Brief Commentary
In their review of recent research, Emhoff and McCaffrey highlight the importance of considering the individual's psychological functioning as part of the overall picture in return-to-play or return-to-activity decisions. Particularly for individuals who experience protracted recovery periods, psychological factors play an important role in their recovery as post-concussive symptoms have been found to be greatly influenced by factors such as anxiety and depression. When assessing a patient’s cognitive performance after a sustained injury, the individual’s psychological state can affect an
individual’s motivation and ability to perform optimally. Recognizing the importance of this relationship, as part of the multi-disciplinary approach to concussions all individuals should be screened with well standardized measures of psychological functioning such as an omnibus measure of personality (i.e. Psychological Assessment Screen; Morey, 1991) or other such tools appropriate for the age of the individual being assessed. If an individual is experiencing psychological symptoms, a referral to a trained mental health professional is appropriate.

ImPACT used in conjunction with appropriate measures of psychological functioning can provide valuable insights to the healthcare professional about the neurocognitive and psychological status of the individual immediately after they are injured as well as during their recovery period.

Research
While post-concussive symptoms are typical in the acute stage of a mild traumatic brain injury (mTBI), persistence of these symptoms is problematic and can cause significant impairment (Carroll et al., 2004). For most individuals, the symptoms resulting from concussion/mTBI remit within the span of several days to three months (Carroll et al., 2004). Somatic, cognitive, motor, and affective symptoms that persist beyond the typical recovery period are referred to as Postconcussion Syndrome (PCS; Ponsford et al., 2012). An important focus of research has been to identify factors that contribute to the persistence of symptoms and ultimately target individuals that are at risk for prolonged recovery. Until recently, research into predictors for long-term PCS has focused on prior history of concussion and injury-related factors (i.e. duration of loss of consciousness, initial Glasgow Coma Scores) (Carroll et al., 2004; Ponsford et al., 2012). Currently, researchers have started to examine the contributions of psychological factors to the persistence of post-concussive symptoms past the typical timeframe (Carroll et al., 2004).

Early research into psychological factors focused on the role of depression, with findings indicating that depression may increase the risk for delayed recovery following mTBI (Ponsford et al., 2000; Grubenhoff et al, 2016). However, recent studies suggest that other psychological factors may be more important predictors of persistent symptoms. When examining both depression and anxiety as predictors of persistent post-concussion symptoms following mTBI, Wojcik (2014) found that history of anxiety emerged as a stronger predictor of persistent symptoms than depression. Additionally, in a study examining predictors of postconcussion-like symptom reporting within a non-clinical sample, alcohol consumption, sleep difficulties, mental fatigue, stress, and anxiety all emerged as stronger predictors for postconcussion-like symptom reporting than depression (Balasundaram, Athens, Schneider, McCrory, & Sullivan, 2016). Similarly, Edmed and Sullivan (2012) found that stress emerged as a stronger predictor of postconcussion-like symptom reporting than depression.

Since psychological factors can relate to both pre-injury and post-injury functioning, there is a need for research jointly examining the influence of pre-injury, injury-related, and post-injury factors on outcomes following mTBI. In one such study, Ponsford and colleagues (2012) found that mTBI predicted PCS during the acute phase, but not at three months. Furthermore, they found that pre-injury psychiatric conditions and post-injury anxiety were the strongest predictors of persistent symptoms at three-months. These findings suggest that injury-related factors may be important contributors to PCS in the early stages following injury, whereas psychiatric factors may be more important for persistence of symptoms. However, these results are somewhat contradictory to earlier research that found preexisting affective or anxiety disorders to be stronger predictors of acute PCS than mTBI (Meares et al., 2008). Despite these somewhat contradictory findings, both of these studies highlight the influential role of psychological factors in post-concussion recovery.

