)	N	N/A	N, N	N/A
Rubin, P. & Brenner, J. (2005, February). Head Case. <i>ESPN The Magazine</i> , 8(3). 42.	"mild traumatic brain injury"	Scott Anderson, Ellion Pellman, Jim Heidenreich	Head trainer, Chair, Vice President of Marketing	Sooners, NFL subcommittee on mild traumatic brain injury, Riddell	N/A	depression (emotional disturbance)	N	N/A	N/A	N/A
Assael, S. (2005, March). Shadow boxer. <i>ESPN The Magazine</i> , 8(5). 101-106.	N/A	N/A	N/A	N/A	staggers (other), eyes glazed (dazed/stunned), knocked out (LOC)	N/A	N	N/A	N	N/A
Patrick, D. (2005, March). I'm still smarter than half the guys in the league. <i>ESPN The Magazine</i> , 8(5). 118.	N/A	Keith Primeau	Player	Philadelphia Flyers	N/A	N/A	N	N/A	N/A	N/A
Wojciechowski, G. (2005, April). Cold Blooded. <i>ESPN The Magazine</i> , 8(7). 112-115.	"mild concussion"	Alice Sims, Chris Reis, Ernie Sims	Player's mother, Player, Player	Florida State University Football, Georgia Tech Football, Florida State University Football	N/A	blackout (other)	N	Remainder of season (3 weeks - 3 months)	N/A	N/A
McIntyre, D. (2005, June). Fieldwork. <i>ESPN The Magazine</i> , 8(11). 42.	N/A	Lorene Nelson	ALS Researcher	Stanford University	N/A	N/A	N	N/A	N/A	N/A
Roenigk, A. (2005, August). Fall guy. <i>ESPN The Magazine</i> , 8(15). 62-70.	N/A	Mat Hoffman	Player	BMX	loss of consciousness (LOC)	amnesia for six months (amnesia)	N	N/A	N/A	N/A
Grant, A. (2005, August). Cracked code. <i>ESPN The Magazine</i> , 8(16). 68-74.	N/A	Marcus Williams	Player	Oakland Raiders	loss of consciousness (LOC)	N/A	Y, confirmed	N/A	N/A	N/A
Fleming, D. (2005, September). Get a grip. <i>ESPN The Magazine</i> , 8(18). 78-82.	"multiply concussed"	N/A	N/A	N/A	"off to la la land" (other)	memory loss (amnesia)	N	N/A	N	N/A
Hradek, E. J. (2005, September). Rolling the dice twice. <i>ESPN The Magazine</i> , 8(18). 166.	"oft-concussed"	Eric Lindros	Player	Toronto Maple Leafs	N/A	migraines (headache/migraine)	N	since early 2003 (nearly 2.5 years) (greater than 1 year)	N/A	N/A
Adelson, E. (2005, October). The days and nights of Johnny Torts. <i>ESPN The Magazine</i> , 8(20). 82-89.	N/A	Pavel Kubina	Player	Tampa Bay Lightning	N/A	N/A	N	N/A	N/A	N/A

Appendix C.

Article Citation	Definition/ Description of concussion	Sources of information in the article			Signs and Symptoms		Recovery Time			
		Name of the person(s) being quoted/referenced about concussion.	What is their title? (player, coach, physician, researcher, etc.)	Are they affiliated with a specific organization? (league, team, etc.)	Signs:	Symptoms:	Mention of confirmed or suspected career-ending concussive injury? (Y/N) indicate suspected or confirmed	Length of time an athlete has missed due to concussion	Was an athlete removed from play following a suspected concussion ? (Y/N)	If yes, were they returned to play within the same game or practice? (Y/N)
Bishop, G. (2015, July 6). Brett Favre. <i>Sports Illustrated</i> . Retrieved from http://www.si.com/vault/2016/02/11/brett-favre	N/A	Brett Favre	Athlete	Green Bay Packers, Minnesota Vikings	N/A	Seeing fireworks (other) dizziness (dizziness) amnesia (amnesia)	N	N/A	N/A	N/A
Nilan, C. (2015, October 5). The fog of the fight. <i>Sports Illustrated</i> . Retrieved from http://www.si.com/vault/2016/02/11/fog-fight	N/A	Chris Nilan	Athlete, Article author	NHL, Montreal Canadiens	N/A	emotional changes (emotional disturbance)	N	N/A	N/A	N/A
Winn, L. (2015, November 9). Urban legend. <i>Sports Illustrated</i> . Retrieved from http://www.si.com/vault/2016/02/11/urban-legend	N/A	Fred VanVleet	Athlete	Wichita State University Basketball	Nearly knocked out (other), being a "bit off" (other)	foggy (cognitive), headache (headache), light sensitivity (light sensitivity)	N	N/A	N	N/A
Saint Louis, C. (2015, January 5). Limiting rest is found to help young concussion patients. <i>The New York Times</i> , n.p. http://www.nytimes.com/2015/01/05/us/limiting-rest-is-found-to-help-young-concussion-patients.html	Mild traumatic brain injury	Gerard Gioia	chief of pediatric neuropsychology	Children's National Medical Center in Washington	N/A	headache (headache), irritability (emotional disturbance), sadness (emotional disturbance), nausea (nausea)	N	N/A	N/A	N/A
Belson, K. (2015, October 24). N.F.L. to help fund search for new concussion therapy. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/10/25/sports/football/nfl-to-help-fund-search-for-new-concussion-therapy.html	N/A	Dr. Richard Ellenbogen	Co-chairman of the N.F.L.'s head, neck, and spine committee	NFL	N/A	N/A	N	N/A	N/A	N/A

Cacciola, S. (2015, May 29). Warriors' Klay Thompson has a concussion and is indefinitely sidelined. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/05/30/sports/basketball/klay-thompson-does-have-a-concussion-the-warriors-say.html?_r=0	"He took a nice little blow to the head" - Curry	Steve Kerr, Steph Curry	Coach, Player	Golden State Warriors - NBA	N/A	N/A	N	Indefinitely (unknown)	Y, Y	N, Y
Reiter, B. (2015, March 30). Battle mode. <i>Sports Illustrated</i> . Retrieved from http://www.si.com/vault/2015/03/30/106752177/battle-mode	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A
Price, S. (2015, December 7). It would hurt more not to play. <i>Sports Illustrated</i> . Retrieved from http://www.si.com/vault/2016/02/11/it-would-hurt-more-not-play	N/A	Michelle Witten	Wife of Player	Dallas Cowboys	N/A	N/A	N	N/A	N/A	N/A
McCarthy, M. (2015, December 14). Wheels in motion. <i>Sports Illustrated</i> . http://www.si.com/vault/2016/02/11/wheels-motion	A mild form of traumatic brain injury (TBI). "A concussion is a response of the brain to head trauma, "It doesn't define the head trauma; it's a response." - DP	Daniel Perl	head of the Center for Neuroscience and Regenerative Medicine's Brain Repository	Uniformed Services University of the Health Sciences	N/A	N/A	N	N/A	N/A	N/A
Hoffman, B. (2015, January 3). A.F.C. wild-card matchup: Cincinnati Bengals at Indianapolis Colts. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/01/04/sports/football/afc-wild-card-matchup-cincinnati-bengals-at-indianapolis-colts.html	N/A	N/A	N/A	N/A	N/A	N/A	N	5-7 days (less than 3 weeks)	N/A	N/A

Kreda, A. (2015, January 6). Rangers find top form, but a tough trip looms. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/01/07/sports/hockey/rangers-find-top-form-but-a-tough-trip-looms.html	N/A	N/A	N/A	N/A	N/A	N/A	N	"nearly six weeks" (3 weeks - 3 months)	N/A	N/A
Crouse, K. (2015, January 14). Returning to a mix that's hard to unscramble: Even with LeBron James, Cavaliers remain out of sync. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/01/15/sports/basketball/lebron-james-return.html	N/A	LeBron James	Player	Cleveland Cavaliers	N/A	N/A	N	N/A	N/A	N/A
Shpigel, B. (2015, January 17). As rules protect quarterbacks, N.F.L. defenses are on the defensive. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/01/18/sports/football/as-rules-protect-quarterbacks-nfl-defenses-are-on-the-defensive.html	N/A	Steve Mariucci, Bart Scott	Former N.F.L. coach and current N.F.L. analyst, former N.F.L. player	The National Football League, The National Football League	N/A	N/A	N	N/A	N/A	N/A
Tracy, M. (2015, January 17). Top conferences to allow aid for athlete's full bills. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/01/18/sports/ncaas-top-conferences-to-allow-aid-for-athletes-full-bills.html	N/A	Steve Patterson, Brian Hainline	Athletic Director, Chief medical officer	University of Texas, N.C.A.A.	N/A	N/A	N	N/A	N/A	N/A
Belson, K. (2015, January 18). With stunning brevity, Russell Wilson rises from his worst to his best. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/01/19/sports/football/wilson-rises-from-his-worst-to-his-best.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	Y	Y

Belson, K. (2015, January 22). Knocked for risks, league plays defense: 'Friday night tykes' returns with virtues played up. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/01/23/sports/football/friday-night-tykes-returns-with-virtues-played-up.html	N/A	Brian Morgan	Co-founder of Youth Football Organization	Texas Youth Football Association	N/A	N/A	N	N/A	N/A	N/A
Belson, K. (2015, January 28). To allay fears, N.F.L. huddles with mothers. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/01/29/sports/football/nfl-tries-to-reassure-mothers-as-polls-and-studies-rattle-them.html	N/A	Scott Hallenbeck, Charlotte Jones Anderson, Chris Nowinski, John Madden, Michael Kaplen	Director of USA Football, executive VP, executive director, former coach, Lawyer representing brain trauma victims	The National Football League, The Dallas Cowboys, Sports Legacy Institute, The National Football League, none,	N/A	N/A	N	N/A	N/A	N/A
Hoffman, B. (2015, February 2). Hit in head Patriots' Julian Edelman stays in, leaving questions. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/02/02/sports/football/hit-in-head-patriotsjulian-edelman-stays-in-leaving-questions.html	N/A	Julian Edelman	Player	The New England Patriots	looking disoriented (other)	N/A	N	2 regular season games - about two weeks (less than 3 weeks)	N	N/A
Macur, J. (2015, February 2). Cheering. Cringing. Loving it. Hating it. But watching. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/02/03/sports/football/super-bowl-magnified-love-hate-relationship-with-nfl.html	N/A	N/A	N/A	N/A	dazed (dazed/stunned), glassy eyes (other)	N/A	N	2 regular season games - about two weeks (less than 3 weeks)	Y, N	N, N/A
Belson, K. (2015, February 14). Catching or throwing. Worthy of the N.F.L. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/02/15/sports/football/julian-edelman-catching-or-throwing-worthy-of-the-nfl.html	N/A	Julian Edelman	Player	The New England Patriots	stumbling (other)	N/A	N	N/A	N/A	N/A

Richards, H. (2015, February 15). <i>Ireland and England wins set up Dublin showdown</i> . n.p. http://www.nytimes.com/2015/02/16/sports/rugby/ireland-and-england-win-to-set-up-a-six-nations-showdown.html	N/A	N/A	N/A	N/A	N/A	N/A	N	3 months (3 months - 1 year)	N/A	N/A
Branch, J. (2015, February 18). After former player's death, concussion litigation against N.H.L. gains heft. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/02/19/sports/hockey/concussion-litigation-against-nhl-gains-heft.html	N/A	Charles Zimmerman, William Gibbs	Attorney, Attorney	Plaintiffs (suing NHL regarding concussions), Representing players suing the NHL regarding concussions	N/A	N/A	Y, confirmed	N/A	N/A	N/A
Branch, J. (2015, February 27). Brain injury awareness improving, Richter says. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/02/28/sports/hockey/mike-richter-still-doing-his-part-to-raise-concussion-awareness.html	N/A	Mike Richter	Player (former),	The New York Rangers	N/A	clouded mind (cognitive)	Y, confirmed	11 months, returned for one month and then out for another 4 months (greater than a year)	N/A	N/A
Giles, M. (2015, February 28). Top rebounder refuses to surrender to his history of concussions. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/03/01/sports/ncaabasketball/top-rebounder-refuses-to-surrender-to-his-history-of-concussions.html?_r=0	N/A	Mike Aaman, Veronica Aaman,	Player, player's mom	Wagner University	N/A	N/A	Y, Y, - suspected and confirmed	"Several more [games]" (less than 3 weeks)	N/A	N/A
Spurgeon, B. (2015, March 5). What to expect in the 2015 season. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/03/06/sports/autoracing/what-to-expect-in-the-2015-formula-one-season.html	N/A	N/A	N/A	N/A	N/A	N/A	N	two races (less than 3 weeks)	N/A	N/A

Macur, J. (2015, March 5). A former college lineman now on the streets, looking for answers, and help: Ryan Hoffman, a U.N.C. football player two decades ago, is now homeless. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/03/08/sports/ncaafootball/ryan-hoffman-a-unc-football-player-two-decades-ago-is-now-homeless.html	N/A	Ryan Hoffman, Ramogi Huma,	Player (former), Executive,	University of North Carolina, National College Players Association and the college players union	vomiting (vomiting)	headaches (headache/migraine), dizziness (dizziness) hearing loud noises (other), seeing flashing lights (other)	N	N/A	N/A	N/A
Barber, S. (2015, March 7). Parents need to know risks in sports [Letter to the Editor]. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/03/08/sports/letters-to-the-editor.html	brain injury	Steven Barber (author)	Neurosurgeon and director of concussion evaluation service	Abington Memorial Hospital	N/A	N/A	Y - confirmed	N/A	N/A	N/A
Waldstein, D. (2015, March 8). M.L.S.'s newest clubs make ugly debut, but sellout crowd sees plenty of charm: New York City F.C. and Orlando City S.C. play to a draw. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/03/09/sports/soccer/new-york-city-fc-and-orlando-city-sc-play-to-a-1-1-draw-in-mls-debut.html	N/A	Don Garber	Commissioner	M.L.S.	N/A	N/A	N	N/A	Y	Y
Reynolds, G. (2015, March 11). A simple flashcard test to detect concussions. <i>The New York Times</i> . n.p. http://well.blogs.nytimes.com/2015/03/11/a-2-minute-test-to-detect-concussions/	"when the brain is physically jostled within the skull"	Dr. Steven Galetta	chairman of neurology	NYU Langone Medical Center	loss of consciousness (LOC)	dazed (cognitive), dizzy (dizziness), head pain (headache)	N	N/A	N/A	N/A
Macur, J. (2015, March 11). Homeless former U.N.C. player balks at efforts to help him. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/03/12/sports/ncaafootball/homeless-former-unc-player-balks-at-offers-to-help-him.html	N/A	Kevin Guskiewicz	concussion expert and professor,	University of North Carolina	N/A	N/A	N	N/A	N/A	N/A

Goldstein, R. (2015, March 21). Chuck Bednarik, Eagles' man of concrete, dies at 89. <i>The New York Times</i> , n.p. http://www.nytimes.com/2015/03/22/sports/football/chuck-bednarik-famed-football-tough-guy-dies-at-89.html	"deep concussion"	N/A	N/A	N/A	did not get up (other)	N/A	N	N/A	N/A	N/A
Tracy, M. (2015, March 21). Gonzaga becomes a melting pot for recruits from across the globe. <i>The New York Times</i> , n.p. http://www.nytimes.com/2015/03/22/sports/ncaabasketball/recruits-from-across-the-globe-find-a-melting-pot-in-gonzaga.html	N/A	N/A	N/A	N/A	N/A	N/A	N	An entire season (3 months - 1 year)	N/A	N/A
Bakalar, N. (2015, March 21). Study suggests that hitters' production drops after they return from concussions. <i>The New York Times</i> , n.p. http://www.nytimes.com/2015/03/22/sports/baseball/study-suggests-that-hitters-production-dips-after-they-return-from-concussions.html	N/A*	Dr. Jeffery Bazarian, Dr. Gary Green	Physician and Director of Emergency Medicine, Medical Director	University of Rochester, Major League Baseball	N/A*	N/A*	N	N/A	N/A	N/A
Kreda, A. (2015, March 23). Islanders invite Pat LaFontaine to bid farewell to Nassau Coliseum. <i>The New York Times</i> , n.p. http://www.nytimes.com/2015/03/24/sports/hockey/islanders-invite-pat-lafontaine-to-bid-farewell-to-nassau-coliseum.html	N/A	N/A	N/A	N/A	N/A	N/A	Y, confirmed	N/A	N/A	N/A
Belson, K. (2015, March 23). Jets owner Woody Johnson says he's not concerned about tampering inquiry. <i>The New York Times</i> , n.p. http://www.nytimes.com/2015/03/24/sports/football/jets-owner-woody-johnson-says-hes-not-concerned-about-tampering-inquiry.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	N	N/A

Witz, B. (2015, March 24). Yankees' Chris Young breaks out of slump with two home runs. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/03/24/sports/baseball/yankees-chris-young-breaks-out-of-slump-with-two-home-runs.html	N/A	N/A	N/A	N/A	N/A	N/A	N	3 days (less than 3 weeks)	N/A	N/A
Belson, K. (2015, March 24). A few words from Bill Belichick after a Super Bowl win. Very few. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/03/25/sports/football/nfl-coaches-pull-up-a-chair-and-be-themselves.html	N/A	N/A	N/A	N/A	disorientation (other), unstable (other)	N/A	N	N/A	N/A	N/A
Witz, B. (2015, March 24). Jose Pirela says he's fine, but Yankees are wary. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/03/25/sports/baseball/jose-pirela-says-hes-fine-but-yankees-are-wary.html?_r=0	N/A	Jose Pirela	Player	New York Yankees	vomiting (vomiting)	dizziness (dizziness), headaches (headache)	N	Six weeks (previous injury), (3 weeks - 3 months), two days and counting (current injury) (less than 3 weeks)	Y	N
Pennington, B. (2015, March 30). With Travis Trice in control, Michigan State keeps calm and moves on. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/03/31/sports/ncaabasketball/with-travis-trice-in-control-michigan-state-keeps-calm-and-moves-on.html	"debilitating concussion"	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A
Witz, B. (2015, April 1). Injuries spur unplanned infield shift for Yankees. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/04/02/sports/baseball/brendan-ryan-injuries-spur-unplanned-infield-shift-for-yankees.html	N/A	N/A	N/A	N/A	N/A	N/A	N	"Since March 22nd" (10 days) (less than 3 weeks)	N/A	N/A

Shpigel, B. (2015, April 16). Rangers seize quick lead and don't let go. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/04/17/sports/hockey/rangers-take-game-1-defeating-penguins.html	N/A	N/A	N/A	N/A	N/A	N/A	N	"sidelined indefinitely" (unknown)	N/A	N/A
Belson, K. (2015, April 22). Judge approves deal in N.F.L. concussion suit. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/04/23/sports/football/nfl-concussion-settlement-is-given-final-approval.html	N/A*	Anita B. Brody, Christopher Seeger, Kevin Turner, Scott Rosner, Steven Strauss, Jeff Pash	Judge, Attorney, Player (former), Attorney & Professor, Attorney, Attorney	Federal District Court, Plaintiffs (former N.F.L. players and families), N/A, University of Pennsylvania, Seau family, N.F.L.	N/A	N/A	N	N/A	N/A	N/A
Kreda, A. (2015, April 25). Islanders, who won't go quietly, force a game 7 against the Capitals. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/04/26/sports/hockey/islanders-who-wont-go-quietly-force-a-game-7-against-the-capitals.html	N/A	N/A	N/A	N/A	N/A	N/A	N	2 months (3 weeks - 3 months)	N/A	N/A
Megdal, H. (2015, May 3). Competitive environment complicates decisions about head injuries. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/05/04/sports/soccer/competitive-environment-complicates-decisions-about-head-injuries.html	"minor" concussion, "head injury", "small" concussions	Ali Krieger, Taylor Twellman, Michelle Akers	Player, Analyst & former player, player (former)	U.S. Women's National Soccer Team, ESPN, U.S. Women's National Soccer Team	loss of consciousness (LOC)	headaches (headache/migraine)	Y, confirmed	a couple of months (3 weeks - 3 months)	Y, Y	N, N
Branch, J. (2015, May 12). Steve Montador had C.T.E.; family to sue N.H.L. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/05/13/sports/hockey/steve-montador-had-brain-trauma-family-to-sue-nhl.html	"debilitating concussion"	Paul Montador, N.H.L. (statement)	Player's father, statement,	Chicago Blackhawks, N.H.L..	N/A	N/A	Y, confirmed	N/A	N/A	N/A
Pickens, P. (2015, May 14). The N.H.L.'s conference finals are a story of mirror images and even matches. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/05/15/sports/hockey/nhl-conference-finals-preview.html	"a hit to the head"	N/A	N/A	N/A	N/A	N/A	N	one round (a game) (less than 3 weeks)	Y	N

Rohan, T. (2015, May 16). Rangers-Lightning trade made last season becomes series sidebar. <i>The New York Times</i> . N.p. http://www.nytimes.com/2015/05/17/sports/hockey/rangers-lightning-trade-made-last-season-becomes-series-sidebar.html	"apparent concussion"	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A
Berkman, S. (2015, May 17). Mets' Noah Syndergaard shuts down Brewers in Citi Field Debut. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/05/18/sports/baseball/mets-noah-syndergaard-shuts-down-brewers-in-citi-field-debut.html	N/A	N/A	N/A	N/A	left him on the ground for several minutes (other)	N/A	N	N/A	Y	N
Strauss, B. (2015, May 20). Concussion lawsuits rankle school groups. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/05/21/sports/football/concussion-lawsuits-rankle-school-groups.html	N/A	Alex Pierscioneck, Bob Gardner, Marty Hickman, Hosea Harvey, Kerri Lowrey, Joseph Siprut	Player, executive director, executive director, law professor, Attorney, Attorney	Elgin High School (Illinois), National Federation of High School Associations, Illinois High School Athletic Association, Temple University, Network for Public Health Law, Player's Attorney	N/A	blacked out (other), anxious (emotional disturbance), depressed (emotional disturbance), suicidal thoughts (emotional disturbance), headaches (headache/migraine)	N	N/A	N	N/A
Longman, J. (2015, May 22). Abby Wambach, unconcerned with broken records or nose, craves World Cup title. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/05/24/sports/soccer/abby-wambach-unconcerned-with-broken-records-or-nose-craves-world-cup-title.html	N/A	Abby Wambach	Player	Women's National Team (Soccer)	N/A	N/A	N	N/A	Y	Y

Rhoden, W. (2015, May 26). Al Attles, a Warrior for life, is a bridge to a lone Bay Area title. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/05/27/sports/basketball/al-attles-part-of-warriors-past-is-still-a-presence.html	"possible concussion"	N/A	N/A	N/A	N/A	N/A	N	N/A	Y	Y
Cacciola, S. (2015, May 28). Stephen Curry bounces back, and the Warriors head to the finals. <i>The New York Times</i> . N.p. http://www.nytimes.com/2015/05/28/sports/basketball/stephen-curry-bounces-back-and-the-warriors-head-to-the-finals.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A
Hoffman, B. (2015, May 28). N.B.A. finals: a first look at Cavaliers vs. Warriors. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/05/29/sports/nba-finals-a-first-look-at-cavaliers-vs-warriors.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	Y	N
Rohan, T. (2015, May 28). Coach's process fuels Ranger's procession. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/05/29/sports/hockey/coachs-process-fuels-rangers-procession.html	"apparent concussion"	N/A	NA	N/A	N/A	N/A	N	N/A	Y	N
Rohan, T. (2015, May 29). Rangers are shut out in game 7 as Lightning reach finals. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/05/30/sports/hockey/rangers-are-eliminated-as-tampa-bay-wins-game-7.html	"suspected concussion"	N/A	N/A	N/A	N/A	N/A	N	N/A	Y	N

Cacciola, S. (2015, June 1). Warriors' Andrew Bogut seems content with role defined for him. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/06/02/sports/basketball/warriors-andrew-bogut-seems-content-with-role-defined-for-him.html	N/A	N/A	N/A	N/A	N/A	N/A	N	sustained a concussion last week and will be re-evaluated on Tuesday (less than 3 weeks)	Y	N
Strauss, B. (2015 June 8). Former soccer player sues Illinois, saying concussion was mishandled. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/06/09/sports/soccer/former-soccer-player-sues-illinois-saying-concussion-was-mishandled.html	"head injuries"	Casey Conine, Joseph Siprut	Player (former), Attorney	University of Illinois Women's Soccer, Attorney for former player	staggered (other)	nauseous (nausea), headaches (headache/migraine), light sensitivity (sensitivity to light), unable to concentrate on school (cognitive)	Y, suspected	N/A	N	N/A
Strauss, B. (2015, June 9). Former player opposes settlement in N.C.A.A. concussion suit. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/06/10/sports/football/former-player-opposes-settlement-in-ncaa-concussion-suit.html	"brain injuries"	Joseph Siprut, Ramogi Huma	Attorney, President	Plaintiffs (suing NCAA), Player's Association	N/A	N/A*	N/A	N/A	N/A	N/A
Powell, M. (2015, June 12). Hope fills the 7 train for Mets fans. The next stop: reality. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/06/13/sports/baseball/along-with-hope-mets-fans-have-questions-and-long-memories.html	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A
Barry, D. (2015, June 21). An athlete felled by concussions, despite playing a 'safer' sport. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/06/22/sports/an-athlete-felled-by-concussions-despite-playing-a-safer-sport.html	"had his bell rung"	Curtis Baushke, Bill Baushke, Dave Donahue, Patti Baushke	Player (deceased), Player's father, Coach, player's mom	Clarksville High School	knocked unconscious (LOC)	migraines (headache/migraine), dramatic mood swings (emotional disturbance), depression (emotional disturbance), headaches so debilitating he would need to lie down in a dark room (headache/migraine)	N	N/A	Y, N	N, N

