

**Critical Review:**  
**Do Speech-Language Pathologists have a role in concussion management?**

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This review examined the research on the role of Speech-Language Pathologists (SLPs) in concussion management. The articles that were included in the review included informational reviews of the literature, reviews of concussion management protocols with case studies and survey studies. The theoretical models and current protocols provided suggestive evidence that SLPs should be involved in concussion management given their scope of practice and skill set. However the extent to which with the SLPs perceive themselves as ready to join this service is unclear given findings from the survey research. Recommendations for clinical practice and future research are discussed.

***Introduction***

A concussion is a mild traumatic brain injury (mTBI) that results from direct or indirect impact that causes the head and brain to move rapidly back and forth (Ontario Neurotrauma Foundation, 2013). Concussion and mTBI are terms that are often used interchangeable so for this review the term concussion will subsequently be used, acknowledging that some literature uses the term mTBI. Concussions can lead to change in mental status and can cause physical, behavioral and cognitive symptoms (Ontario Neurotrauma Foundation, 2013). Cognitive changes following a concussion can include difficulty with attention, memory, organization and insight (Ontario Neurotrauma Foundation, 2013). The definition of Cognitive Communication Disorders according to the College of Audiologist and Speech-Language of Ontario (CASLPO) is a set of communication features that result from underlying deficits in cognition (CASLPO, 2015). Given the type of symptoms following a concussion communication challenges may be present in individuals post concussion.

In 2013, 148,710 people were diagnosed with concussions in Ontario, a number likely to have grown given efforts to increase awareness of the importance of concussion diagnosis and treatment (Ontario Neurotrauma Foundation, 2017). Ontario was the first province to pass a concussion safety bill (Bill 193) on March 6<sup>th</sup> 2018 called Rowan's law, named after Rowan Stringer a 17 year old Ottawa rugby player who died from a head injury. The incident spurred a petition for the current legislation to provide more regulated management procedures for concussions in Ontario. As new legislation emerges, there is a need to define the roles of the concussion management team and specific procedures for return to play and school.

Most people who suffer a concussion will recover within 4-6 weeks, but persistent symptoms are reported in 15-20% of cases (Zemek et. al, 2016). Concussion

Ontario suggests that if concussion symptoms persist then treatment by an interdisciplinary team might be warranted (Ontario Neurotrauma Foundation, 2017). According to both the American Speech-Language-Hearing Association (ASHA) and CASLPO cognitive communication disorders falls in the Speech-Language Pathologist's (SLP) scope of practice, which can include assessing and treating individuals with traumatic brain injury. Given SLP's scope of practice, they appear well equipped to be involved in interdisciplinary concussion management teams. Nevertheless, the extent to which SLPs perceive themselves as ready to join this service is unclear.

The field of concussions and concussion management is still relatively new and therefore information regarding the role of SLPs is still emerging. As result available empirical evidence regarding SLPs involvement in concussion management is expected to be quite minimal. Nevertheless, researchers at the forefront of this work can draw on a wealth of related evidence to inform practice in the emerging field of concussion management. For example, a rich research base exists in the area of traumatic brain injury and cognitive communication disorders (Tougher et al., 2014). Within the context of the emerging area, the purpose of the critical analysis reported in this review was to examine available literature informing the role of SLPs in concussion management. Reports of current practice, and opinions and attitudes regarding working with this population as well as evidence-informed frameworks for service provision will help to determine the potential contribution of SLPs to concussion management.

***Objectives***

The primary objective of this paper was to critically review the literature to determine what role SLPs have in concussion management and if they feel prepared to assess and treat patients with concussions.

## ***Methods***

### Search Strategy

A variety of computerized databases, including, PsychINFO, Scopus and ASHA Journals were searched using the following terms: [(Concussion) OR (Mild Traumatic Brain Injury) AND (Speech-Language Pathology) OR (Speech-Language Pathologist) AND (Management) OR (Role) AND (Sports)].

### Selection Criteria

Articles were included in this review if they addressed theoretically how a SLP could be involved in concussion management, or current practices with patients with concussions. Articles that looked at specific treatments that SLPs use with individuals with concussion were not included.

### Data Collection

Papers included in this review included informational reviews of the literature (3), reviews of concussion management protocols with case studies (2) and survey studies (3).

## ***Results***

### Informational Reviews of the Literature

Given the emerging evidence of this topic informational reviews of the literature can provide good overviews and theoretical models of how SLPs may be involved in concussion management by using related research to inform practice thereby providing suggestive evidence. However, these reviews should be interpreted with caution because a critical review of the supporting research is often not included, and the available research might not directly address the population of interest.

