

Concussion Management Guidelines

for Iowa Schools



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1. Purpose

On April 7, 2011, Iowa enacted legislation (*Code of Iowa 280.13C*) for the protection of students from concussion and other brain injuries. This legislation requires three main brain injury policy activities:

- 1) Education on concussion, brain injury identification, and associated risk of participating in extracurricular activities after suffering a concussion or brain injury;
- 2) Removal from play for suspected concussion; and
- 3) Return-to-play after evaluation and written clearance from a health care provider.

Because this law applies to students participating in sports, dance, or cheerleading in seventh through 12th grades, much of the initial focus for concussion education and management has been on high school student athletes and their return-to-play. As concussion awareness has increased, so has the apparent need for consistent and reliable information about the proper management of concussion for students of all ages, regardless of the cause of their concussion. In response, a community-based concussion management program authored by Dr. Karen McAvoy, called *REAP* (which stands for Remove/Reduce, Educate, Adjust/Accommodate, and Pace), was adapted in 2016 by the Brain Injury Alliance of Iowa.

The Iowa Departments of Education and Public Health have both endorsed the utilization of *REAP*. *Concussion Management Guidelines for Iowa Schools* builds upon the elements outlined in the *REAP* manual. These guidelines include information and resources Iowa schools can utilize when forming their multi-disciplinary concussion management teams and implementing concussion management protocols.

A group of experts from across Iowa developed the content in this document. Information was utilized from publicly available material through the Centers for Disease Control and Prevention (CDC); Rocky Mountain Hospital for Children – HealthONE; Colorado Department of Education; and the 5th International Conference on Concussion in Sport held in Berlin, October 2016. A list of these and other references are available at the end of this document.

This information is intended for all Iowa public and non-public accredited schools supporting learners from pre-K through age 21. The implementation of *Concussion Management Guidelines for Iowa Schools* is voluntary and may be used at the discretion of individual schools; however, the Iowa Departments of Education and Public Health strongly encourage the use of these guidelines to protect the health and safety of students who sustain a concussion.

The *Concussion Management Guidelines for Iowa Schools* will be reviewed, at a minimum, every three years to ensure the content reflects current knowledge and best practices in the field of youth concussion. Therefore, schools and individuals using this information should verify they have the most current version of this guide. For further information, including technical assistance for implementing these guidelines, contact the Iowa Department of Public Health by calling 515-281-8465 or emailing brain.injury@idph.iowa.gov.

2. Introduction

What is a concussion?

Concussions are a type of traumatic brain injury caused by a fall, motor vehicle crash, or other bump or blow to the head or body. Sometimes an injury resulting in concussion is referred to as a “ding” or “getting your bell rung,” but what seems to be a mild bump or blow can be very serious. The student may experience a loss of consciousness; however, most concussions occur **without** a loss of consciousness. A concussion can impair not only the physical abilities of a student, it can also affect how that student thinks, acts, feels, and learns.

Signs and symptoms

Signs and symptoms of concussion can occur immediately after the injury or may not become apparent until days after the injury. Children and adolescents are more susceptible to concussions and take longer to recover from their symptoms than adults; however, most children and adolescents will recover quickly and fully. The typical length of recovery may vary, with some students’ concussion symptoms lasting for only a few days while others continue to have symptoms for several weeks or even months. Consequently, symptoms may have short- or long-term effects on the student.

How a concussion affects a student will vary on a case-by-case basis. Signs and symptoms generally fall into one of four categories: physical, cognitive, emotional, or sleep/energy. Examples of signs and symptoms that may be experienced after a concussion are outlined in Table 1.

Table 1: Concussion signs and symptoms

<p style="text-align: center;">PHYSICAL (how a person feels physically)</p> <p>Headache/pressure Blurred vision Dizziness Ringing in ears Seeing “stars” Vacant stare/Glassy eyed</p> <p>Nausea Vomiting Numbness/Tingling Sensitivity to light Sensitivity to noise Disorientation Neck pain</p>	<p style="text-align: center;">COGNITIVE (how a person thinks)</p> <p>Feel in a “fog” Feel “slowed down” Difficulty remembering Difficulty concentrating Difficulty organizing</p> <p>Easily confused Easily distracted Slowed speech</p>
<p style="text-align: center;">EMOTIONAL (how a person feels emotionally)</p> <p>Inappropriate emotions Personality change Nervousness/Anxiety Feeling more “emotional”</p> <p>Irritability Sadness Lack of motivation Argumentative Easily annoyed</p>	<p style="text-align: center;">SLEEP/ENERGY (how a person experiences their energy level and/or sleep patterns)</p> <p>Fatigue Excess sleep Trouble falling asleep</p> <p>Drowsiness Sleeping less than usual</p>

Prevention

A concussion is a type of traumatic brain injury. Children and adolescents are especially at risk of sustaining a concussion when they are active participants in sports and other physical activities. Therefore, it is important to reduce the risk of concussion from happening by taking preventive measures. These steps include:

- Maintaining a safe school environment through periodic safety reviews of play/sporting areas to ensure that equipment and surfaces are appropriate, safe, and maintained.
- Providing appropriate and adequate supervision for sporting events, field trips, and recess.
- Providing access to properly fitted protective gear designed for the activity.
- Implementing and enforcing guidelines for fair rules and appropriate techniques.

Creating a culture of good concussion management

Recognition and the proper response to concussions help to promote recovery and reduce the risk of further injury, or even death. Iowa's concussion law mandates specific brain injury policies for the education of coaches, parents, and athletes about concussion recognition, signs, and symptoms. After a suspected concussion, the law requires the removal of the student athlete from play/activity. Once removed, the student athlete can only return to play/activity with written clearance from a health care professional. In order to create a protocol that is more comprehensive, schools are encouraged to expand on the minimum standards included in the law by utilizing the best practice guidelines highlighted in this document.

- For more information about *Code of Iowa 280.13C* and recommended best practices, see section 5: Return to Activity/Play.

A school with a positive concussion culture is one where youth recognize and report concussion symptoms so that they can get the support and time needed to recover. This approach includes providing concussion information, as well as shaping the way concussion is discussed. Coaches, school staff, and parents should routinely speak to the students, particularly student athletes, about concussions and the importance of maintaining health and safety. An environment should be created where students are encouraged to discuss their concerns and questions about concussion. Students should feel supported in reporting a concussion and removing themselves from play. Schools should also convey their commitment to support students returning to learn in the classroom after sustaining a concussion through established protocols and practices.

Establishing a team-based concussion management protocol

Schools are recommended to have a written concussion management protocol that includes strategies to educate teachers, staff, students, and parents regarding concussion prevention, identification, and management. The protocol should outline the school's plan to support students returning to learn through appropriate academic adjustments or accommodations, as well as a graduated return to activity once the student's concussion symptoms have sufficiently resolved in the academic setting.

A key component to successfully supporting a student with concussion symptoms involves the utilization of a “Concussion Management Team.” This multi-disciplinary team consists of four sub-groups: the Family Team, School Academic Team, School Physical Team, and Medical Team. These four teams each have specific roles and responsibilities during the return-to-learn and return-to-play process and will be referred to throughout this document.

- See section 8: Developing a Concussion Management Protocol for more detail about implementing the concussion management team.

The concussion management team

A multi-disciplinary concussion management team approach is an optimal way to manage a concussion and to return a student to learning and physical activity. This approach involves communication and collaboration among the team members throughout the stages of concussion recovery. The degree of involvement from specific team members may fluctuate throughout this process, depending on the stage of recovery and the needs of the student.

As stated earlier, the Concussion Management Team consists of four smaller teams, (1) Family Team; (2) School Academic Team; (3) School Physical Team; and (4) Medical Team. Each team has an important role in the various stages of concussion recovery, as outlined in the REAP manual:

- The School Physical Team and/or Family Team may be the first to recognize a suspected concussion and to remove the student from activity.
- The Medical Team has a role in diagnosing, managing the concussion, and ruling out a more serious medical condition.
- During the early stages of concussion recovery, the Family Team and School Academic Team will provide critical management by reducing social, home, and school stimulation in collaboration with the Medical Team. These teams will lead symptom tracking and monitoring.
- When all four teams decide that the student has recovered to a pre-concussion level of functioning, the Medical Team can approve a graduated “return-to-play” protocol to be implemented by the School Physical Team. At this stage, the School Physical Team will have a lead role in symptom tracking and monitoring.
- It is important that the entire team continue to have communication regarding the student’s progress, and to report any return of symptoms with increases in activity.
- When the student successfully completes the “return-to-play” steps, the Medical Team can determine final clearance. If a student did not access a health care provider, the parent/guardian may give written permission to return to activity/play.

Table 2: Multi-disciplinary concussion management team

Team	Roles & Responsibilities	Team Members
Family Team	<ul style="list-style-type: none"> • Remove student from physical activity immediately, including play at 	<ul style="list-style-type: none"> • The student • Parents/guardians

	<p>home/community, recreational and/or club sports.</p> <ul style="list-style-type: none"> • Communicate with school and medical teams. • Reduce home/social stimulation including “screen time” such as texting, social media, video games, and TV. This also includes reducing or eliminating time spent in loud environments such as sporting events, parties, concerts and dances. • Reduce or restrict driving or operating machinery. • Encourage rest. • Monitor and document emotional and sleep/energy changes attributed to the concussion by using a symptom checklist. • Provide information regarding student’s pre-concussion cognitive functioning to the Medical and School Teams. • As symptoms lessen, gradually remove home and activity restrictions, as tolerated. 	<ul style="list-style-type: none"> • Other family members
Medical Team	<ul style="list-style-type: none"> • Remove student from physical activity immediately. • Rule out more severe medical issues, including a severe traumatic brain injury. Consider risk factors and evaluate for concussion complications. • Support reduction of school demands and home/social stimulation. • Encourage rest. • Approve graduated return-to-play after determining student’s concussion symptoms have resolved and when documentation indicates the student is performing at pre-concussion cognitive demand levels at home and school. 	<p>Student-specific, licensed healthcare provider. May include:</p> <ul style="list-style-type: none"> • Physician • Physician assistant • Chiropractor • Advanced nurse practitioner • Registered Nurse • Physical therapist • Athletic trainer • Neuropsychologist
School Academic Team	<ul style="list-style-type: none"> • Remove student from all physical activity at school, including PE and recess. • Adjust academic demands (see section 3: Implications for Learning – Acute Recovery). • Encourage “brain rest” breaks at school. • Monitor and document academic and emotional effects of the concussion. • Provide information regarding student’s pre-concussion academic functioning. • Assign an academic “point person.” 	<p>May include:</p> <ul style="list-style-type: none"> • Administrator • 504 coordinator • School social worker • Counselor • School psychologist • Teacher • Classroom paraprofessional

	<ul style="list-style-type: none"> Teachers can gradually increase cognitive demands or reduce academic adjustments, as tolerated, using the decision-making flow chart in Figure 1. 	<ul style="list-style-type: none"> AEA Brain Injury Resource Team consultant
School Physical Team	<ul style="list-style-type: none"> Remove student from all physical activity immediately. Support reduction of school demands and home/school stimulation. Provide encouragement to rest and take the needed time to heal. Watch, monitor and track physical symptoms of the concussion. Appoint a physical team “point person.” Monitor the graduated return-to-play steps after receiving medical approval. 	<p>May include:</p> <ul style="list-style-type: none"> Registered nurse Licensed athletic trainer Coach Physical education teacher Athletic director

3. Implications for Learning – Acute Recovery

Returning to school after a concussion

It is common for the student, their parents/guardians, or their coaches to wonder when the student is ready to be cleared to return to sports and other physical activities. However, it is important to remember that each youth is a student first and an athlete second. This means that planning for the student to “return-to-learn” is as important as their “return-to-play.”

Following a concussion, it can be difficult for a health care provider to anticipate when the student will be ready to return to school. It is not necessary for the student to be 100 percent symptom free before returning to school; many students who have experienced a concussion can return to the classroom while still experiencing some symptoms related to their injury. A good rule of thumb is to wait until the student is beginning to tolerate 30-45 minutes of light cognitive activity. Typically, this should not require more than two or three days of absence from school, although each case should be managed individually. The goal is to return the student to the classroom as soon as possible without causing symptoms to worsen. Table 3 outlines a structured return-to-school strategy and the goal of each stage.

Concussions are as unique as the individuals who experience them. This uniqueness includes the severity and combination of symptoms experienced as well as the rate at which the student will recover. Open communication between the parent/guardian, student, health care provider, and school staff will be important for determining how soon the student returns to school and the extent of academic adjustments required to ensure optimal recovery. To accurately evaluate the rate of recovery, it is important for post-concussive symptoms to be monitored carefully. A symptom checklist, such as the one found in Appendix B, should be used to monitor symptom status and recovery.

- Additional information on symptom monitoring, including a recommended frequency of monitoring, can be found in section 6: Partnering with Families.

Table 3: Graduated return-to-school strategy (McCrary et al, 2017)

Stage	Goal	Activity	Objective of each stage
1	Daily activities at home that do not give the child symptoms	Typical activities of the child during the day as long as activities do not increase symptoms (e.g., reading, texting, screen time). Start with 5-15 minutes at a time and gradually build up.	Gradual return to typical activities
2	School activities	Homework, reading or other cognitive activities outside of the classroom.	Increase tolerance to cognitive work
3	Return to school part-time	Gradual introduction of schoolwork. May need to start with a partial school day or with increased breaks during the day.	Increase academic activities
4	Return to school full-time	Gradually progress to increased school activities until a full day can be tolerated.	Return to full academic activities and catch up on missed work as needed

Once a concussion has been diagnosed, it is critical to REMOVE the student from physical activity, including PE/gym classes, active recess, and athletics until the student has been cleared by their health care provider.

- For additional information about how and when to reintroduce physical activity, refer to the section 5: Return to Activity & Play.

A review by the concussion management team should be conducted promptly to determine the need for supports, if any. Given the majority of students with a concussion will have their symptoms resolve within two to three weeks, it may be most efficient to implement many of the needed classroom adjustments before a formal accommodation plan can be put fully in place. However, the concussion management team may consider starting conversations about formalizing a plan for the student so that a seamless transition can occur if additional supports are needed later on.

Regardless of whether or not supports are formalized, the concussion management team will be responsible for assuring that everyone supporting the student understands the situation and their role concerning the safety and well-being of the student. This includes clearly communicating the following information:

- The student's condition.
- Implications the symptoms have on learning.
- Individualized adjustments and accommodations implemented.
- Information/data collection and reporting.
- The roles and responsibilities of the various team members.

- More information about setting up the concussion management team and coordinating the flow of information is available in section 8: Developing a Concussion Management Protocol.

Adjustment versus accommodation

The terms “adjustment” and “accommodation” are used throughout this document to describe the various interventions that may be implemented to support the student while they recover from a concussion. Adjustment is used to describe the informal changes implemented to support the student. Accommodation describes changes documented in a formalized process such as a Section 504 Plan or Individualized Education Plan (IEP).

- For more information on Section 504 of the Rehabilitation Act, see section 7: Providing Collaborative Care after Concussion.

Classroom adjustments

Academic adjustments support the student by pacing cognitive demands while recovering from the concussion. It is up to the school and its teachers, with input from the family and student, to determine which adjustments to put in place to best support the student’s individualized needs during this acute recovery stage. The school academic and physical teams will coordinate the return of the student; therefore, it is important that all adults involved understand the student’s symptoms and how best to pace cognitive demands.

In Table 4, the “symptom wheel” provides strategies that correspond with specific concerns the student may experience after a concussion. Although a health care provider may make recommendations regarding concussion management, a medical order or release is not required to initiate or modify academic adjustments or accommodations.

To support the student’s concussion recovery process, the majority of adjustments should be made immediately following the injury and then, as the student’s symptoms begin to resolve, adjustments can be scaled back simultaneously as cognitive demands are increased. This approach provides the appropriate amount of cognitive rest while supporting the student’s academic engagement.

It is acceptable to have the student return to the classroom while they continue to experience symptoms as long as the symptoms are tolerable, manageable, and/or intermittent. Adjustments should be implemented in the general education classroom as soon as possible and be based on the specific symptoms the student is experiencing. However, educators should recognize that it is not unusual for students to be reluctant to accept adjustments and to try to “push through” symptoms to complete their assignments. Additionally, younger students may have a more difficult time explaining their symptoms and identifying their academic needs.

Table 4: Symptom wheel

<p>PHYSICAL:</p> <ul style="list-style-type: none"> • Strategic Rest Scheduled 15 to 20 minute breaks in clinic/quiet space (mid-morning; mid-afternoon and/or as needed). • Sunglasses (inside and outside). • Quiet room/environment, quiet lunch, quiet recess. • More frequent breaks in classroom and/or in clinic. • Allow quiet passing in halls. • REMOVE from PE, physical recess and dance classes without penalty. • Sit out of music, band and computer classes if symptoms are provoked. 	<p>Symptom Wheel Suggested Academic Adjustments <i>(McAvoy, 2013)</i></p> <p>PHYSICAL Headache/sick to stomach Dizziness/balance problems Light sensitivity/blurred vision Noise sensitivity</p> <p>COGNITIVE trouble with: concentration remembering mentally "foggy" slowed processing</p> <p>EMOTIONAL feeling more: emotional nervous sad angry irritable</p> <p>SLEEP/ENERGY mentally fatigued drowsy sleeping too much sleeping too little can't initiate/maintain sleep</p>	<p>COGNITIVE:</p> <ul style="list-style-type: none"> • REDUCE workload in the classroom/homework. • REMOVE non-essential work. • REDUCE repetition of work (e.g., only do even problems; go for quality, not quantity). • Adjust "due" dates; allow for extra time. • Allow students to "audit" classwork. • Exempt/postpone large test/projects; alternative testing (quiet testing, one-on-one testing, oral testing). • Allow demonstration of learning in alternative fashion. • Provide written instructions. • Allow for "buddy notes" or teacher notes, study guides, word banks. • Allow for technology (tape recorder, smart pen) if tolerated.
<p>EMOTIONAL:</p> <ul style="list-style-type: none"> • Allow student to have "signal" to leave room. • Help staff understand that mental fatigue can manifest in "emotional meltdown." • Allow student to remove him/herself to de-escalate. • Allow student to visit with supportive adult (counselor, nurse, advisor). • Watch for secondary symptoms of depression and anxiety usually due to social isolation and concern over "make up work" and slipping grades. These extra emotional factors can delay recovery. 	<p>SLEEP/ENERGY:</p> <ul style="list-style-type: none"> • Allow for rest breaks-in classroom or clinic (i.e. "brain rest breaks" = head on desk, eyes closed for 5 to 10 minutes). • Allow student to start school later in the day. • Allow student to leave school early. • Alternate "mental challenge" with "mental rest." 	

The student with a concussed brain may not be as efficient in their ability to learn new material; therefore, cognitive rest is important and applies to both the activities within the classroom as

well as homework assignments and exams. Not only can it be difficult for the student to convert the information from working memory into long-term memory, but conceptual learning can be affected as well. Simply postponing assignments, projects, and exams for later completion is not recommended. This may create a stockpile of work that exceeds the capacity of the student's recovering brain and can create a great amount of anxiety for the student.

The ultimate goal for academic adjustments is that the student will still be able to demonstrate mastery of learning standards and benchmarks. One method for helping teachers implement adjustments is to categorize each of the pieces of a lesson plan in one of three ways: (1) excused work, (2) accountable or negotiable work, or (3) required work. If adjustments that modify standards and benchmarks are needed, a "Disability Suspected" meeting should be considered.

"Excused work" includes the in-class and homework assignments or projects that are **not** required and **do not** need to be made up later. "Accountable/negotiable work" includes content that is required, but for which the process can be modified (e.g., alternate assignments). Finally, "required work" includes assignments and exams that **must** be completed by the student and will be graded.

The following recommendations should be considered when the student is struggling to learn new information or is not able to fully participate in class:

- Determine which material is the most critical for the student to receive and to be held responsible. Because the learning process is compromised after a concussion, the teacher must choose which parts of the lesson plan are the most important.
- Remove or excuse the student from tests or large projects. Testing while the student is cognitively compromised may not accurately reflect the student's skills. This is especially applicable for high stakes tests and projects.
- Standardized tests should be avoided or appropriate testing adjustments should be provided.
- Focus on ensuring the student understands the material rather than requiring rote memorization of facts.
- Remove in-class work and homework that is not essential. It is not practical to expect the student to make up all the work that was missed or delayed while recovering from a concussion.

On average, 80 to 90 percent of students with concussions will recover within two to three weeks. During this time, the student may be able to exert increasing amounts of cognitive energy each day while symptoms simultaneously become less frequent and severe. Therefore, academic adjustments should be fluid and flexible based on the progress of the student's recovery.

Using symptoms to monitor recovery

During concussion recovery, the goal is to have the student participate in learning without exacerbating concussion symptoms. Implementing frequent, objective assessments of the student's concussion symptoms is the only way to evaluate the balance between sufficient academic adjustments and cognitive demands.

As the student improves, tolerance of cognitive demands may be tested by increasing work amount, difficulty, or time required (only one component should be changed at a time). As outlined in Figure 1, teachers can base their decision for increasing workload by using symptom feedback as a guide. If the student does not report a recurrence or increase in concussion related symptoms when increased demands are implemented, continue to gradually introduce additional cognitive demands over time. However, if symptoms worsen discontinue the activity for at least 20 minutes while the student is allowed to rest. If rest provides symptom relief, then the student can attempt the activity again either at the same or lower demand level that caused the symptoms. If rest does not relieve the symptoms, the activity should be discontinued and reattempted later. The health care provider should be updated regarding the student's progress during this process, especially in the event the student is not progressing through the steps for increasing cognitive demands.

The same method can also be used for gradually increasing home, social, and school activities. As the student begins to experience a decrease in symptoms, their ability to tolerate additional activities can be tested, with the exception of physical activities. If the activity makes symptoms worse, stop the activity and try again after the symptoms improve with rest.

A valuable tool for monitoring symptoms is a symptom checklist or rating scale. Monitoring symptoms provides information used to assess symptoms and to track the student's symptom severity and recovery across settings. The symptom checklist or rating scale should be simple enough to be used by the student, the family, the school, and the health care provider. While it is important to monitor symptoms at school, the family and student should be monitoring symptoms at home as well. The full range of symptoms the student has experienced post-injury should be monitored, including changes in sleep, energy, and emotions. The health care provider can help to determine which symptoms developed post-injury as a result of the concussion.

- A sample symptom checklist is available in Appendix B.

Communication is vital to ensure optimal recovery from a concussion. Not only is communication between the family and school critical, but communication is essential among all members of the concussion management team. This includes sharing updates about the student's symptoms as well as any stressors the student is experiencing. Ideally, the monitoring of symptoms should take place at both school and home. Then, the information collected is shared across settings and among team members.

- A sample teacher feedback form is available in Appendix C.

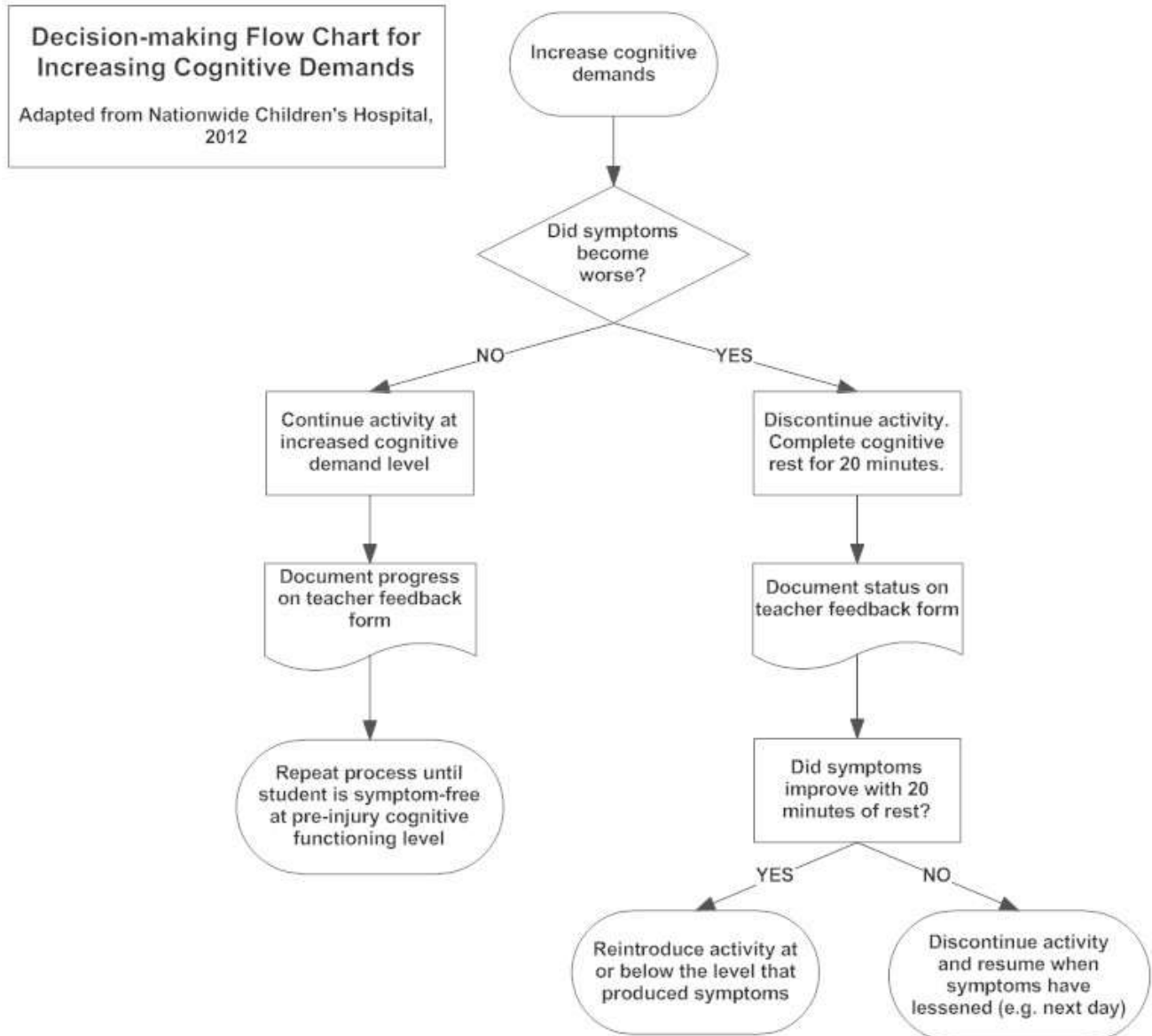


Figure 1: Decision-making flow chart for increasing cognitive demands

Just as the process for increasing cognitive demands must be individualized based on the needs of each student, the frequency of symptom tracking, as well as the type of symptoms that are monitored, should be determined by the concussion management team. During the first week of recovery, symptoms may need to be assessed daily, especially to monitor sleep/energy and emotional symptoms. Frequency of monitoring can be tapered during the subsequent weeks of recovery, assessing symptoms at least three times a week during the second week of recovery and at least twice during the third week.

The information gathered should be used to monitor progress and modify adjustments during the student's recovery. Information about the student's progress at school and home is also

useful for the health care provider when determining recommendations regarding the graduated return-to-play/activity process. When feasible, a release of information form should be signed by the student's parent/guardian to allow direct information sharing between the school and a health care provider. The school team should identify a person, ideally the school nurse, to facilitate the communication between the school and the health care provider.

- Additional information about setting up these processes can be found in section 7: Providing Collaborative Care after a Concussion.

4. Implications for Learning – Prolonged Recovery

The majority of students (80 to 90 percent) will have concussion symptoms resolve within two to three weeks. However, the remaining 10 to 20 percent of students will have ongoing symptoms that take longer to resolve. For those students who continue to struggle past the acute recovery phase (four or more weeks), the concussion management team will need to discuss options for supporting the student through more extensive, or targeted, academic accommodations. A hierarchy support process may begin with the multi-tiered system of supports (MTSS). Should a need persist for three months or more, a Section 504 evaluation may be warranted.

In the event that the student's concussion impacts their learning for a longer period, or even permanently, more significant academic modifications may need to be considered and the student should be evaluated for an Individualized Education Plan (IEP).

- More information about Section 504 and IDEA can be found in section 7: Providing Collaborative Care after Concussion.

5. Return to Activity & Play

Reducing the risk of concussion

As mentioned earlier, children and adolescents are especially at risk of sustaining a concussion when participating in sports and other physical activities. It is important to reduce the incidence of concussion by taking preventive measures.

These measures include routinely conducting safety reviews of play/sporting areas to ensure that equipment and surfaces are safe and well-maintained. Similarly, students of all ages should have access to, and appropriate fitting of, activity-specific protective gear. Licensed athletic trainers, when available, are a knowledgeable resource to provide options, proper sizing, and fitting of protective gear. The CDC has downloadable helmet fact sheets for a variety of activities, which address proper size and fit as well as care and replacement tips.

- A link to CDC materials is included in the resource list found in Appendix A.

An adequate number of appropriately trained individuals should provide supervision for sporting events, field trips, and recess should be provided at all grade levels. Guidelines for age-

appropriate, fair rules, and safe techniques should be established, communicated, and enforced. The Iowa High School Athletic Association and the Iowa Girls’ Athletic Union have established protocols that can be referenced to establish guidelines for use with younger students.

- A link to the Iowa High School Athletic Association and Iowa Girls’ Athletic Union concussion page is included in the resource list found in Appendix A.

[Iowa Concussion Law and Recommended Best Practice](#)

Return-to-school does not automatically mean return-to-play. It is essential that the student has recovered sufficiently from the concussion, meaning the student is able to be free from concussion symptoms while managing pre-concussion level cognitive demands. For the purpose of these guidelines, “play” includes not just extracurricular interscholastic activities as defined by the *Code of Iowa 280.13C* but also includes physical activity the student may participate in such as, but not limited to, physical education, dance, sports leagues, and recess.

The 2011 Iowa law outlines specific policies regarding concussion education as well as the removal and return-to-play of students who have a suspected concussion. Students covered by the law are those individuals in grades 7 through 12 who are participating in an extracurricular interscholastic activity. As defined by the law, “extracurricular interscholastic activity” means “any extracurricular interscholastic activity, contest, or practice, including sports, dance, or cheerleading.”

In the following tables (5-7), the requirements of the law are outlined along with corresponding recommendations for best practice. These recommendations are not required by Iowa law, but should be considered for adoption by schools and applied to **all** students, not just high school level student-athletes.

Table 5: Iowa law and best practice recommendations - concussion education

CONCUSSION EDUCATION
Required by Iowa Code 280.13C(1)b
Annually, each school district and nonpublic school shall provide to the parent or guardian of each student a concussion and brain injury information sheet, as provided by the Iowa High School Athletic Association (IHSAA) and the Iowa Girls’ High School Athletic Union (IGHSAU). The student and the student’s parent or guardian shall sign and return the concussion and brain injury information sheet to the student’s school prior to the student’s participation in any extracurricular interscholastic activity for grades seven through twelve.
Best Practice Recommendations for Concussion Education
❖ Annual distribution of concussion and brain injury information fact sheet to all students and parents/guardians, regardless of the student’s grade or participation in extracurricular interscholastic activity. The IHSAA and IGHSAU currently distribute the CDC’s <i>HEADS UP</i> :

Concussion in High School Sports fact sheet for parents and students. This document is available in over 40 languages through your school's TransACT account.

- ❖ Annually, the student and their parent/guardian should sign and return the concussion and brain injury information sheet to the student's school, prior to participation in any school sponsored activity/sport **for all grades**.
- ❖ Annually, school staff should receive a concussion and brain injury information fact sheet and be informed of the school's protocol for concussion management.
- ❖ Annually, coaches at all levels complete the online concussion training available for free through NFHSlearn.com. This training is currently required by the Iowa Board of Educational Examiners for coaches of athletes in grades seven through twelve and recommended by IHSAA and IGHSAU for all coaches.
- ❖ Annually, school staff who teach physical education or supervise recess, along with the school nurse, should complete a concussion training, such as the one available for free through NFHSlearn.com.
- ❖ Health education or physical education coursework should incorporate age-appropriate information on the risk, signs, symptoms and behaviors consistent with a concussion or brain injury, including the dangers of continuing to participate in activities after sustaining a concussion or brain injury.
- ❖ Annually, school staff participating on the concussion management team should receive concussion and brain injury continuing education.

Table 6: Iowa law and best practice recommendations – removal from play and activity

REMOVAL FROM PLAY and ACTIVITY
Required by Iowa Code 280.13C(2)
<p>If a student's coach or contest official observes signs, symptoms, or behaviors consistent with a concussion or brain injury in an extracurricular interscholastic activity, the student shall be immediately removed from participation.</p>
Best Practice Recommendations for Removal from Play/Activity
<ul style="list-style-type: none"> ❖ If any school employees or contracted staff observes signs, symptoms, or behaviors consistent with concussion or brain injury during physical activity (e.g. recess, physical education, extracurricular activities/sports sponsored by the school at any grade level), the student should be immediately removed from participation. ❖ A responsible adult should remain with the student and continue to monitor for deterioration during the initial few hours after injury. The student should not be allowed to drive. ❖ The parent/guardian, teacher/s, school nurse, and school administrator should be notified as soon as possible regarding any student who has been removed from play/activity for a suspected concussion. ❖ A licensed health care provider should evaluate a student suspected of having a concussion the same day the injury occurs. ❖ If a student or parent/guardian report to the school an injury resulting in signs, symptoms, or behaviors consistent with concussion or brain injury, the student should be removed from participation in physical activities including but not limited to recess, P.E., and sports.

- ❖ Begin forming the student’s concussion management team to discuss possible academic adjustments and monitoring of symptoms.

Table 7: Iowa law and best practice recommendations – return-to-play and activity

RETURN-TO-PLAY (RTP) and ACTIVITY (RTA)
Required by Iowa Code 280.13C(3)a
A student who has been removed from participation shall not recommence such participation until the student has been evaluated by a licensed health care provider trained in the evaluation and management of concussions and other brain injuries and the student has received written clearance to return to participation from the health care provider.
Best Practice Recommendations for RTP/RTA
<ul style="list-style-type: none"> ❖ Any student who has been removed from participation due to suspected concussion should not be allowed to return to participation in physical activities (e.g., physical recess, physical education, sports, dance) until evaluated by a license health care provider trained in the evaluation and management of concussion and other brain injuries. ❖ Students should not return to activity the same day of the suspected concussion. ❖ Students who are exhibiting signs and symptoms consistent with a concussion following an injury should not be returned to activity/play until they are able to manage pre-injury cognitive demands without symptoms. ❖ The graduated RTP protocol may begin after the concussion management team has agreed that the student is symptom-free at pre-concussion cognitive levels. If a health care provider is involved as part of the concussion management team, written clearance has been provided to begin RTP. ❖ The RTP protocol should include provisions to delay return-to-play if any signs or symptoms of concussion return during or after physical activity. ❖ After a suspected concussion occurs, each school should have a process that activates the concussion management team to provide coordinated communication and timely documentation. The school must also have a process for documenting the injury, symptom tracking, and written clearance. ❖ Each school should implement a written concussion management plan applicable to all students. ❖ The concussion management team should be involved in the evaluation and communication of returning students to activity/play.

Concussion testing

The IHSAA and IHSGAU have recommended the use of the *Sport Concussion Assessment Tool 3 (SCAT3)* or *Sport Concussion Assessment Tool 5 (SCAT5)* as a tool for the sideline evaluation for possible concussion of injured athletes. Both are standardized tools for medical professionals to use with students aged 13 years and older. For younger children, ages 12 and under, the *Child SCAT3* and *Child SCAT5* are available. The *Concussion Recognition Tool 5* is a validated tool

for use by coaches and parents to aid in determining whether they should remove a student from an activity and further evaluation is needed.

- Links to the *SCAT*, *Child SCAT* and the *Concussion Recognition Tool* are included in the resources list found in Appendix A.

There are a number of commonly used, commercially available pre- and post-concussion tests of mental status, orientation, and postural-stability. These assessments are completed by individuals with the required credentials. Results of any testing or assessment should be shared with the health care provider and the concussion management team; however, no diagnosis of concussion or return-to-play decision should be made solely based on concussion cognitive testing. A student may still have a concussion even if they score in the normal range on a concussion assessment. Therefore, any test or assessment results should be treated as an additional report used to inform the concussion management team and healthcare provider.

Conducting a concussion history may identify students who fit a high-risk category. A structured history may include specific questions about previous symptoms of a concussion and the length of recovery. Questions assessing the symptom severity relative to severity of impact may also provide a health care provider with an indication of whether the student may have a progressively increased vulnerability to injury. This information may be useful in determining whether a student athlete should “retire” from participation.

Graduated return-to-play

Best practice for concussion management includes ensuring the student being symptom-free prior to the health care professional approving and monitoring a graduated return-to-play process (see Table 8). **If the student is receiving any concussion-related academic adjustments related to a concussion, they are not yet ready to return-to-play.**

Until recently, it had generally been accepted that following a concussion, complete rest was recommended until the individual was symptom-free. This belief was based on the idea that rest may reduce the symptoms during acute recovery and promote recovery by minimizing the cognitive and physical demands on the brain. Research now shows that light activity can help individuals recover more quickly and that prolonged rest may have adverse effects. The 2016 Berlin consensus statement includes the following recommendation:

“After a brief period of rest during the acute phase (24-48 hours) after injury, patients can be encouraged to become gradually and progressively more activity while staying below their cognitive and physical symptom-exacerbation threshold (i.e., activity level should not bring on or worsen their symptoms). It is reasonable for athletes to avoid vigorous exertion while they are recovering.” (McCroory et al, 2017)

The level of activity described above is considered stage one of the graduated return-to-play process. Returning to play and activity following a concussion is a medical decision that should include the following decision-making criteria:

- The student is symptom-free at home, interacting with friends and family normally, and documented symptoms should be at baseline or “0.”
- Academic adjustments are no longer required and the student is symptom-free at school and performing at their pre-concussion levels for schoolwork and during social activities. This includes the School Academic Team reporting the student’s test scores, workload, and homework are back to where they were before the concussion, and teacher observations include the student is no longer exhibiting signs of concussion and symptom-free when in loud, busy environments such as hallways, assemblies, and lunchroom.
- If applicable, the student’s neurocognitive testing scores are back to baseline.
- The licensed athletic trainer, if involved, reports that the student is 100 percent symptom-free.
- The student is no longer taking any concussion-related medications, including over-the-counter medications used to treat headache or pain related to the concussion.

If the student does not meet the above criteria, they are not ready to begin the graduated return-to-play steps. Students should not receive final written medical clearance until they have demonstrated successful completion of all stages of the graduated return-to-play process.

Table 8: Graduated return-to-play stages (McCrory et al, 2017)

Stage	Activity	Functional exercise at each stage of rehabilitation	Objective of stage
1	Symptom-limited activity	Daily activities that do not provoke symptoms.	Recovery
	<i>When 100% symptom free for 24 hours proceed to Stage 2. (recommend longer symptom-free periods at each state for younger student/athletes)</i>		
2	Light aerobic exercise	Walking or stationary cycling at slow to medium pace. No resistance training.	Increase heart rate
	<i>If symptoms re-emerge with this level of exertion, then return to the previous stage. If the student remains symptom free for 24 hours after this level of exertion, then proceed to the next stage.</i>		
3	Sport-specific exercise	Running or skating drills. No head-impact activities.	Add movement
	<i>If symptoms re-emerge with this level of exertion, then return to the previous stage. If the student remains symptom free for 24 hours after this level of exertion, then proceed to the next stage.</i>		
4	Non-contact training drills	Progression to more complex training drills, e.g. passing drills in football and ice hockey. May start progressive resistance training.	Exercise, coordination and increased thinking
	<i>If symptoms re-emerge with this level of exertion, then return to the previous stage. If the student remains symptom free for 24 hours after this level of exertion, then proceed to the next stage.</i>		

5	Full-contact practice	Following medical clearance, participate in normal training activities.	Restore confidence and assess functional skills by coaching staff
	<i>If symptoms re-emerge with this level of exertion, then return to the previous stage. If the student remains symptom free for 24 hours after this level of exertion, then proceed to the next stage.</i>		
6	Return-to-play	Normal game play.	No restrictions

6. Partnering with Families

Creating the culture of concussion awareness

Best practice in concussion assessment and response are changing at an increasingly rapid pace. This has resulted in a broad range of concussion knowledge and practice, much of which may not have kept up with the pace of this evolving field. Therefore, schools are a critical access point for engaging students and families by providing current, relevant concussion information, even before an injury occurs.

All students and their families should receive information about concussion recognition, the school’s concussion practices, and protocols for preventing and managing concussions. Information should be made available annually through means such as student/parent handbook, virtual backpack, Facebook updates, or factsheet distribution. Additionally, concussion information should be permanently accessible in commonly visited locations such as the school website or by hanging posters in common areas such as the school lobby, gymnasium, and school offices.

It is important to develop an environment where all students feel comfortable discussing concussions and reporting symptoms. Parents and staff should be encouraged to discuss concussions with the students. Coaches, PE teachers, and others should encourage concussion reporting and positively reinforce students for doing so. Students should also be praised for supporting their peer who is sitting out of play after a concussion.

The school should inform students and parents/guardians of the school’s practice and policies for removal from activity when a concussion is suspected or reported. This is also an opportunity to provide information to the family about whom to notify if their child sustains a concussion outside of the academic school day.

Supporting the family team

Once a concussion has been reported, the family becomes a vital part of the concussion management team. Prior to meeting with the concussion management team, information should be shared with the family regarding the purpose of the concussion management team, the importance of their participation, and the school’s “return-to-learn” and “return-to-play” protocols.

Education regarding concussion symptoms should be provided to the student and their family. Students should be encouraged to communicate any symptoms promptly to school staff and a parent/guardian. A symptom checklist can be used for tracking and reporting symptoms during a set period of time. Unless there is a specific recommendation from a health care provider for the frequency of symptom monitoring, symptoms should be checked daily for the first week, particularly during the first few days. It is critical that symptoms be monitored within the first 48 to 72 hours. Red flag symptoms that indicate the need for immediate medical attention include vomiting, seizure/convulsion, severe or increasing headache, unusual behavior change, double vision, complaints of neck pain or weakness or tingling/burning in arms or legs, or deteriorating conscious state. Symptom monitoring should continue with a frequency of at least three times during the second week and at least twice a week for the third week.

- A sample symptom checklist is available in Appendix B.

The quality and quantity of information provided by the student will depend on the individual's age and other factors. Therefore, it is recommended the student:

- Be educated about the signs and symptoms, including red flag symptoms, that must be reported to the coach, licensed athletic trainer, school nurse, parent/guardian, and/or other staff.
- Track and report symptoms, as appropriate.
- Follow instructions from their health care provider.
- Be encouraged to ask for help and to inform teachers of difficulties experienced in class and when completing assignments.

The parent/guardian should be involved in the concussion management team as the primary advocate for their child. When a concussion is reported, it is important that the family understand the need for communication with both the health care provider and the school. The family will likely have a number of questions during this time and be concerned about their child's well-being; therefore, the school has an important role in educating and engaging the family. It is recommended that the family:

- Be educated about the signs and symptoms of concussion, including when to seek emergency care.
- Help the student understand the importance of accurately reporting their concussion symptoms.
- Be informed regarding the Iowa concussion law and how the law may pertain to their child.
- Be informed of the school's concussion policies and protocols.
- Be made aware of the importance of rest along with the benefits of a gradual return to pre-injury levels of cognitive and physical activity.
- Be encouraged to ask questions and report concerns to their child's health care provider and the school as necessary.

- Participate in and/or inform the concussion management team discussions regarding the level of academic adjustments/accommodations provided by the school.
- Consider signing a release of information between the health care provider and the school nurse (or other member of the School Physical Team).
- Participate in and/or inform the concussion management team’s discussion regarding “return-to-play,” especially if the student has been medically cleared but school/home reports clearly indicate the student is still symptomatic or is not functioning at pre-injury levels in the learning environment.
- Provide the school with information and medical orders from the health care provider in a timely manner.
- Participate in the tracking and reporting of symptoms their child experiences, including significant fatigue or other symptoms at the end of the school day.
- Monitor their child’s physical and mental health during the transition back to full activity.

7. Providing Collaborative Care after a Concussion

The initial point of contact for students sustaining a concussion often begins with the health care provider, school nurse, or licensed athletic trainer. Each licensed or certified professional plays a key role in the concussion management team to promote the student’s recovery.

Medical team

Students may come into a primary care clinic, urgent care clinic, or emergency department soon after sustaining a concussion. The recognition and early appropriate management of a concussion are essential to improving the student’s health care outcomes. Health care providers play a critical role on the concussion management team. They provide education to the student and family regarding the typical course of a concussion, symptom management, and how brain rest promotes positive health outcomes after concussion.

The health care provider may include hospital providers, primary care providers, neurologists, and others who diagnose concussion routinely in their professional practice. Health care providers on the medical team experience the challenge of balancing school attendance with rest and recommending appropriate adjustments to ease cognitive demands, while being alerted to any increase in symptoms as academic adjustments are gradually removed. Appropriate adjustments at this stage may be informal changes made to the student’s academic day or during school-sanctioned activities that do not jeopardize the student’s curriculum or require alterations in standardized testing. Information collected by the concussion management team regarding the student’s symptoms at school and home should be shared with the health care provider, if applicable. The health care provider may use this information to determine when the student can begin a safe progression back into physical activity.

- Additional information regarding academic adjustments can be found in section 3: Implications for Learning - Acute Recovery.

Preexisting conditions

Health care providers understand the importance of reviewing pre-existing conditions with the student, such as:

- Migraines
- Headaches
- Learning disabilities
- Attention deficit hyperactivity disorder (ADHD)
- Visual disorders
- Motion sickness
- Other mental health conditions

For students who have experienced a concussion, preexisting conditions may have an impact on concussion symptoms or symptom recovery. The health care provider puts together the entire picture of the student's health status by uncovering underlying conditions, evaluating symptoms, and reviewing information regarding the student's health history. Provider visits and physical examinations are specifically targeted at identifying known deficits associated with concussion. The initial management of concussion begins with a recommendation for cognitive and physical rest, followed by a gradual increase in cognitive and physical activities, depending on current symptoms and prior history.

Information gathering and concussion symptoms

The medical team asks important questions to collect more information about the student's concussion. These may include:

- When, where, and how did your injury occur?
- Did you experience any symptoms immediately?
- Did you visit a health care provider for these symptoms; if so, who was it and where were you seen?
- What symptoms do you currently experience?
- What makes these symptoms better or worse?
- Are you taking any medications to treat symptoms? Which medications and how often?
- Have you noticed any changes in your activity level or tolerance at school? At home? With electronic devices?
- How have you been sleeping at night? Is this a change?

As stated earlier, the medical team relies on communication with the family, the student, the school physical team, and the school academic team to monitor the student's recovery after sustaining a concussion. This information is used to formulate a plan of care for safely returning to learn and then returning to physical activities.

Navigating HIPAA and FERPA

Health care providers are aware that a student's health information is private and protected by the Health Insurance Portability and Accountability Act (HIPAA). Additionally, educational

records, which include those created by the school nurse or other school personnel, are protected by the Family Educational Rights and Privacy Act (FERPA). To facilitate open communication between the medical team and rest of the concussion management team, the health care provider should obtain a signed release of medical information from the parent or guardian to communicate with school personnel. The school may also request the parent to sign a consent to communicate with the health care provider. Valuable information shared between the medical provider and school related to the student’s concussion includes symptom tracking and medical findings that can be used to promote implementation of the concussion management plan. Parents who are not comfortable with the school nurse, licensed athletic trainer, or academic team communicating directly with the medical team may choose to facilitate sharing select information with the appropriate team.

Communication and cross-team collaboration

The concussion management team relies on the expertise and collaboration of its members to problem solve difficulties or concerns that may arise during the student’s concussion recovery. Communication among the concussion management team members is vital to the success of implementing a student’s concussion management plan. Periodic updates provided to the school nurse and the licensed athletic trainer regarding the health services received and follow-up visits to the medical provider will promote continuity of care between settings. Information related to the student’s recovery, including the presence or absence of symptoms as well as any specific modifications or restrictions required, is especially important to share with all school and medical team members.

The medical team provides the concussion diagnosis and may also use the REAP concussion management manual to coordinate care with the student’s school or family. With access to applicable regulations and school policy, the school may benefit from the medical team’s participation in making appropriate recommendations for both return-to-learn and return-to-play, including the documentation of needed short-term or long-term supports. Together, the concussion management team can determine and implement necessary short-term adjustments. Long-term accommodations, if needed by the student, will require a formalized plan. This includes obtaining consent for evaluation and following an outlined process completed by the school academic team. Section 504 of the Rehabilitation Act or the Individualized Disabilities Education Act (IDEA) are the two formal processes that may be used to create a customized plan for the student.

Understanding IDEA and Section 504 of the Rehabilitation Act

All members of the concussion management team work together to implement the identified plan. The objective of this plan is to promote positive health outcomes and academic success for every student who experiences a concussion.

Table 9: IDEA and Section 504 Plan crosswalk

	IDEA (Parts B and C)	Section 504 Plan
Definition in Law	<ul style="list-style-type: none"> Specific disability categories as defined in the law can include autism, deafness, deaf- 	Defines persons with disabilities who:

	<p>blindness, hearing impairments, intellectual disability, multiple disabilities, orthopedic impairments, health impairments, serious emotional disturbance, specific learning disabilities, speech or language impairments, traumatic brain injury, or visual impairments. Iowa determines eligibility based on a documented educationally relevant need rather than a specific disability category.</p> <ul style="list-style-type: none"> • Covers students with educational disabilities that require specialized instruction and/or related services. • Not all students with disabilities are eligible for services. 	<ul style="list-style-type: none"> • Have a physical or mental impairment that substantially limits one or more major life activities • Have a record of such an impairment • Are regarded as having such an impairment (Major life activities include, but are not limited to: walking, seeing, hearing, speaking, breathing, learning, working, caring for oneself, sleeping, concentrating, and performing manual tasks.)
Requirements in Law	Provide a free appropriate public education in the least restrictive environment.	Requires any agency, school or institution receiving federal financial assistance to provide persons with disabilities, to the greatest extent possible, an opportunity to be fully integrated into the mainstream.
Who is Covered	Covers students with educational disabilities that require special education services birth-21 or until graduation.	Protects all persons with a disability from discrimination in educational settings based on disability
Services Provided	Offers educational services that are remedial in addition to services available to all mainstream students.	Eliminates barriers that would prevent a student from full participation in school

Addressing barriers

Barriers may exist when providing concussion education to students and families. Instructions provided during a primary care or emergency visit may not be retained due to the associated stress of the injury. Verbal instructions may be forgotten and printed instructions may not be fully understood. Members of the school physical team, such as the school nurse or licensed athletic trainer, can play an important role in providing basic information about concussion and in helping to dispel some of the myths regarding concussion recovery. Information given to the family should be written below an eighth-grade level and explained in the family’s or student’s preferred language. Information may include post-concussion signs and symptoms, red-flag signs and symptoms that require immediate medical care, and when to consider a referral to other specialists for additional services.

The role of the school nurse and/or licensed athletic trainer

Students who experience a concussion may need guidance and support throughout the process of managing the school day and the process of returning to physical activity. As part of the concussion management team, the school nurse and the licensed athletic trainer collect

valuable assessment information that assists the student in monitoring their own concussion symptoms and for reporting that information to the team.

The school nurse is the professional practitioner who is responsible for overseeing and coordinating health services, health policies, and health programs in the school community. The school nurse provides students with health services to minimize absenteeism and promote equal access to education. Students who have experienced a concussion may require nursing and health services at school to access academics or school-sanctioned activities. Mandatory education attendance laws require that students with mental or physical health needs must have access to health services at school pursuant to Iowa Code 299. School nurse services, designed and implemented to meet the student's health needs, are documented in an individual health plan (IHP). The IHP is written by the school nurse and utilizes the nursing process as required in Iowa's Nurse Practice Act. The components of an IHP at a minimum contain nursing assessment data, nursing diagnosis, interventions, planning, student-centered outcomes, and evaluation results. School nurses evaluate the school environment for barriers that a student may experience following a concussion. School nurses collect valuable information regarding the student's progress during recovery and report worsening symptoms to the concussion management team. This information becomes especially valuable when determining the appropriate pace for "return-to-learn" and the need for additional academic adjustments.

The licensed athletic trainer provides students with physical reconditioning, which is carried out under the oral or written orders of a health care provider, with the permission of the student's parents. The licensed athletic trainer works directly with school administration or the athletic director to establish a service plan that is under the direction of a physician. The plan should contain the student's name and any other identifying information, referral source, date of service, initial assessment, results, program plan (with estimated length), program methods, outcomes, revisions, date of discontinuation, and summary. The licensed athletic trainer communicates the assessment results, program plans, and recovery progress with other members of the concussion management team.

The school nurse and the licensed athletic training each provide critical support and expertise as a part of the school physical team. It is crucial to establish a strong working relationship between all individuals supporting the student to ensure timely and consistent communication regarding the student's health and progress during recovery from concussion.

8. Developing a Concussion Management Protocol

Concussion Guidelines for Iowa Schools; the REAP concussion management manual; CDC's "HEADS UP" materials, and the *Consensus statement on concussion in sport - the 5th international conference on concussion in sport held in Berlin, October 2016* should be incorporated into a concussion protocol for your school. Given that each school in Iowa is unique, the processes and forms utilized may vary depending on the specific needs of the school.

Getting started

A good first step is to form a workgroup that will be responsible for developing a concussion management protocol for your school. Include individuals from a variety of disciplines within the school and community, such as those from the multi-disciplinary team outlined in Table 10, to ensure that a well-rounded group of knowledgeable individuals participates in, or provides input to, the workgroup.

Prior to drafting a concussion protocol, the workgroup should determine what are the current policies or optimal practices being used that could potentially be incorporated into this process. For example, the following questions may be helpful when developing a concussion management protocol:

- What is the practice for notifying a parent/guardian when an injury occurs during the school day or during school activities?
- What is the process parents use to report an injury or illness to the school?
- How is information about a concussion communicated between the extracurricular and the academic settings?
- How are medical, cognitive, or activity restrictions and releases documented and communicated?
- What is the process for documenting medical needs, making temporary academic adjustments, and communicating student-specific needs to staff?
- How is it documented and communicated when a student is symptom-free, no longer requires academic adjustments, or is medically cleared to return-to-play?
- How are concussions currently being managed in compliance with Iowa Code 280.13C?
- How are concussions currently being managed, for all students regardless of age?
- When applicable, who in addition to the school nurse should be responsible for communicating with medical providers?

The workgroup should also prepare for their initial meeting by reviewing *Concussion Management Guidelines for Iowa Schools*, the REAP concussion management manual adapted for Iowa, “HEADS UP” materials from the CDC, and other current literature regarding concussion management best practices.

- Links to the documents mentioned above are available in the resources list in Appendix A.

Components of a good concussion management protocol

When creating a concussion management protocol for your school, it is important that the protocol incorporates the following components:

- Describes your school’s commitment to safety and concussion prevention.
- Briefly describes what constitutes a concussion, including typical signs and symptoms.

- Describes the method and frequency for providing education and training regarding concussions and concussion management, including identification of target audiences.
- Explains the role of the concussion management team and the point of contact for reporting suspected concussions.
- Supports **all** students, including both athletes and non-athletes.
- Outlines the process for concussion documentation and how various information will be communicated to all team members.
- Outlines a plan for supporting students returning-to-learn.
- Provides a process for safely returning students to physical activity following a concussion.
- Indicates how often the protocol will be reviewed (at least every three years) to ensure new knowledge about concussion and concussion management is incorporated into the protocol and is consistent with Iowa law and national best practices.

Concussion management process

Step 1: Concussion management team is established and concussion education is provided.

- Set an expectation regarding student safety and share information on concussion prevention.
- Every year, share general information about concussions with students, families, coaches, teachers, and other adults who may have a responsibility to report an injury. Topics should include how to identify a concussion (signs and symptoms), the importance of removing the student from activity, and the process for reporting injuries.
- Identify who will serve as your school’s concussion management team leader(s) to act as the central point of communication and coordinates the concussion management team process. This person should be someone who is regularly available within the school.
- Determine a core set of leaders within your school who should participate on every concussion management team. It is recommended to have consistent person identified as a “School Academic Team Leader” and a “School Physical Team Leader.”
- Provide the concussion management team members with concussion training, including the role/responsibility of each team member and the protocol for “return-to-learn” and “return to activity.”
- Communicate with teachers and staff about the role of the concussion management team, the need for their potential participation as a team member, and their role in providing the team with information during a student’s recovery from concussion.
- At the beginning of each sport season, meet with coaches and licensed athletic trainers to provide concussion education on the signs/symptoms of concussion, risks, concussion management and your school’s protocol.

- At the beginning of each school year, meet with physical education teachers and recess supervisors to provide concussion education on the signs/symptoms of concussion, reducing risks, concussion management, and your school's protocol.
- Display concussion information in publicly available areas within the school building as well as in newsletters and online.
- Provide education to teachers and staff about concussion symptoms, how concussion may affect academic learning and performance, and possible adjustments a student might need when recovering from concussion. Information about the school's concussion protocol, including the role of the concussion management team should also be shared.

Step 2: Suspected concussion occurs and student is removed from activity

- If an injury occurs during school or at a school event, remove the student immediately from activity and notify the family. Information regarding the injury is gathered, documented, and shared with the parent/guardian. Concussion information, including the school's concussion management protocol, is provided to the family.
 - A responsible adult should remain with the student and continue to monitor for deterioration during the initial few hours after injury. The student should not be allowed to drive.
 - If the injury occurs outside of school, the family should report the injury to the school.
 - Remove the student from all physical activities such as PE, recess, and athletics. Student may also need to be removed from activities such as band, choir, and music.
- For more information on best practice recommendations for removal from play, see section 5: Return to Activity & Play.

Step 3: Communication between the family and concussion management team

- When the student returns to school, the concussion management team leader gathers information from the student and family about how the concussion symptoms are affecting the student. Information about any medical, cognitive, and physical restrictions that are in place should also be collected. This includes what restrictions the family has put in place at home.
- The REAP manual (or online link to the manual) is provided to the family if the student is returning to school while still experiencing concussion symptoms.
- Table 2 outlines the four components of the concussion management team, including the discipline or title of various individuals who should be included as team members. This list is not comprehensive and, to best support the student, the school needs to determine whether there are additional individuals who need to be notified of the

concussion. While forming the team, consider what will be the optimal method for communicating with the various team members: verbal, written, or electronic.

- The concussion management team leader coordinates the communication and documentation of information regarding the injury, how the concussion symptoms are impacting the student, and any follow-up medical instructions.
- It is important to note that not all students will be under medical care for their concussion. In these instances, the school concussion protocol and recommendations from the REAP concussion management manual still apply.

➤ A link to the REAP manual can be found in the resources list in Appendix A.

Step 4: Collect information

- The concussion management team leader will act as the point person for gathering, documenting, and sharing information regarding the student's concussion recovery, including classroom adjustments needed and symptoms reported or observed.
- Determine the frequency with which information is collected, documented, and communicated (recommendations are included in section 4: Implications for Learning – Acute Recovery).
- Staff should be required to submit feedback, even if no symptoms are observed and it is perceived that the student is progressing well.
- As a school team, review current methods for documenting other health concerns/injuries and academic adjustments. If the school has the ability to document information electronically, this may help with tracking and trending the educational impact of concussions.
- At a minimum, it is recommended that schools document when the injury occurred, when the student is “symptom free,” and when the student obtained medical clearance.
- Student history of concussion should be gathered to track potential progressive impact of repetitive head injuries. This may include information such as how many concussions the student has experienced, the number of school absences due to each concussion, and length of recovery from each concussion.

Step 5: Share information

- Determine who should have access to routine updates regarding the student's progress. Regularly share information collected about the student's symptoms and academic performance during the recovery phase with the concussion team as well as others who may need this information to better support the student.

- If the student is receiving medical care, the family should be encouraged to share information collected at school with the health care provider, or proper releases should be obtained to allow the school to communicate with the health care provider directly.
- Additional information about coordinating communication across settings is available in section 7: Providing Collaborative Care after a Concussion.

Step 6: Return-to-learn & assess academic needs

- Repeat Steps 3-5 until the student is symptom free. The concussion management team should continue to monitor the student, provide appropriate adjustments, and assess progress.
- In the event a student is in a transition period (such as between sport seasons, semesters, or academic years), information regarding the injury needs to be communicated to the receiving authority and new concussion management team members may be needed.
- See section 3: Implications for Learning – Acute Recovery for information on academic adjustments and the process for evaluating the student’s tolerance of increased cognitive demands.