Due to the influence of psychological factors at both pre- and post-injury, it is possible that PCS interacts with psychological factors. Researchers found that greater PCS reporting was associated
with individual anxiety levels at one week post-injury, which was in turn associated with pre-injury history of psychiatric conditions (Ponsford et al., 2012). The authors conclude that individuals with a pre-injury psychiatric history may respond to the injury and accompanying PCS with greater anxiety, which in turn exacerbates their PCS. Thus, it seems that psychiatric conditions may play a role in the development of post-concussive symptoms as well as function to maintain symptoms and prolong recovery.

Until recently, the majority of research into psychological factors has been conducted with adult samples. Research with children and adolescents is emerging and the results seem to support the findings in the adult literature. Among children and adolescents, pre-injury stressful life events are related to prolonged recovery (Smyth et al., 2014). Grubenhoff and colleagues (2016) found that children with delayed symptom resolution had higher pre-injury somatization scores and higher post-injury anxiety scores when compared to children who experienced early symptom resolution. Interestingly, in this same study, researchers found that all participants with abnormal CT scans (complicated mTBI) belonged to the early symptom resolution group. While these findings should be cautiously interpreted as the number of individuals with abnormal CT scans was very small (N=5), they do align with another study that examined CT scans in relation to mTBI outcomes. Lannsjö and colleagues (2013) found that traumatic head CT scan pathology had no effect on self-reported outcomes at three months post-mTBI. These findings suggest that more severe traumatic brain injury, as indicated by abnormal CT scans, may be a less important predictor for delayed symptom resolution than other factors.

A unique consideration in child and adolescent mTBI recovery is the role of parents and other caregivers. Olsson and colleagues (2013) found that higher levels of pre-injury parental anxiety predicted increased post-concussion symptoms at six months post-injury among children with complicated mTBI. Similarly, these researchers found that lower pre-injury parental anxiety was associated with a reduction in children’s post-concussion symptoms between 6-18 months post-injury. This study suggests a need for further investigation of environmental factors influencing mTBI recovery.

The aforementioned studies on psychological factors in relation to post-concussion symptoms suggest that early identification of individuals at risk for persistent PCS is possible. To accomplish this, pre-injury measures of psychological functioning should be collected in order to identify individuals in need of early referral to specialists following concussion (Grubenhoff et al, 2016; Ponsford et al, 2012). Furthermore, when managing concussion, health care professionals should be mindful that the etiology of post-concussion symptoms is not solely attributable to incomplete mTBI recovery and may instead be indicative of pre-existing psychological disorders (Grubenhoff et al, 2016).

The emerging interest in studying psychological factors in relation to mTBI has prompted researchers to investigate the effect psychological conditions have on concussion-like symptom reporting (Iverson et al., 2015). Current literature suggests that individuals with psychiatric conditions and no history of head injury report a higher number of post-concussion-like symptoms (Edmed & Sullivan, 2012; Iverson et al., 2015). Specifically, Iverson (2006) found that approximately 90% of patients with depression and no history of head injury met liberal self-report criteria for PCS. In a recent study, Iverson and colleagues (2015) found that, among males, prior treatment of a psychiatric condition was the largest predictor of symptom clusters that resemble PCS, followed by having a history of migraines. Interestingly, for both males and females, history of prior concussions emerged as the weakest independent predictor of postconcussion-like symptoms. These results align with prior research and suggest that
psychological factors may be more important predictors of PCS than history of concussions or injury-related factors. The authors conclude that, while prior concussions are associated with baseline concussion-like symptom reporting, this association is relatively weak in comparison to the association between concussion-like symptom reporting and preexisting psychiatric conditions (Iverson et al., 2015).

The clinical implications of these findings suggest that health care professionals should exercise caution when relying solely on post-concussion symptom instruments for decisions regarding concussion management and return-to-play as these scores may be impacted by psychological conditions (Balasundaram et al, 2016). Balasundaram and colleagues (2016) recommend incorporating psychological measures into baseline and post-concussion assessments, which typically only assess for PCS. Furthermore, they contend that incorporating these measures would prevent both premature return-to-play decisions and unnecessary withholding from activity. Current research indicates that psychological factors are influential in both baseline symptom reporting and post-concussion recovery. Recommendations for future studies are to incorporate psychological variables into research examining post-concussion outcomes.

References:


