Concussion and the Student's Return to the Classroom

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The term “concussion” is often loosely used in conversation and/or diagnoses given by healthcare providers (McCrory et al., 2017). An unclear understanding of a concussion can lead to discrepancies in care and return to activities. A concussion is defined as an injury to the brain, often related to a bump or blow to the head or a jolt to the body, causing the head and brain to move rapidly (Centers for Disease Control and Prevention [CDC], 2017b).

Concussions in the pediatric-age (<12 years) and adolescent (12–18 years) populations are continuously underreported (Hallowstead & Walter, 2010; Karlin, 2011). Recently, sports-related concussions have also been identified as a significant public health concern among youth (Valovich McLeod, Wagner, & Welch Bacon, 2017). According to the CDC, the prevalence of concussions resulting in emergency department visits continued to increase from 2001–2010 for the age groups of 0–4 years old, 5–14 years old, and 15–19 years old.

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old, and 15–24 years old (CDC, 2016). According to the same CDC report, the number of hospitalizations (i.e., admission for extended hospital stay) for these age groups has decreased along with the number of deaths related to concussions (CDC, 2016). Increased awareness and proper management of concussions may have contributed to the decreased hospitalizations and deaths related to concussions.

A concussion sustained during an important developmental stage in life requires careful attention, education, care and guided return to learning and activity because the brain of a youth or adolescent is more susceptible to the effects of a concussion compared to a mature adult brain (Halstead & Walter, 2010). Many of the commonly reported concussion symptoms (i.e., headache, sensitivity to light/noise, difficulty remembering and/or concentrating) are quickly exacerbated by the student’s daily activities, including school, participation in physical education, and social activities (Valovich McLeod et al., 2017). Research emphasizing the effect of concussions on academic performance provides further insight into the students’ perceived and lived experiences related to concussions (Valovich McLeod et al., 2017; Halstead et al., 2013; Russell et al., 2016; Wasserman, Bazarian, Mapstone, Block, & van Wijngaarden, 2016).

Currently, there is a lack of education provided to physical educators on concussion identification and management, as the standards for physical education teacher education do not address concussion content (SHAPE America – Society of Health and Physical Education, 2017). Literature is often directed toward coaches and athletic support personnel (American Academy of Pediatrics [AAP], 2017; Kasamatsu, Cleary, Bennett, Howard, & Valovich McLeod, 2016; McCrory et al., 2017); however, not all physical educators are involved in athletics. The purpose of this article is to provide information on the prevalence, recognition and management of concussions in the pediatric and adolescent populations who participate in physical education.

Prevalence of Concussions

It is likely that the true incidence rate of concussions in the pediatric population is underestimated and underreported by the child, coach, athletic trainer, and other medical professionals (Karrlin, 2011). Often there is a lack of education and awareness, and difficulty identifying concussion symptoms by the child, parents/guardian, and coaches. Concussions can go undetected, undiagnosed, and poorly managed due to several factors: (1) the child’s desire to “push through” the concussion symptoms, (2) a failure to follow up with a healthcare provider (e.g., athletic trainer, physician) due to lack of patient compliance, (3) lack of resources, or (4) the fear of losing participation time in various activities (Colvin et al., 2009).

With concussion research on the rise, more knowledge is continuously made available on the effects of concussion in various populations (Broglio et al., 2014; Guskiewicz et al., 2004; McCrory et al., 2013; McCrory et al., 2017). The literature uses several terms related to head injuries (e.g., traumatic brain injury [TBI], concussion, head injury, sports-related concussion); however, the use of these different terms does not change or negate the fact that any disruption of the neurophysiological aspect of the brain can greatly impact the person instantly and over time. For example, sex differences in concussion symptoms were examined in high school athletes (Frommer et al., 2011). Males reported to more frequently have amnesia and confusion/disorientation compared to females, while females reported drowsiness and sensitivity to noise more often than males (Frommer et al., 2011). Additionally, males returned to participation within seven to nine days post-concussion, while females returned sooner, within three to six days post-concussion (Frommer et al., 2011). It is imperative for the general population to be able to identify the most commonly reported symptoms of a concussion and the likelihood of disruption to normal activities of daily living, including traditional classroom and physical education involvement.