Step 7: Team determines student is symptom free

- As the student recovers, their symptoms and need for academic adjustments may also decrease or change. Students should not be released to full physical activity until they have returned to school fully and are meeting pre-injury cognitive demands.
- Using the information collected during the recovery phase (steps 3-5), the team will determine whether the student is ready to move on to Step 8. This information should be clearly documented that the student is no longer symptomatic, no longer requires academic adjustment for the concussion, is no longer using medication to manage concussion symptoms (including over the counter medication), and has returned to academic baseline.
- Information supporting that the student is “symptom free” within the school setting should be provided to the parent/guardian and healthcare provider. The health care provider should utilize this information along with their own clinical assessment and expertise to determine where the student is in the recovery process and whether additional actions are recommended.

Step 8: Graduated return-to-play

- Students who continue to require academic adjustments related to concussion symptoms **should not** be returned to play.
- Iowa Code 280.13C should be referenced for Iowa law requirements.

- After successful completion of the graduated return-to-play protocol, the health care provider can give final clearance. If no health care provider is involved, the parent/guardian can give written permission for return to activity/play. Student athletes covered by Iowa's concussion law are required to have medical clearance from a healthcare provider prior to returning to their sport.
 - The school physical team should continue to communicate with the family and school academic team by sharing information about the student's recovery process while progressing through the graduated return-to-learn steps because **increased physical activity may cause concussion symptoms to re-develop.**
- See section 5: Return to Activity & Play for recommended best practices.

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This document is available online, without charge, at the Iowa Department of Education <https://www.educateiowa.gov/student-health-conditions>

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Appendix A: Resources

PRINTABLE MATERIAL

IHSA and IGSAU Concussion Management Protocol

https://www.iahsaa.org/Sports_Medicine_Wellness/Concussions/Concussion_RTP_Protocol_052212.pdf

REAP Concussion Management manual

<http://biaia.org/ICC/reap-full-publication.pdf>

Brain Injury Quick Guide: Information and Resources for Teachers & School Staff

<https://idph.iowa.gov/Portals/1/Files/ACBI/Brain%20Injury%20Quick%20Guide%20For%20Schools%20july.pdf>

CDC Heads Up to Schools

<https://www.cdc.gov/headsup/schools/>

Get Schooled on Concussion

<http://www.getschooledonconcussions.com/>

Concussion Recognition Tool 5

<http://bjsm.bmj.com/content/51/11/872>

Sport Concussion Assessment Tool (SCAT3) – 3rd Edition

<http://bjsm.bmj.com/content/bjsports/47/5/259.full.pdf>

Sport Concussion Assessment Tool (SCAT5) – 5th Edition

<http://bjsm.bmj.com/content/bjsports/early/2017/04/28/bjsports-2017-097506SCAT5.full.pdf>

Child SCAT5 Sports Concussion Assessment Tool for Children ages 5 to 12 (for use by medical professionals only)

<http://bjsm.bmj.com/content/bjsports/early/2017/04/26/bjsports-2017-097492childscat5.full.pdf>

WEBSITES

Iowa Department of Education, Student Health Conditions

<https://www.educateiowa.gov/student-health-conditions>

Iowa Department of Public Health, Brain Injury Services Program

<http://idph.iowa.gov/brain-injuries>

Iowa High School Athletic Association, concussion page

http://www.iahsaa.org/Sports_Medicine_Wellness/Concussions/concussions.html

Brain Injury Alliance of Iowa (BIA-IA), Resource Facilitation Program

1-855-444-6443 or info@biaia.org for more information and support
<http://biaia.org/>
www.lowaConcussion.org

BIA-IA brain injury resource virtual tote bag <http://biaia.org/support.htm>

ASK Resource Center
<http://askresource.org/resources/>

BrainLine Kids
http://www.brainline.org/landing_pages/features/blkids.html

Brain STEPS: Strategies Teaching Educators, Parents, & Students
<http://www.brainsteps.net>

CDC's Heads Up
<https://www.cdc.gov/headsup/index.html>

Center on Brain Injury Research and Training (CBIRT)
<http://cbirt.org>

Project LEARNet from BIANYS
<http://www.projectlearnet.org/>

VIDEOS

Brain Injury Alliance of Iowa – REAP Concussion Management Protocol
https://www.youtube.com/playlist?list=PLHHCQ1nyoAofPHvzMRLTnG-fBRs0t_Zve

Helping Students with Brain Injuries online video series (module 4: Concussion)
www.training-source.org

Brain 101
<https://www.youtube.com/watch?v=5hlm3FRFYU>

CDC Heads UP concussion videos
<https://www.cdc.gov/headsup/resources/videos.html>

CDC Heads Up to Youth Sports: Online Training
<https://www.cdc.gov/headsup/youthsports/training/index.html>

National Federation of State High School Associations' Concussion in Sports video (required for coaches)
<https://nfhslearn.com/courses/61064/concussion-in-sports>

APPS (available for free)

HEADS UP Concussion and Helmet Safety app

Apple Store: <https://itunes.apple.com/us/app/cdc-heads-up-concussion-helmet/id999504040?mt=8>

Google Play: <https://play.google.com/store/apps/details?id=gov.cdc.headsup&hl=en>

HEADS UP Rocket Blades (available in Apple App Store. Android version coming soon)

<https://itunes.apple.com/us/app/cdc-heads-up-rocket-blades-the-brain-safety-game/id1212332624>

Appendix B: Symptom checklist

Credit: HCA HealthONE, 2016

Student name:	Date:			Time:			
Person completing checklist (if not the student):	<input type="checkbox"/> baseline*			<input type="checkbox"/> post injury*			
Symptoms	Severity Rating						
I feel like I'm going to faint	0	1	2	3	4	5	6
I'm having trouble balancing	0	1	2	3	4	5	6
I feel dizzy	0	1	2	3	4	5	6
It feels like the room is spinning	0	1	2	3	4	5	6
Things look blurry	0	1	2	3	4	5	6
I see double	0	1	2	3	4	5	6
I have headaches	0	1	2	3	4	5	6
I feel sick to my stomach (nauseated)	0	1	2	3	4	5	6
Noise/sound bothers my eyes	0	1	2	3	4	5	6
The light bothers my eyes	0	1	2	3	4	5	6
I have pressure in my head I feel numbness and tingling	0	1	2	3	4	5	6
I feel numbness and tingling	0	1	2	3	4	5	6
I have neck pain	0	1	2	3	4	5	6
I have trouble falling asleep	0	1	2	3	4	5	6
I feel like sleeping too much	0	1	2	3	4	5	6
I feel like I am not getting enough sleep	0	1	2	3	4	5	6
I have low energy (fatigue)	0	1	2	3	4	5	6
I feel tired a lot (drowsiness)	0	1	2	3	4	5	6
I have trouble paying attention	0	1	2	3	4	5	6
I am easily distracted	0	1	2	3	4	5	6
I have trouble concentrating	0	1	2	3	4	5	6
I have trouble remembering things	0	1	2	3	4	5	6
I have trouble following directions	0	1	2	3	4	5	6
I feel like I am moving at a slower speed	0	1	2	3	4	5	6
I don't feel "right"	0	1	2	3	4	5	6
I feel confused	0	1	2	3	4	5	6
I have trouble learning new things	0	1	2	3	4	5	6
I feel like my thinking is "foggy"	0	1	2	3	4	5	6
I feel sad	0	1	2	3	4	5	6
I feel nervous	0	1	2	3	4	5	6
I feel irritable or grouchy	0	1	2	3	4	5	6
I feel more emotional	0	1	2	3	4	5	6
Other:	0	1	2	3	4	5	6

*For baseline, student should rate symptoms based on how he/she typically feels.
For post-injury, student should rate symptoms, at this point in time.

Appendix C: Teacher feedback form

Credit: HCA HealthONE, 2016

Student Name: _____

<p>Student: As part of your concussion recovery monitoring, it is your responsibility to gather data from your teachers. A day or two before your next concussion follow up appointment with the concussion management team or your health care provider, please take this sheet to your teachers.</p>	<p>Teachers: Thank you for your help with this student. Your feedback is very valuable. We do not want to release this student back to physical activity if you are still seeing physical, cognitive, emotion or sleep/energy symptoms in your classroom. Use the space below to share any concerns you may have regarding the student's post-concussion related performance.</p>		
<p>Teacher name & Class taught</p>	<p>Is the student still receiving any academic adjustments in your class? If so, what?</p>	<p>Have you recently noticed, or has the student reported, the student is experiencing any concussion symptoms? (refer to concussion symptom checklist)</p>	<p>Do you believe this student is performing at their pre-concussion learning level?</p>
			<p><input type="checkbox"/> Yes <input type="checkbox"/> No Date: Signature:</p>
			<p><input type="checkbox"/> Yes <input type="checkbox"/> No Date: Signature:</p>
			<p><input type="checkbox"/> Yes <input type="checkbox"/> No Date: Signature:</p>

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