**Crawford and Sirmon-Taylor (2014)** outlined how SLPs might provide services to patients who have suffered a concussion along the continuum of care from acute care to outpatient rehabilitation. They provided their opinion with little evidence to support their claims on how SLPs should be involved in assessment and treatment of patients with concussions and post-concussion syndrome. Suggestions were provided (with logical rationale) on the types of treatments SLPs could use including attention training, memory treatment, compensatory strategies, self-monitoring and pragmatics training. The authors did reference types of treatments that have been used with certain deficits known to occur in patients with Traumatic Brain Injury (TBI), however there was no comment on if these had previously been found effective.

This article provides theoretical suggestions as to the roles of SLPs in concussion management with little research support; therefore overall this article provides limited evidence for this role.

**Duff (2009)** provided general information regarding concussions, a summary of current practices of concussion management and highlighted why SLPs are equipped to work with children and adolescents with sports-related concussions. Melissa C. Duff is an expert SLP in the area with several publications on the topic of TBI. Summaries of current concussion management practices related to concussion severity and return to play guidelines were referenced using widely cited and known sources. Drawing on this research and her own expertise, the author provided a compelling argument for the role of SLPs in promoting awareness and prevention of concussions, and working with students in the transition back to school.

This positional paper provided suggestive evidence that SLPs have a role in concussion management with children and adolescents with sports related concussions.

**Salvatore and Sirmon Fjordbak (2011)** reviewed the literature on concussions and highlighted how SLPs would fit into an interdisciplinary team approach to concussion management. Both authors are experts in the area with relevant publications. A relevant and broad review of the literature is provided regarding the changes that result from injury and the recovery process. Drawing on this research and their own expertise, the authors delineated how the scope of practice, skills and current roles of SLPs makes them well suited to be involved in the assessment and treatment of concussion. A case study of a 15-year-old boy who suffered a concussion as a result a sport injury and his recovery process was included, however no explicit evidence as to how an SLPs involvement would have improved the concussion management was provided.

This review of the literature provided good rationale and suggestive evidence to support the role of a SLP in concussion management as part of an interdisciplinary team.

### Concussion management protocols with Case Studies

These articles outline concussion management protocols that are currently being implemented with SLPs as an integral part of the team. There is no empirical evidence yet of the effectiveness of these protocols however, some evidence for the success of the protocols are demonstrated through cases studies.

**Knollman-Porter, Constantinidou and Hutchinson-Marron (2014)** outlined the Miami University's concussion management protocol that involves collaboration between the Athletic Trainers (AT) and

SLPs. This article provided a comprehensive overview of the evidence that drove the development of an interdisciplinary concussion management team and their practices. The protocol was developed using evidence and best practice guidelines to dictate the educational component, best assessment tools, and best post-concussion monitoring procedures to promote successful return to play and school following a concussion. In this protocol SLPs are involved in baseline and post-concussion assessment, monitoring recovery through frequent reassessment, and providing academic accommodations while working closely with the AT.

The success of the protocol is demonstrated through two case studies, which show how the protocol worked to re-integrated two athletes post-concussion. Both case studies are described in sufficient detail to understand how the protocol was applied and the roles of each team members.

Overall this article provided compelling evidence that the integration of a SLP into a interdisciplinary team for concussion management for student athletes is good practice and contributes to successful return to play and school.

**Dachtyl and Morales (2017)** described the development and implementation of an academic concussion management protocol known as Cognitive Return to Exertion (CoRTE<sub>x</sub>). The protocol was based on other established protocols (e.g., Knollman-Porter et. al., 2014) and known concussion guidelines, and was developed to facilitate academic success in students post-concussion (Pre-Kindergarten to grade 12). An interdisciplinary team approach is employed with an SLP at the school acting as the primary contact. The protocol focuses on education, academic accommodations and supported transitions back to school and play. The rationale for the design was supported by evidence in the literature. During the piloting phase of the protocol, the SLP who was developing the framework collaborated with and received feedback from many other professionals that would be involved with children with concussion.

A case study was included to show the effectiveness of the program. The role of the SLP was embedded throughout the CoRTE<sub>x</sub> service. The authors argued that such anecdotal evidence is the best method for assessing outcomes at the present due to variable nature of individuals with concussion.

This article provides suggestive evidence that SLPs can have a primary role in a interdisciplinary team acting as a team lead to coordinate collaborative care between

professionals and assist students in their return to school and play.

#### Survey Studies

Survey studies provide objective information on people's knowledge, attitudes, beliefs and behaviours. Nevertheless, survey responses can suffer from being bias related to participant expectations. In an emerging field such as concussion management, survey results can provide information on areas that require further education or research.

**Duff, Proctor and Haley (2002)** conducted a survey study to determine how individuals with concussion are assessed, referred to and from an SLP, what treatment these individuals receive, how families are educated about concussion and the follow-up procedures. Surveys were mailed to nearly 500 SLPs across 2 states and determined to provide a representative sample of SLPs working in the United States according to ASHA's membership data. Response rate was 45% of which 30% met the researchers criteria of having worked in the area within the last 3 years. This response rate is within the typical range for this kind of research. The survey consisted of a mixed format of questions that was reviewed by six practicing SLPs to ensure the face validity of the survey and their feedback was used to develop the final version of the survey. Responses were analyzed descriptively. The responses suggested that assessments commonly used do not capture subtle changes following a concussion, individuals with concussions are not commonly referred to SLPs, and there are few evidence supported specific treatment options. As well it was indicated that SLPs would benefit from more education and training to be better equipped to work with this population.

This article provides suggestive evidence that SLPs are currently working with patients who have suffered a concussion but would benefit from more research and training to determine and implement the best practices for this population.

**Duff and Stuck (2015)** conducted a survey study to establish the current knowledge and practices related to pediatric concussions of school-based SLPs. The authors aimed at capturing an accurate sample of SLPs in the United States by distributing a 1000 surveys to 10 states that represented the diverse geographical regions and the density of SLPs working across the country. Although representative of the United States, the sample may not be reflective of SLPs working outside of the United States. Response rate was 28%, a rate common for this type of research.

The survey consisted of mixed format questions. Prior to distribution the survey was shown to four SLPs and four graduate students to ensure face validity of the questions. As all respondents did not necessarily answer all the questions on the survey there were different sample sizes for each question, therefore the data were interpreted descriptively. The authors compared the responses between those that had received training in concussion management and those that had not to see if there was a difference between these groups. Results indicated that there is a need for more education for SLPs on pediatric concussions, that SLPs have a mix of accurate and inaccurate knowledge, there is a lack of communication between professionals about students with concussions, and that assessment tools are not sensitive enough to capture deficits. There was some indication that SLPs that had concussion education had more knowledge regarding concussions and appropriate management, although there was no statistical difference between the groups.

Overall this study provides suggestive evidence that there are gaps in the knowledge base and tools available for SLPs working with pediatric concussions in the school.

**Hux, Walker and Sanger (1996)** surveyed SLPs working in the school on their knowledge and self-perceptions of providing service to students with concussion. The survey was distributed to 1,000 SLPs in 10 different states to get a diverse sample of different geographical regions of the United States. Response rate was quite good at nearly 50%. The survey was a mixed question format that included 65 items, which gathered information on: SLPs professional background, the services they provide to students with TBI, their knowledge of concussion and their opinions about working with students with concussion. The survey was reviewed by ten SLPs to provided feedback regarding question ambiguity and organization to ensure face validity before the final version was distributed. Given the publication date of this survey study the results may not accurately reflect practices today.

Approximately 50% of those that responded had received specific training on concussion/TBI and some of these differences in training were dependent on the state in which they resided. Appropriate statistical analyses were used to determine if there were differences between the responses of those that had or had not received concussion/TBI education or training. Results revealed that SLPs working with students with concussions did not feel confident in working with these students and that there is a lack of consensus on whose role it was to work with these children. SLPs

that had training were significantly more confident in providing services to students with concussions. Generally training improved SLPs knowledge about concussions though both groups still held misconceptions regarding concussion classification and the assessment and treatment needs of students with concussion.

Overall, this article provides limited evidence regarding current practices and opinions on the role of SLPs in concussion management.

### *Discussion*

Overall, the articles reviewed in this paper provided suggestive evidence that SLPs have a role in concussion management because of SLP's knowledge of cognitive communication, knowledge of standardized assessment procedures and SLPs location in schools. Anecdotal evidence from current concussion protocols indicates that SLPs involvement in an interdisciplinary team has a positive outcome on student's return to play and school. The findings from the survey research suggested that even though SLPs acknowledge that concussion management is in the scope of practice there are gaps in their knowledge regarding concussions, including assessment and treatment of this population.

The articles present ideas about how SLPs could be involved in concussion management. Recommendations from the articles suggest that SLPs could potentially be involved in concussion management by being team leads for students in schools, conducting baseline and post-concussion assessment, advocating for services, and promoting concussion awareness. As well as being involved in more traditional intervention such as assessing and treating cognitive communication disorders resulting from persisting post-concussion syndrome.

The survey research provided insight into the effects of concussion education on SLPs ability to be involved in concussion management by comparing groups with and without concussion education. There was some suggestive evidence those with more education on concussion had more knowledge and were better able to manage students with concussion.

### *Clinical Implications*

The evidence suggests that SLPs should be involved in concussion managements because of their skill set and scope of practice, though they would benefit from addition training and education that is specific to concussion. As well further research is needed to determine if SLPs involvement has a positive effect on outcomes and what role they should have on an

interdisciplinary team compared to other team members.

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