Concussion Identification and Management

Suspecting a Concussion. Physical educators have a unique and valuable interaction and relationship with students, whether in the physical education class or in competition. Serving the students in this capacity allows the physical educator to establish, foster and maintain professional relationships with students. If a student is not acting in a typical manner that is considered “normal” for that student or reports feeling “off,” further inquiry should take place. The educator should note his or her observations and/or full disclosure of a concussion diagnosis if available, ask the student a few probing questions to assess his or her current status, and communicate with parents or guardians to determine whether the student should participate in class activities (i.e., when, how, progression). Due to the limited research available on the role of the physical educator in the management of students with concussions in the classroom (Kolodziej & Ploeg, 2016), further recommendations are needed to guide classroom management. Therefore, recommendations provided in this article are related to symptom identification, use of basic instruments for early detection of a concussion, and management of the classroom.

Signs and Symptoms. Students may try to “push through” activities no matter how they are feeling, or may lack the confidence or comfort to report their symptoms due to the desire to impress a coach or educator. Along with school personnel, students need to be educated, in an age-appropriate manner, regarding concussions and associated symptoms. Once educated, the students need to be empowered to tell a coach or educator how they are feeling in order for parents or guardians to be notified and for a medical evaluation to occur. Additionally, it is important for educators to feel comfortable and educated to an appropriate degree to ask students how they are feeling and ask probing questions related to common symptoms.

Screening for a Concussion. Since a concussion can cause neurological and cognitive changes, the recognition of signs and symptoms can be easy in some cases and extremely difficult in others. Symptoms can vary for each individual with regard to timing, number and type of symptoms, severity, and associated triggers that exacerbate the symptoms. Commonly reported signs and symptoms related to concussions are found in Figure 1. Symptom inventories yield some limitations regarding effectiveness and efficiency because symptoms may not appear immediately after the injury nor have a physical presentation (Oberlander, Olson, & Weidauer, 2017). Therefore, the use of a symptom inventory should be in conjunction with another screening tool.

Screening tools used to screen for concussions include symptom inventories, clinical evaluation, and functional testing. Symptom inventories are a simple tool to screen for a concussion and are often used in high school and middle schools. These tools should be used in conjunction with other assessment tools for the most accurate assessment. Clinical evaluation is a tool that involves more of an immersive approach to evaluate if a concussion has occurred. Functional testing is a tool that measures the impact of the concussion on the student’s performance. Functional testing is typically used in high school and college athletes to assess the impact of the concussion on performance and readiness to return to play.
and use, as well as who should administer it. It is important to reiterate that concussion evaluation and screening tools are typically administered by qualified and trained healthcare providers. However, several tools are available (e.g., information flyers, symptom checklists, King-Devick sideline test) that can be administered by educators and school administrators (CDC, 2015, 2017a; Galetta et al., 2011; King-Devick technologies, Inc., 2018).

- The Matrix Medical Communications (MMC) concussion test is a self-administered baseline test that can be taken at home for a small fee (MMC Concussion Tests, 2016). The test has been designed to assess the following areas: (1) verbal memory, (2) visual memory, (3) finger tapping, (4) symbol digit coding test, (5) Stroop test (i.e., response to colors and words), (6) shifting attention, and (7) continuous performance. Obtaining baseline measures provides the healthcare provider with information for comparison after a concussion occurs. The MMC offers free, unlimited follow-up testing under physician supervision after injury. It is important to understand that the MMC concussion test alone does not provide enough information to make return-to-play or return-to-learn decisions.

- The King-Devick (KD) sideline test, originally designed in the 1970s as a screening to identify learning disabilities and reading fluency concerns caused by saccadic rhythm changes in the adolescent population, is now used to evaluate concussions (Oberlander et al., 2017; Leong et al., 2014; Oride, Marutani, Ouse, & DeLand, 1986; Kulp & Schmidt, 1997a, 1997b, 1998). The KD test records the number of errors and time to complete the assessment to determine the severity of the diagnosis — a slower time and/or more errors may support a concussion diagnosis (Oberlander et al., 2017). Research supports the KD test and notes its high test-rest reliability from day 1 to day 45 (Oberlander et al., 2017); therefore, consistency has been determined for the assessment tool.

The MMC concussion test and KD sideline test are both noted to evaluate a potential concussion beyond a symptom inventory checklist. Utilizing two or more screening tools will assist the educator in making important and timely decisions regarding the student’s ability to continue participating in activities.

**Removal from Participation**

As a physical educator the primary goal is to provide students with a safe learning environment while encouraging students to be active at a health-enhancing level (SPARK, 2016). Accidental
contact between students and/or between a student and another surface can occur at times in the physical education setting. Physical educators need to be vigilant in surveying students as they engage in activity. The nature of physical activity itself may cause a forceful blow or rapid movements to the head or body, resulting in changes to the student’s behavior, thinking, and/or physical functioning and, ultimately, producing a concussive episode (CDC, 2015). Alterations in behavior and present signs or symptoms will require a student to be removed from activity and to be evaluated by a trained healthcare provider. Some concussion prevention can occur from an educational perspective by carefully planning activities to be included in lesson plans. Educators should also have a clear understanding of each student’s cognitive, emotional and physical traits and tendencies in order to recognize any variations as a result of class activities.

The adolescent brain takes at least twice as long (10–14 days) to return to pre-concussion baseline values on neurocognitive testing compared to adult brains (3–5 days; Field, Collins, Lovell, & Maroon, 2003; Grady, 2010; Pellman, Lovell, Viano, & Casson, 2006). Therefore, students should be removed from activity when an obvious mechanism for a concussion has been observed by the educator; if the student demonstrates cognitive, emotional or physical changes or impairment related to the observed or reported injury; and/or if the student reports having symptoms previously identified in Figure 1 related to a head injury. Resources are also available to assist with the recognition of various symptoms or key markers that would indicate that the student may have sustained a head injury and needs further evaluation, including the CDC HEADS UP fliers (CDC, 2015) and recommendations provided by the AAP (2017), National Athletic Trainers’ Association (NATA, n.d.), and the most recent Zurich Consensus Statement (McCrory et al., 2017).

Once a concussion or head injury is suspected, it is recommended to communicate with several stakeholders to ensure the student is cared for properly. Key stakeholders in the student’s care include but are not limited to: (1) school athletic trainers, (2) school nurses, (3) parents/guardians, (4) physicians, and (5) educators. Creating open communication and transparency among these individuals will hopefully allow for a more fluid process in facilitating the student’s return to the classroom and physical activity.

If a student sustains a concussion during physical education, the educator should use the forms provided (Figures 2–4) to share information with the parents/guardians regarding the recent incident. Included within each form (Figure 2) is information about concussions, commonly reported symptoms in the general population, possible symptoms reported by the student (if any), and recommendations for evaluation by a healthcare provider (Figure 3). Additionally, a return-to-classroom activity form (Figure 4) is provided that a physician and/or athletic trainer can complete to clear the student for the return to physical activity.

The referral process can never be instituted too quickly; therefore, if the educator suspects that a head injury occurred, or the student is displaying commonly associated signs and symptoms of a concussion, further evaluation by a healthcare provider is recom-

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Brief Explanation</th>
<th>Individual to Use Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>King-Devick Test&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Remove-from-play sideline concussion screening test that captures impairment of eye movements and other neurological impairments</td>
<td>Educator, coach, parent/guardian, healthcare professional</td>
</tr>
<tr>
<td>SCAT 5 or Child SCAT 5&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Standardized concussion evaluation tool. Requires at least 10 minutes to complete the assessment</td>
<td>Only physicians and licensed healthcare providers</td>
</tr>
<tr>
<td>Informational Fliers&lt;sup&gt;c&lt;/sup&gt;</td>
<td>Fliers that provide information regarding signs and symptoms, warning signs, emergency referrals, etc.</td>
<td>Educator, coach, child, parent/guardian, healthcare professional</td>
</tr>
<tr>
<td>Symptoms Checklist&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Overview of commonly reported symptoms related to the presence of a concussion</td>
<td>Educator, coach, child, parent/guardian, healthcare professional</td>
</tr>
<tr>
<td>Concussion Vital Signs&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Free computerized assessment available online for patients to complete; designed to identify symptoms and areas of deficiency related to neurocognitive performance</td>
<td>Healthcare professional&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>MMC Concussion Tests&lt;sup&gt;f&lt;/sup&gt;</td>
<td>Self-administered computerized evaluation tool. Results are available immediately that can be shared with a healthcare professional</td>
<td>Student, student-athlete, coach, educator</td>
</tr>
</tbody>
</table>

<sup>a</sup> King-Devick technologies, Inc. (2018); Galetta et al. (2011).
<sup>b</sup> McCrory et al. (2017).
<sup>c</sup> CDC (2015).
<sup>e</sup> Healthcare professional is defined, but not limited to, an athletic trainer, physician, nurse practitioner, physician assistant, neuropsychologist, and nurse practitioner.
<sup>f</sup> MMC Concussion Tests (2016).
mended. The referral process and preliminary management of a concussion is outlined in Figure 5.

**Returning to the Classroom**

When it is suspected that a student has suffered a concussion, the physical educator’s role is to follow state and/or district return-to-learn policies. The return-to-learn policy has been designed to allow the student to rest, promoting a healing environment for the brain, which ultimately aids in symptom resolution. Common symptoms reported by adolescents include headaches, dizziness, sensitivity to light/noise, fatigue, trouble sleeping, and difficulty concentrating and remembering (Valovich McLeod et al., 2017). The student may begin the return to activity and learning progression once symptoms have decreased and a healthcare provider (e.g., medical doctor, doctor of osteopathic medicine, certified ath-

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**Figure 2.**

Note sent home by educator

Dear Parent/Guardian,

Your child, ___________, may have sustained a concussion during physical education today ______. He/she has displayed symptoms that are consistent with a concussion. Below are resources for identifying symptoms. Before your child can return to activity in physical education, an evaluation must be completed by a medical professional (e.g., physician, certified athletic trainer, nurse practitioner, physician assistant, neuropsychologist). Medical clearance must be determined by the medical professional in order to be cleared for activity.

- Exhibited signs of a possible concussion
- Sent to the _____________ (i.e., school nurse, athletic trainer) for evaluation
- Needs evaluation and clearance by a medical professional before the student may return to physical education.

For more information regarding a concussion, please visit the Centers for Disease Control and Prevention HEADS UP website at: https://www.cdc.gov/headsup/youthsports/parents.html

If you have any questions please contact me, or the school nurse, at [INSERT SCHOOL PHONE NUMBER].

Sincerely,

[EDUCATOR’S NAME]

[INSERT CONTACT INFORMATION]

Source: CDC (2015)

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**Figure 3.**

Form to be filled out by a healthcare professional

Dear [INSERT SCHOOL OR EDUCATOR NAME],

[INSERT STUDENT NAME] was evaluated on [INSERT DATE] for a concussion. The findings of the clinical evaluation indicate that [INSERT STUDENT NAME] has/does not have a concussion. The student has been (check one):

- Cleared for participation and return to learn
- Not cleared for participation
- Not cleared for return to learn

Specific guidelines for the patient are as follows:

______________________________________________________________________________________________________________

______________________________________________________________________________________________________________

______________________________________________________________________________________________________________

[Healthcare Provider] [Date]

Note: This example form, or similar, is for use by a healthcare provider at the conclusion of the evaluation.

Sources: Master, Gioia, Leddy & Grady (2012); Meehan & O’Brien (2018)
Figure 4.
Form letter for school recommendations for concussion management

<table>
<thead>
<tr>
<th>Patient Name: ____________________________</th>
<th>Date of Birth: ____________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Evaluation: ______________________</td>
<td>Referred by: ______________________________</td>
</tr>
<tr>
<td>Duration of Recommendations: 1 week 2 weeks 3 weeks 4 weeks</td>
<td></td>
</tr>
</tbody>
</table>

The patient will be reassessed for revision of these recommendations in ______ weeks.

This patient has been diagnosed with a concussion (a brain injury) and is currently under our care. Please excuse the patient from school today due to the medical appointment. Flexibility and additional supports are needed during recovery. The following are suggestions for academic adjustments to be individualized for the student as deemed appropriate in the school setting. Feel free to apply/remove adjustments as needed as the student's symptoms improve/worsen.

Symptom Checklist:
- Headache
- Visual problems
- Nausea
- Balance problems
- Dizziness
- Sensitivity to light
- Sensitivity to noise
- Memory issues
- Feeling foggy
- Fatigue
- Difficulty concentrating
- Irritability
- Visual problems
- Balance problems
- Dizziness
- Sensitivity to light
- Sensitivity to noise
- Memory issues
- Feeling foggy
- Fatigue
- Difficulty concentrating
- Irritability
- Visual problems
- Balance problems
- Dizziness
- Sensitivity to light
- Sensitivity to noise
- Memory issues
- Feeling foggy
- Fatigue
- Difficulty concentrating
- Irritability

Student is reporting difficulty with:
- All subjects
- Reading/language arts
- Science
- Music
- Focusing
- Listening
- Foreign language
- Math
- History
- Using computers
- Other:

Attendance
- No school for ___ school day(s)
- Attendance at school
- Full school days as tolerated by the student
- Partial days as tolerated by the student

Visual Stimulus
- Allow the student to wear sunglasses/hat in school as needed
- Provide pre-printed notes for class material and/or a note taker
- Limit computer and TV use, along with exposure to bright screens
- Reduce brightness on monitors/screens
- Change classroom seating as necessary
- Lunch in a quiet place with a friend
- Avoid music or shop classes
- Allow to wear earplugs as needed
- Allow class transitions before bell

Workload/Multi-Tasking
- Reduce overall amount of make-up work, classwork and homework
- Prorate workload when possible
- Reduce amount of homework given each day/night
- Allow for a scribe, oral response, and oral delivery of questions, if available
- Additional time to complete tests
- No more than one test a day
- No standardized testing until ______

Physical Exertion
- No physical exertion, activity, athletics, PE, recess
- Walking in PE class only
- Begin return-to-play protocol as outlined in the return-to-activity policy at school or as directed by the school athletic trainer
- I, ____________________________, give permission for ___________________ (healthcare provider) to share the aforementioned information with my child's school, as well as for communication to occur between the school and ___________________ (healthcare provider) for changes to this plan.

Additional Comments and/or Recommendations:

I, ____________________________, give permission for ___________________ (healthcare provider) to share the aforementioned information with my child's school, as well as for communication to occur between the school and ___________________ (healthcare provider) for changes to this plan.

Parent/Guardian Signature

Healthcare Provider Signature

Date

Note: The combination of the evaluation form and letter provides a clear depiction of the student’s restrictions for return to learning and activity.

Source: CDC (2015)
letic trainer, nurse practitioner, physician’s assistant, neuropsychologist) has provided medical clearance.

**Return-to-Learn Policies**

It is important to understand and reiterate that each state and school division may have different requirements. Kolodziej and Ploeg (2016) outlined each state’s laws and minimum requirements for concussion protocols in the athletic environment based on the National Conference of State Legislatures in 2014. According to the National Conference of State Legislatures (2017), few states reference, require or educate on return-to-learn policies. Specifically, only Hawaii and Idaho reference, and Indiana and West Virginia encourage, return-to-learn protocols. Nine states (NE, OK, IL, VA, NY, VT, MA, ME, MD) require return-to-learn protocols, but only Illinois requires the policy or protocol to be evidence-based. Additionally, New York, Maryland, and the District of Columbia require return-to-learn education for school personnel (National Conference of State Legislatures, 2017). According to Kolodziej and Ploeg, six states or fewer require: (1) notification of parents/guardians of injury, (2) evaluation by a physician, (3) written clearance from a physician prior to return, or (4) completion of a return-to-play progression before returning. It is recommended that physical educators use the guidelines provided by Kologziej and Ploeg as an educational reference.

Undergraduate health and physical education programs likely provide a basic overview of concussion education and management within the physical education classroom; however, these programs may not have the ability to go into depth regarding methods to adapt the classroom for a student who sustained a concussion. Graduates of these programs are encouraged to investigate the state legislature and specific school policies and protocols when hired due to significant variation in requirements among states. Free educational opportunities are available for educators to learn about concussions, as well as many of the current state policies. The National Federation of State High School Associations (2018) provides a free educational training that reviews vital information regarding concussions and where to locate more information relevant to one’s community and various student age groups.

Return to learn is a multi-step approach that utilizes a team to return students to full academic and physical expectations following a concussion (Halstead et al., 2013). The CDC’s HEADS UP to Schools program (2015) proposes that the team consist of members at the school and within the community that will support the student. The proposed list includes the student, their parent(s)/guardian(s), a physician, the school nurse, educators, coaches, the school psychologist and/or counselor, a member of the school’s administrative team, and/or care providers who work with the student (CDC, 2015).

Careful monitoring, tracking and evaluation of the student’s progress are needed to adequately prepare the student for a return to full academic rigor. A standardized policy is recommended using the processes outlined in Figure 6 that allows many opportunities to track the student’s progress toward returning to academics. All data should be collected and evaluated by the team leader and then managed by the school nurse or the healthcare provider identified in the state, district or school policy. The team leader should be a vested and highly involved member of the student’s care team (excluding the student) from the list referenced in the CDC’s HEADS UP program. The ultimate decision for a student to return to learn should rest in the hands of the student and family following clearance by an authorized medical professional.

Physical educators have various roles in monitoring and managing students after a concussion. The AAP places physical educators
on the return-to-learn team with the primary goal of protecting students from further potential brain injury (Halstead et al., 2013), since physical activity can exacerbate symptoms and prolong healing time. It is therefore important for physical educators to protect the students by removing them from participation until further evaluation by a healthcare professional and clearance for return to learn and play.

**Participation in the Classroom**

After a concussion has occurred physical and cognitive demands have the potential to cause stress on the brain during the healing process. The healing process is different for each student, concussion and situation. Headaches, difficulty processing, blurry vision, sensitivity to light and noise, and fatigue are likely to have the largest effect on learning and on classroom performance (CDC, 2019).
2015; Valovich McLeod et al., 2017). Fairly mundane tasks such as note taking and engaging in class conversation can exacerbate symptoms as well (Sady, Vaughan, & Gioia, 2011). Physical activity can result in additional stress on the brain; therefore, physical activity should not occur unless cleared by a healthcare provider. For classes that require physical activity, the standard of practice for the healthcare provider is to follow the evidence-based recommendations for concussion management outlined in the 5th International Conference on Concussion in Sport (McCrory et al., 2017). The physical educator may be tasked with assisting in the return-to-play progression but should not make progression decisions without consulting with the managing healthcare provider. While parents or guardians are likely to be involved in this process due to HIPAA and FERPA regulations, medical advice from the managing healthcare provider should be followed.

A student’s return-to-learn plan needs to be flexible and to allow for balance in academic requirements and cognitive ability. Often accommodations are needed, and the student should be an active participant in the development of the plan. Examples include but are not limited to allowing some flexibility in attendance of academic courses (i.e., morning, afternoon, additional breaks, alternative schedules of multiple classes) and the ability to rest for recovery (i.e., identify and/or provide quiet areas). Educators need to be supportive in the process by allowing students to come to class when they are able to perform, work with the student as they recover, and assist students in the completion of missed coursework until the student is reintroduced to full academic responsibilities.