Longman, J. (2015, July 1). After heads bang, interests collide for FIFA. <i>The New York Times</i> . N.p. http://www.nytimes.com/2015/07/02/sports/soccer/womens-world-cup-semifinal-injuries-morgan-brian-alexandra-popp.html	N/A	Taylor Twellman, Jill Ellis, Silvia Neid, Morgan Brian, Brandi Chastain, Briana Scurry	Player, Coach, coach, player, player, player	Major League Soccer (women's), United States Women's soccer team, Germany Women's soccer team, Women's Soccer Team, Women's soccer team, US W Soccer team	N/A	N/A	N	N/A	N	N/A
Meier, B. & Ivory, D. (2015, July 3). Effective concussion treatment remains frustratingly elusive, despite a booming industry. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/07/05/business/effective-concussion-treatment-remains-frustratingly-elusive-despite-a-booming-industry.html	mild traumatic brain injury, mild concussion	Rashada Parks, Michael Singer, Dr. Ramon Diaz-Arrastia, Blaine Hoshizaki, Carl Castro	Concussion patient, chief executive, expert, professor, professor	Hyperbaric clinic, Brain Scope, Uniformed Services University of the Health Sciences, University of Ottawa, University of Southern California	N/A	neck pain (other), mood swings (emotional disturbance), concentration problems (cognitive)	N	N/A	N/A	N/A
Powell, M. (2015, July 16). A long hardwood journey. <i>The New York Times</i> . n.p. http://www.nytimes.com/2015/07/19/sports/a-long-hardwood-journey.html	N/A	N/A	N/A	N/A	N/A	N/A	N	two weeks (less than 3 weeks)	N/A	N/A
Hey, Tom Brady, here's how you destroy a cell phone. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/07/30/sports/football/hey-tom-brady-heres-how-you-destroy-a-cellphone.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A
Goldstein, R. & Weber, B. (2015, August 9). Frank Gifford, star for Giants and in the broadcast booth, dies at 84. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/08/10/sports/football/frank-gifford-early-nfl-celebrity-as-player-and-broadcaster-dies-at-84.html	N/A	N/A	N/A	N/A	lay motionless on the field (other)	N/A	Y, confirmed	"ending his season" (hit happened in November) (3 months - 1 year)	Y	N

Berkman, S. (2015, August 17). Starter's injury tempers Yankees' extra-inning win over Twins. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/08/18/sports/baseball/yankees-pitcher-bryan-mitchell-hit-in-head-by-line-drive.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	Y	N
Kepner, T. (2015, August 17). Yankees game turns grisly in an instant as Bryan Mitchell is hit. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/08/18/sports/baseball/yankees-deliveries-are-handled-with-care.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	Y	N
Kannapell, A. & Stevenson, S. (2015, August 18). Your Tuesday evening briefing. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/08/18/nytnow/your-tuesday-evening-briefing.html	N/A	N/A	N/A	N/A	N/A	N/A	N	on the seven day disabled list (less than 3 weeks)	Y	N
Witz, B. (2015, August 18). Yankees' Bryan Mitchell lands on 7-day disabled list. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/08/19/sports/baseball/yankees-bryan-mitchell-lands-on-7-day-disabled-list.html	N/A	Bryan Mitchell	Player	New York Yankees	N/A	N/A	N	on the seven day disabled list (less than 3 weeks)	Y	N
Belson, K. (2015, August 20). Concussion deal is challenged in court as insufficient. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/08/21/sports/football/concussion-deal-is-challenged-in-court-as-insufficient.html	N/A	N/A	N/A	N/A	N/A	mood swings (emotional disturbance), sleep disorders (other), vertigo (other), dizziness (dizziness), headaches (headache/migraine)	N	N/A	N/A	N/A

The Associated Press, Shpigel, B., & Belson, K. (2015, August 20). Packers unveil plan for a sports and entertainment district. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/08/21/sports/football/packers-unveil-plan-for-a-sports-and-entertainment-district.html	N/A	N/A	N/A	N/A	N/A	N/A	N	"no idea' how long he would be sidelined" (unknown)	Y	N
Hoffman, B. (2015, August 22). After a long absence, a return to the game can be tough. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/08/23/sports/baseball/after-a-long-absence-a-return-to-the-game-can-be-tough.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	N	N/A
Pedulla, T. (2015, August 22). Giants' first-string offense slips again. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/08/23/sports/football/giants-first-string-offense-trips-again-against-the-jaguars.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	Y	N

Brody, J. E. (2015, August 24). Concussions can occur in all youth sports. <i>The New York Times</i> . Retrieved from http://well.blogs.nytimes.com/2015/08/24/concussions-can-occur-in-all-youth-sports/	"ding" "bell ringer" "mild traumatic brain injuries" - notes that the injury can occur from hits to the head OR the body aka whiplash injuries	Steven P. Broglio	Director of Neurotrauma research and author.	University of Michigan	loss of consciousness (LOC), vomiting (vomiting)	disruption of mental alertness (cognitive), Difficulty thinking clearly concentrating or remembering new information (cognitive), Headache (headache), blurry vision (other), queasiness (nausea), dizziness or balance problems (dizziness) or sensitivity to noise or light (sensitivity to noise) (sensitivity to light), Irritability (emotional disturbance), moodiness (emotional disturbance), sadness (emotional disturbance), or nervousness (emotional disturbance), Excessive sleepiness or difficulty falling asleep or remaining asleep (other)	N	N/A	N/A	N/A
Barrow, K. (2015, August 28). The weekly health quiz: water, concussion risk, and jet lag. <i>The New York Times</i> . Retrieved from http://well.blogs.nytimes.com/2015/08/28/the-weekly-health-quiz-water-concussion-risk-and-jet-lag/	N/A	N/A	N/A	N/A	loss of consciousness (LOC)	N/A	N	N/A	N/A	N/A
Shpigel, B. (2015, August 30). Jets' Leonard Williams expected for opener after test reveals a strain. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/08/31/sports/baseball/jets-leonard-williams-expected-for-opener-after-test-reveals-a-strain.html	N/A	N/A	N/A	N/A	N/A	N/A	N	"did not know when Johnson would return" (unknown)	Y	N

Brody, J. E. (2015, August 31). The right response to youth concussions. <i>The New York Times</i> . Retrieved from http://well.blogs.nytimes.com/2015/08/31/the-right-response-to-youth-concussions/	N/A	Steven P. Broglio	Director of Neurotrauma research and author.	University of Michigan	fluctuating level of consciousness (other), vomiting (vomiting)	increasing confusion (cognitive), irritability (emotional disturbance), worsening headache (headache/migraine)	N	"Once all signs and symptoms of concussion are gone, which can take one to two weeks or longer, a gradual return to activity can begin" (less than 3 weeks)	N/A	N/A
Belson, K. (2015, September 1). Sony altered 'Concussion' film to prevent N.F.L. protests, e-mails show. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/02/sports/football/makers-of-sonys-concussion-film-tried-to-avoid-angering-nfl-emails-show.html	"blows to the head"	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A
Berkman, S. (2015, September 2). Matt Harvey lifts Mets, then shows signs of fatigue. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/03/sports/baseball/matt-harvey-lifts-mets-as-their-gaze-shifts-to-october.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	N	N/A
Rothenberg, B. (2015, September 6). Eugenie Bouchard withdraws from U.S. open. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/07/sports/tennis/Eugenie-bouchard-withdraws-from-us-open.html	N/A	N/A	N/A	N/A	N/A	severe headache (headache/migraine), sensitivity to light and noise (sensitivity to noise) (sensitivity to light)	N	The remainder of the U.S. open (less than 3 weeks)	N/A	N/A
Shpigel, B. (2015, September 13). Big win but bigger worries for Jets. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/14/sports/football/despite-injuries-jets-light-up-in-second-half-to-top-browns.html	N/A	Chris Ivory, Brandon Marshall, Calvin Pace	Player, Player, Player	New York Jets	N/A	N/A	N	unknown (unknown)	Y, Y	N, N

Rhoden, W. C. (2015, September 14). A quick reminder of football's violence. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/14/sports/football/a-quick-reminder-of-footballs-violence.html	N/A	D'Brickashaw Ferguson, Todd Bowles, Willie Colon, George Kahwaty	Player, Coach, Player, Player	New York Jets, youth league football	N/A	N/A	N	unknown (unknown)	Y, Y	N, N
Pedulla, T. (2015, September 14). Injuries to two Jets are not as devastating as first feared. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/15/sports/football/jets-lorenzo-mauldin-released-from-hospital.html	N/A	Todd Bowles	coach	New York Jets	N/A	sensitivity to light (sensitivity to light)	N	unknown (unknown)	Y, Y	N, N
Pennington, B. (2015, September 21). Amid tumult, Giants uncover glimpses of hope. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/22/sports/football/amid-tumult-giants-strive-to-regain-some-order.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	Y	N
Shpigel, B. (2015, September 22). Baffling Colts, and maybe fans, Jets go 2-0. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/22/sports/football/baffling-colts-and-maybe-fans-jets-go-to-2-0.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	Y	N
Belson, K. (2015, September 23). Kam Chancellor ends holdout and reports to Seahawks. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/24/sports/football/kam-chancellor-ends-holdout-and-reports-to-seahawks.html	N/A	N/A	N/A	N/A	N/A	N/A	N	almost two weeks (per N.F.L... concussion protocol) (less than 3 weeks)	N/A	N/A

Shpigel, B. (2015, September 25). Two weeks after scare, Jets rookie is set to return. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/26/sports/football/two-weeks-after-scare-jets-rookie-lorenzo-mauldin-is-set-to-return.html	N/A	Lorenzo Mauldin	Player	New York Jets	loss of consciousness (LOC)	amnesia (amnesia), migraines (headache/migraine), headaches (headache/migraine), sensitivity to light (sensitivity to light)	N	two weeks (less than 3 weeks)	Y	N
Pennington, B. (2015, September 25). The Giants' wait for Victor Cruz could be nearing an end. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/26/sports/football/the-giants-wait-for-victor-cruz-could-be-nearing-an-end.html	N/A	N/A	N/A	N/A	N/A	N/A	N	"missed Thursday's game because of a concussion sustained last week" (less than 3 weeks)	N/A	N/A
Witz, B. (2015, September 27). Luis Severino pitches Yankees a step closer to a playoff berth. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/28/sports/baseball/luis-severino-pitches-yankees-a-step-closer-to-a-playoff-berth.html	N/A	Stephen Drew	Player	New York Yankees	N/A	Dizziness (believes it was from a concussion sustained two years prior) (dizziness)	N	N/A	N/A	N/A
Belson, K. (2015, September 28). As worries rise and players flee, a Missouri school board cuts football. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/29/sports/football/As-Worries-Rise-and-Players-Flee-a-Missouri-School-Board-Cuts-Football.html	N/A	Roger Goodell, Terry O'Neil, Nelson Mitten	Commissioner, Founder, President	N.F.L..., Practice like Pros, Maplewood Richmond Heights School Board	N/A	N/A	N	N/A	N/A	N/A
Shpigel, B. (2015, September 28). After defeat, Jets share blame, which is painful. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/29/sports/football/after-defeat-jets-share-blame-which-is-painful.html	"head injury"	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A

Phillips, D. (2015, September 29). Concussions in a required class: boxing at military academies. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/30/us/despite-concussions-boxing-is-still-required-for-military-cadets.html	"minor concussions"	Dr. Robert Cantu, Lt. Gen. Robert L. Caslen Jr., Unnamed, Unnamed	neurologist, Superintendent, parent	Boston University, West Point, West Point, West Point	knocked out (LOC), vomiting (vomiting)	headaches (headache/migraine),	N	two weeks, more than a week, (less than 3 weeks) (less than 3 weeks)	N/A	N/A
Waldstein, D. (2015, September 29). Red Sox pound Pineda as Yanks continue stumble toward playoffs. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/09/30/sports/baseball/red-sox-pound-pineda-as-yanks-continue-stumble-toward-playoffs.html	N/A	Stephen Drew	Player	New York Yankees	N/A	N/A	N	unknown, could be two or three days but could miss remainder of season (unknown)	N/A	N/A
Witz, B. (2015, October 1). Another step forward with the regressing Yankees. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/10/01/sports/baseball/another-step-forward-for-the-regressing-yankees.html	N/A	N/A	N/A	N/A	N/A	dizziness (dizziness)	N	N/A	N/A	N/A
Witz, B. (2015, October 2). Yankees ponder playoff, and opposing pitchers. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/10/03/sports/baseball/yankees-ponder-playoff-and-opposing-pitchers.html	"vestibular concussion"	N/A	N/A	NA	N/A	N/A	N	N/A	N/A	N/A
Barry, D. (2015, October 2). On a trip to Fenway, only the game was meaningless. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/10/04/sports/baseball/on-a-trip-to-fenway-only-the-game-was-meaningless.html	N/A	Bill Malinowski	Player (former)	Connecticut College Men's basketball	dazed (dazed/stunned), "lights out" (other)	N/A	N	N/A	N/A	N/A

Hoffman, B. (2015, October 4). Andrew Luck is out with a shoulder injury for Indianapolis Colts. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/10/05/sports/football/indianapolis-colts-andrew-luck-injury-jaguars.html	N/A	N/A	N/A	N/A	N/A	N/A	N	a week (less than 3 weeks)	N/A	N/A
Pennington, B. (2015, October 7). Giants are briefed on MRSA as teammate recovers. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/10/08/sports/giants-are-briefed-on-mrsa-as-teammate-recovers.html	N/A	N/A	N/A	N/A	N/A	N/A	N	Since Sunday (five days) (less than 3 weeks)	N/A	N/A
Waldstein, D. (2015, October 8). Rangers rough up David Price and the Blue Jays. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/10/09/sports/baseball/rangers-rough-up-david-price-and-the-blue-jays.html	N/A	Josh Gibbons	Coach	Toronto Blue Jays	N/A	N/A	N	N/A	N	N/A
Pennington, B. (2015, October 12). Giants connect with teammate being treated for MRSA. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/10/13/sports/football/giants-connect-with-teammate-being-treated-for-mrsa.html	N/A	Tom Coughlin	Coach	New York Giants	N/A	N/A	N	N/A	N/A	N/A
Rothenberg, B. (2015, October 14). Eugenie Bouchard sues over injuries from fall at U.S. open. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/10/15/sports/tennis/eugenie-bouchard-sues-over-injuries-from-fall-at-us-open.html	N/A	Benedict Morelli	Attorney	Representing Eugenie Bouchard	N/A	dizziness (dizziness)	N	N/A	N/A	N/A

Pennington, B. (2015, October 15). Prince Amukamara is out with pectoral injury, hampering Giants secondary. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/10/16/sports/football/giants-prince-amukamara-is-injured-jayron-hosley-to-step-in.html	N/A	N/A	N/A	N/A	N/A	N/A	N	Since Sunday (two days), (less than 3 weeks)	N/A	N/A
Hoffman, B. (2015, October 18). Landry Jones breathes life back into Steelers' offense. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/10/19/sports/football/pittsburgh-steelers-landry-jones-beat-arizona-cardinals.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	Y	Y
Walter, D. (2015, October 30). As polo sheds its elitist image, teams crop up on campus. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/11/01/education/edlife/as-polo-sheds-its-elitist-image-teams-crop-up-on-campus.html	N/A	N/A	N/A	N/A	N/A	N/A	N	remainder of a tournament (less than 3 weeks)	N/A	N/A
Shpigel, B. (2015, November 6). Everyone's son. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/11/08/sports/football/lorenzo-mauldin-new-york-jets-keeps-bouncing-back.html	N/A	Lorenzo Mauldin	Player	New York Jets	loss of consciousness (LOC)	memory loss (amnesia)	N	one game (less than 3 weeks)	Y	N
Hoffman, B. (2015, November 9). Time for Dallas Cowboys fans to give up hope. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/11/10/sports/time-for-dallas-cowboys-fans-to-give-up-hope.html	N/A	N/A	N/A	N/A	N/A	N/A	N	missed no time (less than 3 weeks)	Y	N

Strauss, B. (2015, November 9). U.S. soccer, resolving lawsuit, will limit headers for youth players. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/11/10/sports/soccer/us-soccer-resolving-lawsuit-will-limit-headers-for-youth-players.html	N/A	Steve Berman	Attorney	Plaintiffs (suing FIFA)	N/A	N/A	N	N/A	N/A	N/A
Slotnik, D. E. (2015, November 12). Fred McNeill, who played in two Super Bowls, dies at 63. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/11/13/sports/football/fred-mcneill-who-played-in-two-super-bowls-dies-at-63.html	N/A	Fred McNeill	Player (former)	Minnesota Vikings	N/A	dizziness (dizziness)	N	N/A	N/A	N/A
Dykes, B. M. (2015, November 12). N.F.L. week 10 previews and picks. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/11/15/sports/football/nfl-week-10-schedule-preview-picks.html	"concussion-plagued"	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A
Rothenberg, B. (2015, November 16). U.S.T.A. responds to Eugenie Bouchard's suit over a head injury. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/11/17/sports/tennis/usta-responds-to-eugenie-bouchards-suit-over-a-head-injury.html	N/A	N/A	N/A	N/A	N/A	dizziness (dizziness)	N	four tournaments (3 weeks - 3 months)	N/A	N/A
Tracy, M. (2015, November 19). Concussions ended his football dreams, now, at 24, he helps others achieve theirs. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/11/20/sports/ncaafootball/concussions-ended-his-football-dreams-now-at-24-he-helps-others-achieve-theirs.html	N/A	Clint Trickett, Rick Trickett, Dave Kerns	Player (former), Player's father, Athletic Trainer	West Virginia football	loss of consciousness (LOC)	vision changes (other), headache (headache/migraine), in a fog (cognitive) haze (cognitive), dizziness (dizziness), pain (other), memory problems (amnesia), mood changes (emotional disturbance)	Y, confirmed	one game (less than 3 weeks)	Y	N

Kreda, A. (2015, November 19). Tie Domi moves from penalty box to arena suite, watching his son's blossoming career. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/11/20/sports/hockey/tie-domi-moves-from-penalty-box-to-arena-suite-watching-his-sons-blossoming-career.html	"got your bell rung"	Tie Domi	Player (former)	Toronto Maple Leafs	N/A	N/A	N	N/A	N/A	N/A
Kannapell, A. & Stevenson, S. (2015, November 23). Your Monday evening briefing: Brussels, Pfizer, David Cameron. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/11/23/nytnow/your-monday-evening-briefing-brussels-pfizer-david-cameron.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	N	N/A
Belson, K. (2015, November 23). A player concussed, a policy questioned. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/11/24/sports/football/st-louis-rams-case-keenum-concussion.html	"head injury"	Brian McCarthy, Jeff Fisher, Dr. Erin Manning, Bernie Miklasz, Wes Welker	Spokesman, Coach, Neurologist, Sports Writer, Player	N.F.L., St. Louis Rams, Hospital for Special Surgery in New York, St. Louis, St. Louis Rams	loss of balance (other)	dazed (cognitive)	N	N/A	N	N/A
Belson, K. (2015, November 25). Frank Gifford had brain disease, his family announces. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/11/26/sports/football/frank-gifford-had-cte-family-says.html	"blows to the head"	Chris Nowinski	Founder,	Concussion Legacy Foundation	loss of consciousness (LOC)	N/A	Y confirmed	did not return for the rest of the season (3 months - 1 year)	Y, N	N, N/A
Sablich, J. & Sablich, J. (2015, November 27). Fantasy football week 12: rankings and matchup analysis. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/11/28/sports/fantasy-football-week-12-rankings-and-matchup-analysis.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	Y	N

Reichard, L. (2015, November 28). Rethinking a policy [Letter to the Editor]. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/11/29/sports/letters-to-the-editor.html	"blow to the head"	N/A	N/A	N/A	dazed (dazed/stunned)	N/A	N	N/A	N	N/A
Shpigel, B. (2015, November 30). Facing Giants, Jets focus on playoffs, not rivalry. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/01/sports/football/facing-giants-jets-focus-on-playoffs-not-rivalry.html	N/A	Todd Bowles	Coach	New York Jets	N/A	N/A	N	eight days (less than 3 weeks)	N/A	N/A
Pennington, B. (2015, December 4). Giants dealing with new injuries. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/05/sports/football/giants-dealing-with-new-injuries.html	N/A	N/A	N/A	N/A	N/A	N/A	N	two games (less than 3 weeks)	N/A	N/A
Hoffman, B. (2015, December 6). New York Jets at New York Giants preview. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/06/sports/new-york-jets-at-new-york-giants-nfl-pick.html	N/A	N/A	N/A	N/A	N/A	N/A	N	since November 22 (14 days) (less than 3 weeks)	N/A	N/A
Omalu, B. (2015, December 7). Don't let kids play football. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/07/opinion/dont-let-kids-play-football.html	N/A	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A
Shpigel, B. (2015, December 7). Todd Bowles and Jets see win over Giants as affirmation. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/08/sports/football/todd-bowles-jets-win-giants-affirmation.html	N/A	N/A	N/A	N/A	N/A	N/A	N	since November 22 (15 days) (less than 3 weeks)	N/A	N/A

Schonbrun, Z. (2015, December 10). Jets' Darrelle Revis hopes to return from concussion to face Titans. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/11/sports/football/new-york-jets-darrelle-revis-hopes-to-return-from-concussion-for-titans.html	"head injury" "hits to the head"	Darelle Revis, Todd Bowles	Player, Coach	New York Jets	N/A	N/A	N	the last two games (less than 3 weeks)	N/A	N/A
Pennington, B. (2015, December 11). Defender is swiftly waived by Giants. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/12/sports/nfl-roundup.html	N/A	Todd Bowles	Coach	New York Jets	N/A	N/A	N	since November 22 (three weeks) (3 weeks - 3 months)	N/A	N/A
Dykes, B. M. (2015, December 10). N.F.L. week 14 previews and picks. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/13/sports/football/nfl-week-14-previews-and-picks.html	N/A	N/A	N/A	N/A	N/A	N/A	N	two weeks (although it was actually three weeks) (less than 3 weeks)	N/A	N/A
Schonbrun, Z. (2015, December 12). 'You can't put ice over a migraine,' a lurking malady in the N.F.L. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/13/sports/football/migraine-headaches-a-lurking-malady-in-the-nfl.html	N/A	Dr. Tad Seifert	Neurologist	Norton Healthcare	N/A	headaches (headache/migraine), migraines (headache/migraine)	N	N/A	N/A	N/A
Schonbrun, Z. (2015, December 12). Titans at Jets matchup. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/13/sports/football/tennessee-titans-at-new-york-jets-matchup.html	N/A	N/A	N/A	N/A	N/A	N/A	N	two games (less than 3 weeks)	N/A	N/A
Dykes, B. M. (2015, December 13). Tennessee Titans at New York Jets Preview. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/13/sports/tennessee-titans-at-new-york-jets-nfl-pick.html	N/A	N/A	N/A	N/A	N/A	N/A	N	two weeks (less than 3 weeks)	N/A	N/A

Belson, K. (2015, December 13). How a boy's concussion death changed British sports. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/14/sports/rugby/tragedy-forges-alliance-for-change-in-concussion-protocol.html	"brain injuries resulting from a blow to the head or whiplash"	Peter Robinson, Barry O'Driscoll, Chris Nowinski, Dr. Willie Stewart, Unnamed, Lianne Brunton, Catriona Nimmo	Player's father, former head physician, co-founder, Foremost scientist, Coroner, Physical Therapist, Parent	British Rugby (general, not a team), World Rugby, Concussion Legacy Foundation, Concussions in Britain, Performed autopsy on Ben Robinson, Fife Rugby Club, Rugby players	loss of consciousness (LOC)	headaches (headache/migraine), memory loss (amnesia), dizziness (dizziness), sensitivity to light (sensitivity to light)	Y, confirmed	N/A	N, N	N/A, N/A
Meyers, N. J. (2015, December 15). N.H.L. this week: Rangers look to right the ship. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/16/sports/hockey/nhl-this-week-rangers-look-to-right-the-ship.html	N/A	N/A	N/A	N/A	N/A	N/A	N	one or two weeks (less than 3 weeks)	N/A	N/A
Berkman, S. (2015, December 18). Women's hockey bigger, faster and dire. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/20/sports/hockey/concussions-plague-womens-hockey-as-stars-are-sidelined.html	"head injuries"	Haley Irwin, Dr. Paul Echlin, Dr. Jeffrey Kutcher, Digit Murphy, Paige Decker, Lynn Kennedy, Josephine Pucci	Player, Researcher, Neurology Professor, Coach (former), Player (former), Player (former), Player (former)	Canadian Women's Olympic Ice Hockey team, Concussions, University of Michigan, Women's Ice Hockey, Yale Women's Ice Hockey Team, Yale Women's Ice Hockey Team, U.S. Women's Olympic Ice Hockey Team,	N/A	memory deficits (amnesia), headaches compared to barbed wire constricting the brain (headache/migraine), sensitivity to noise (sensitivity to sound), pains (other)	Y, Y, Y, Y, Y, Y, Y, Y, - confirmed, one suspected	since January (11 months) (3 months - 1 year)	N/A	N/A
Bruni, F. (2015, December 19). Being smart about your child's brain. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/20/opinion/sunday/being-smart-about-your-childs-brain.html	"trauma" "repetitive head injuries"	Dawn Comstock, Kevin Guskiewicz, Douglas Casa	epidemiologist, director, CEO,	Colorado School of Public Health, Matthew Gfeller Sport-Related Traumatic Brain Injury Research Center at the University of North Carolina at Chapel Hill, Korey Stringer Institute at the University of Connecticut	N/A	N/A	N	N/A	N/A	N/A

Rothman, S. M. (2015, December 22). Parents, stop obsessing over concussions. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/22/opinion/parents-stop-obsessing-over-concussions.html	"a temporary loss of consciousness after minor head trauma" (definition from 1977 standard medical text). "to include a variety of possible symptoms caused by mild head trauma, including headaches, amnesia and sensitivity to light and sound — but not necessarily loss of consciousness"	Dr. Steven Rothman	director	Pediatric Neurology at Washington University in St. Louis and the University of Minnesota	loss of consciousness (LOC)	headaches (headache/migraine), amnesia (amnesia), sensitivity to light and sound (sensitivity to light) (sensitivity to noise)	N	whole season (high school women's volleyball) (3 months - 1 year)	N/A	N/A
Koppelman, S. (2015, December 25). The risk of concussions from youth sports [Letter to the Editor]. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/25/opinion/the-risk-of-concussions-from-youth-sports.html	"hits to the head"	N/A	N/A	N/A	N/A	N/A	N	N/A	N/A	N/A
Belson, K. (2015, December 29). Concussion report highlights field maintenance. <i>The New York Times</i> . Retrieved from http://www.nytimes.com/2015/12/30/sports/football/concussion-report-highlights-field-maintenance.html	"head injuries"	Unnamed, Michael C. Meyers	Recent study, Professor,	Concussion Legacy Foundation, Department of Sport Science and Physical Education at Idaho State University	N/A	N/A	N	N/A	N	N/A

References

- Agenda-Setting theory. (2010). In D. Watts, *Dictionary of American government and politics*.
Edinburg, United Kingdom: Edinburgh University Press. Retrieved from
https://login.ezproxy.gvsu.edu/login?url=http://search.credoreference.com/content/entry/upamgov/agenda_setting_theory/0
- Ahmed, O. H., Sullivan, S. J., Schneiders, A. G. & McCrory, P. R. (2012). Concussion information online: evaluation of information quality, content and readability of concussion-related websites. *British Journal of Sports Medicine*, 46. 675-683. doi: 10.1136/bjsm.2010.081620.
- American Academy of Neurology. (2013). Concussion during sports activities. *American Academy of Neurology*. Retrieved from
https://www.aan.com/uploadedfiles/website_library_assets/documents/3practice_management/5patient_resources/1for_your_patient/6_sports_concussion_toolkit/summary.pdf
- Bakalar, N. (2005, October 18). Sports medicine: bad news for players hit in the head too often. *The New York Times*. Retrieved from <http://www.nytimes.com/2005/10/18/health/sports-medicine-bad-news-for-players-hit-in-the-head-too-often.html>
- Baugh, C. M., Kroshus, E., Bourlas, A. P., & Perry, K. I. (2014). Requiring athletes to acknowledge receipt of concussion-related information and responsibility to report symptoms: a study of the prevalence, variation, and possible improvements. *Journal of Law, Medicine & Ethics*. 297-313.
- Baugh, C. M., Kroshus, E. M., Daneshvar, D. H., Filali, N. A., Hiscox, M. J., and Glantz, L. H. (2015). Concussion management in United States college sports: Compliance with National

CONCUSSION CONTENT ANALYSIS

- Collegiate Athletic Association concussion policy and areas for improvement. *The American Journal of Sports Medicine*, 43(1). 47-56. doi: 10.1177/0363546514553090.
- Belson, K. (2016, July 25). N.F.L. introduces new rules to back its concussion protocol. *The New York Times*. Retrieved from http://www.nytimes.com/2016/07/26/sports/football/nfl-concussion-protocol-new-rules.html?_r=0
- Berkowitz, A. D. (2004). An overview of the social norms approach. Retrieved from <http://www.alanberkowitz.com/articles/social%20norms%20approach-short.pdf>
- Brain Injury Association of America. (2015). Mild brain injury and concussion. Retrieved from <http://www.biausa.org/mild-brain-injury.htm>
- Brown, D. A., Elsass, J. A., Miller, A. J., Reed, L. E. & Reneker, J. C. (2015). Differences in symptom reporting between males and females at baseline and after a sports-related concussion: a systematic review and meta-analysis. *Sports Medicine*, 45. 1027-1040. doi: 10.1007/s40279-015-0335-6.
- Buckley, T. A., Burdette, G. & Kelly, K. (2015). Concussion-management practice patterns of National Collegiate Athletic Association division II & III athletic trainers: how the other half lives. *Journal of Athletic Training*, 50(8). 879-888. doi: 10.4085/1062-6050-50.7.04.
- Cantu, R. C. & Gean, A. D. (2010) Second-impact syndrome and small subdural hematoma: an uncommon catastrophic result of repetitive head injury with a characteristic of imaging appearance. *Journal of Neurotrauma*, 27. 1557-1564. doi: 10.1089/neu.2010.1334.
- Centers for Disease Control and Prevention. (2003). National Center for Injury Prevention and Control. Report to Congress on mild traumatic brain injury in the United States: steps to prevent a serious public health problem. Atlanta (GA): Centers for Disease Control and Prevention.

CONCUSSION CONTENT ANALYSIS

Centers for Disease Control and Prevention. (2015). What is concussion? *Centers for Disease Control and Prevention*. Retrieved from

http://www.cdc.gov/headsup/basics/concussion_what.html

Centers for Disease Control and Prevention (n.d.) Concussion signs and symptoms checklist.

Retrieved from http://permanent.access.gpo.gov/gpo12273/TBI_schools_checklist_508-a.pdf

Chadehumbe, M. A. (2016). Neurologic care in concussion and post-concussive encephalopathy.

Current Problems in Pediatric and Adolescent Health Care, 46. 52-57. doi:

10.1016/j.cppeds.2015.11.004.

Concannon, L. (2016). Effects of legislation on sports-related concussion. *Physical Medicine and*

Rehabilitation Clinics of North America, 27(2). 513-527. doi:

10.1016/j.pmr.2015.12.006.

Concussion timeline. (n.d.) National Collegiate Athletic Association. Retrieved from

<http://www.ncaa.org/health-and-safety/sport-science-institute/concussion-timeline>

Coughlin, C. J., Myles, B. D., and Howitt, S. D. (2009). The ability of parents to accurately report concussion occurrence in their bantam-aged minor hockey league children.

Journal of the Canadian Chiropractic Association, 53(4). 233-250.

Davies, R. & McMillan, T. M. (2005). Opinion about post-concussion syndrome in health professionals. *Brain Injury*, 19(11). 941-947.

Ezell, L. (2013, October 8). WGBH Educational Foundation. Retrieved from

<http://www.pbs.org/wgbh/pages/frontline/sports/league-of-denial/timeline-the-nfls-concussion-crisis/#2005>

CONCUSSION CONTENT ANALYSIS

Gasquoine, P. G. (1998). Historical perspectives on postconcussion symptoms. *The Clinical Neuropsychologist*, 12(3). 315-324.

Gray, G. (2005, September 15). A glass jaw can be a matter of heart. *The New York Times*.

Retrieved from <http://www.nytimes.com/2005/09/15/sports/othersports/a-glass-jaw-can-be-a-matter-of-heart.html>

Hahn-Smith, S. & Springer, F. (2005). Social norms theory. *Prevention Tactics*, 8(9). 1-6.

Iadevaia, C., Roiger, T., & Zwart, M. B. (2015). Qualitative examination of adolescent health-related quality of life at 1 year postconcussion. *Journal of Athletic Training*, 50(11). 1182-1189. doi: 10.4085/1062-6050-50.11.02.

Kaiser Family Foundation. (2000). Do as I say, not as I do? *The Henry J. Kaiser Family Foundation*. (1-4). Retrieved from <https://kaiserfamilyfoundation.files.wordpress.com/2000/09/3070-sof-national-survey-of-kids-and-their-parents-about-famous-athletes-as-role-models.pdf>

Kerr, Z. Y. Register-Mihalik, J. K., Marshall, S. W., Evenson, K.R., Mihalik, J. P., & Guskiewicz, K. M. (2014). Disclosure and non-disclosure of concussion and concussion symptoms in athletes: review and application of the socio-ecological framework. *Brain Injury*, 28(8). 1009-1021. doi: 10.3109/02699052.2014.904049.

King, L. S. (1968). Signs and symptoms. *Journal of the American Medical Association*, 206(5). 1063-1065. doi:10.1001/jama.1968.03150050051011.

Kroshus, E., Garnett, B. R., Baugh, C. M., & Calzo, J. P. (2015). Social norms theory and concussion education. *Health Education Research*, 30(6). 1004-1013. doi: 10.1093/her/cyv047.

CONCUSSION CONTENT ANALYSIS

Kroshus, E., Kubzansky, L. D., Goldman, R. E. & Austin, S. B. (2014). Norms, athletic identity, and concussion symptom under-reporting among male collegiate ice hockey players: a prospective cohort study. *Annals of Behavior Medicine*, 49. 95-103. doi: 10.1007/s12160-014-9636-5.

Langlois, J.A., Rutland-Brown W., Wald M.M. (2006). The epidemiology and impact of traumatic brain injury: a brief overview. *Journal of Head Trauma Rehabilitation*, 21(5). 375–378.

League of Denial. (2016). About the book. *League of Denial*. Retrieved from <http://leagueofdenial.com/books/league-of-denial-tr>

Lystedt Law, The. (n.d.) The Lystedt Law, a concussion survivor's journey. *Centers for Disease Control and Prevention*. Retrieved from <http://www.cdc.gov/media/subtopic/matte/pdf/031210-Zack-story.pdf>

Martland, H. S. (1928) Punch drunk. *Journal of the American Medical Association*, 91(15).

Maske, M. (2016). The most dangerous man in football traded an NFL career for an internship. *The Washington Post*. Retrieved from https://www.washingtonpost.com/sports/the-most-dangerous-man-in-football-traded-an-nfl-career-for-an-internship/2016/06/07/8087971c-2c21-11e6-9b37-42985f6a265c_story.html?utm_term=.9243c3ff2d76

McCrea, M., Barr, W. B., Guskiewicz K., Randolph, C., Marshall, S. W., Cantu, R. . . .

Kelly, J. P. (2005). Standard regression-based methods for measuring recovery after sport-related concussion. *Journal of the International Neuropsychological Society*, 11. 58-69.

McCrory, P., Johnston, K., Meeuwisse, W., Aubry, M., Cantu, R., Dvorak, J., Graf-Baumann, T.,

CONCUSSION CONTENT ANALYSIS

- Kelly, J., Lovell, M., and Schamasch, P. (2005). Summary and agreement statement of the second international conference on concussion in sport, Prague 2004. *The Physician and Sports Medicine*, 33(4). 29-44.
- McCrory, P., Meeuwisse, W. H., Aubry, M., Cantu, B., Dvorak, J., Echemendia, R. J. . . . Turner, M. (2013). Consensus statement on concussion in sport: the 4th international conference on concussion in sport held in Zurich, November 2012. *British Journal of Sports Medicine*, 47. 250-258. doi: 10.1136/bjsports-2013-092313.
- McGannon, K. R., Cunningham, S. M. & Schinke, R. J. (2013). Understanding concussion in socio-cultural context: A media analysis of a National Hockey League star's concussion. *Psychology of Sport and Exercise*, 14. 891-899. 10.1016/j.psych.sport.2013.08.003.
- McLellan, T. L. & McKinlay, A. (2011). Does the way concussion is portrayed affect public awareness of appropriate concussion management: the case of rugby league. *British Journal of Sports Medicine*, 45. 993-996. doi: 10.1136/bjism.2011.083618.
- Meehan, W. P., Mannix, R. C., O'Brien, M. J., & Collins, M. W. (2013). The prevalence of undiagnosed concussions in athletes. *Clinical Journal of Sport Medicine*, 23(5). 339-342.
- Meehan, W. P., O'Brien, M. J., Geminiani, E., and Mannix, R. (2016). Initial symptom burden predicts duration of symptoms after concussion. *Journal of Science and Medicine in Sport*, 19. 722-725. doi: 10.1016/j.jsams.2015.12.002.
- Moor, H. M., Eisenhauer, R. C., Killian, K. D., Proudfoot, N., Henriques, A. A., Congeni, A. A. & Reneker, J. C. (2015). The relationship between adherence behaviors and recovery time in adolescents after sports-related concussion: an observational study. *International Journal of Sports Physical Therapy*, 10(2). 225-233.

CONCUSSION CONTENT ANALYSIS

- Omalu, B. I. (2004). Chronic traumatic encephalopathy and the national football league. *Journal of Neuropathology and Experimental Neurology*, 63(5). 535.
- Pellman, E. J., Viano, D. C., Casson, I. R., Arfken, C., & Feuer, H. (2005). Concussion in professional football: Players returning to the same game - part 7. *Neurosurgery*, 56(1). 79-92.
- Piland, S. G., Ferrara, M. S., Macciocchi, S. N., Broglio, S. P., and Gould, T. E. (2010). Investigation of baseline self-report concussion symptom scores. *Journal of Athletic Training*, 45(3). 273-278. doi: 10.4085/1062-6050-45.3.273.
- Prichep, L. S., McCrea, M., Barr, W., Powell, M., & Chabot, R. J. (2013). Time course of clinical and electrophysiological recovery after sport-related concussion. *Journal of Head Trauma Rehabilitation*, 28(4). 266-273. doi: 10.1097/HTR.0b013e318247b54e.
- Provvidenza, C., Engebretsen, L., Tator, C., Kissick, J., McCrory, P., Sills, A. & Johnston, K. M. (2013). From consensus to action: knowledge transfer, education and influencing policy on sports concussion. *British Journal of Sports Medicine*, 47. 332-338. doi: 10.1136/bjsm-2012-092099.
- Purcell, L., Harvey, J., & Seabrook, J. A. (2016). Patterns of recovery following sports-related concussion in children and adolescents. *Clinical Pediatrics*, 55(5). 452-458. doi: 10.1177/0009922815589915.
- Rose, S. C., Fischer, A. N., & Heyer, G. L. (2015). How long is too long? The lack of consensus regarding the post-concussion syndrome diagnosis. *Brain Injury*, 29(7-8). 798-803. doi: 10.3109/02699052.2015.1004756.
- Rubin, P. & Brenner, J. (2005, February). Head Case. *ESPN The Magazine*, 8(3). 42.

CONCUSSION CONTENT ANALYSIS

- Sivak, S., Nosal, V., Bittsansky, M., Dluha, J., Dobrota, D., & Kurca, E. (2016). Type and occurrence of serious complications in patients after mild traumatic brain injury. *Bratislava Medical Journal*, 117(1). 22-25.
- Snedden, T. R. (2013). Concept analysis of concussion. *Journal for Specialists in Pediatric Nursing*, 18(2013). 211-220. doi: 10.1111/jspn.12038.
- Stalnacke, B. M., Bjornstig, U., Karlsson, K. & Sojka, P. (2005). One-year follow-up of mild traumatic brain injury: post-concussion symptoms, disabilities and life satisfaction in relation to serum levels of S-100B and neuron-specific enolase in acute phase. *Journal of Rehabilitation Medicine*, 37. 300-305. doi: 10.1080/16501970510032910.
- Williams, R. M., Puetz, T. W., Giza, C. C. & Broglio, S. P. (2015). Concussion recovery time among high school and collegiate athletes: a systematic review and meta-analysis. *Sports Medicine*, 45. 893-903. doi: 10.1007/s40279-015-0325-8.
- Wilner, J. (2016). The NFL's concussion crisis: timeline. *The Mercury News*. Retrieved from <http://www.mercurynews.com/2016/01/30/the-nfls-concussion-crisis-a-timeline/>
- Wilson, M. F. (2010). Young athletes at risk: Preventing and managing consequences of sports concussions in young athletes and the related legal issues. *Marquette Sports Law Review*, 21(1). 241-292.
- Yang, J., Peek-Asa, C., Covassin, T. & Torner, J. C. (2015). Post-concussion symptoms of depression and anxiety in division I collegiate athletes. *Developmental Neuropsychology*, 40(1). 18-23. doi: 10.1080/87565641.2014.973499.