Raising Awareness for the Management of Concussions

Several educational resources are available for physical educators to learn more about concussions in the secondary school setting (CDC, 2015, 2017a, 2017b; Halstead & Walter, 2010; Halstead et al., 2013; Kolodziej & Ploeg, 2016; McCrory et al., 2017; Sady et al., 2011). A valuable resource that may be available is the school athletic trainer. An athletic trainer (AT) is a healthcare professional that specializes in injury prevention, evaluation and management (NATA, n.d.). Depending on the state, ATs may be required to possess state licensure and/or certification by the Board of Certification. Athletic trainers are educated and trained in the evaluation and management of concussions. Concussion education and management resources may also be obtained from the AT to help create an educated and aware environment. Athletic trainers follow specific recommendations provided by the individual state legislative agencies, the NATA (n.d.), the AAP (2017), and the Zurich Consensus Statements (McCrory et al., 2017). Collaborating with and using the AT as a resource can be valuable in the student’s return-to-learn process related to academics.

Creating a community of support for the student is of utmost importance when an injury occurs. Due to the nature of the primary and secondary school setting, many people will be a part of the student’s daily routine, while few will spend a significant amount of time with the student. Therefore, providing awareness and education regarding concussions for the various individuals in the primary and secondary school setting is important. Fostering relationships between the educators, school nurse, school psychologist, AT, and additional stakeholders creates the opportunity to have a multi-member team approach to managing each student’s case. Using this collaborative approach regarding policy, resources and management of concussions creates a common ground for all parties to work from and to remain abreast of the proper steps needed to provide quality care in the learning environment. Furthermore, it is essential to have a concussion care team (as illustrated in Figure 7) composed of professionals with a variety of areas of expertise, all of whom at some point may be involved in the process from diagnosis to clearance and return to the classroom and other activities.
Parents and guardians also need to be included in the awareness and preparation of how to address a concussion. The CDC has published informational handouts and has a website explaining concussions with available resources for parents to use in the management of a child’s concussion symptoms and recovery (CDC, 2015). Concussion education is essential in building a community with resources to adapt, guide and facilitate the return of the student to the classroom. Sharing these types of resources with parents will ultimately promote the importance of concussion education and raise awareness as it relates to potential signs and symptoms that may begin to show once a student leaves school. Members of the concussion care team should also follow up with parents and guardians to ensure they are also receiving the support needed while helping their child return to normal activities.

**Conclusion**

Education programs at the undergraduate and graduate levels are built on standards at both the national (SHAPE America, 2017) and state level in order to prepare successful, well-equipped educators. However, very few, if any, curricula allow for further exploration of various conditions such as a concussion and the effect it has on physical education at a deeper level. This article aimed to highlight areas of importance related to concussion awareness, management, and inclusion of key stakeholders (i.e., physical educator, athletic trainer, nurse, school psychologist, school administration, physician) to facilitate the student’s transition back into the classroom. Literature is available to provide educators with knowledge of concussions and general practices related to return to learning and activity (CDC, 2015, 2017a, 2017b; Field et al., 2003; Halstead & Walter, 2010; Halstead et al., 2013; Kolodziej & Ploeg, 2016; McCrory et al., 2017; Sady et al., 2011); however, further guidance is needed for educators to be informed on the process of referring the student when a concussion is suspected, monitoring the student’s progress in the classroom, and adapting educational activities based on the student’s current needs.

Further education and training are also needed on a consistent and regular basis for all educators, specifically for physical educators at the elementary, middle and high school levels who may not be coaches. For example, resources and trainings that focus on the differences in cognitive development among students of various ages may help educators adapt activities for those suffering from a current or recent concussion. Also, establishing and using a chain of command in each school, specific to the school’s resources and personnel, will help educators in navigating and managing their classrooms to include students who are currently suffering, or who have recently suffered, from a concussion. Exercising the importance of concussion education, pursuing additional resources and trainings to help modify the classroom for students with concussions, and creating a supportive community will benefit physical educators and, more importantly, the students.

**References**

