



NORTH DAKOTA
BRAIN INJURY
NETWORK

How every family, school and medical professional can implement a
Community-Based Concussion Management Program

REAP® The Benefits of Good Concussion Management

REAP®

Remove/Reduce
Educate
Adjust/Accommodate
Pace

Authored by Karen McAvoy, PsyD

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Third Edition 2018



In November of 2013, the American Academy of Pediatrics released a Clinical Report on Returning to Learning Following a Concussion (PEDIATRICS Volume 132, Number 5, November 2013) "based upon expert opinion and adapted from a program in Colorado". The program referenced in the AAP Clinical Report is REAP!

Welcome to REAP Version 2.0 (2019)!

The North Dakota Brain Injury Network (NDBIN) is pleased to provide the REAP concussion management program for North Dakota communities. THE REAP approach, developed by a school psychologist with both urban and rural schools in mind, offers guidance on a coordinated team approach that will lessen the frustration that students/athletes, parents, schools, coaches, certified athletic trainers and medical professionals often experience as they attempt to coordinate care.

NDBIN has provided North Dakota with brain injury services since 2009. NDBIN has several programs that can help brain injury survivors, family members, professionals, caregivers and friends. We are pleased to be able to offer this additional resource to your community and have chosen REAP because it has grown as a training resource over the past five years and it is continually updated with the most current research and guidance.

Printing and distributing of REAP is one important way in which NDBIN supports your community. NDBIN, as the resource hub for brain injury services throughout the state of North Dakota, will support this collaboration to integrate REAP throughout the state and to coordinate the many services needed to support our athletes post-injury. It is our privilege to assist North Dakota in this way.

Rebecca Quinn
LMSW, CBIST/Program Director for NDBIN

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REAP,[®] which stands for **Remove/Reduce • Educate • Adjust/Accommodate • Pace**, is a **community-based model for Concussion Management** that was developed in Colorado. The early origins of REAP stem from the dedication of one typical high school and its surrounding community after the devastating loss of a freshman football player to "Second Impact Syndrome" in 2004. The author of REAP, Dr. Karen McAvoy, was the psychologist at the high school when the tragedy hit. As a School Psychologist, Dr. McAvoy quickly pulled together various team members at the school (Certified Athletic Trainer, School Nurse, Counselors, Teachers and Administrators) and team members outside the school (Students, Parents and Healthcare Professionals) to create a safety net for all students with concussion. Under Dr. McAvoy's direction from 2004 to 2009, the interdisciplinary team approach evolved from one school community to one entire school district. Funded by an education grant from MINDSOURCE Brain Injury Network in 2009, Dr. McAvoy sat down and wrote up the essential elements of good interdisciplinary team concussion management and named it REAP thereby creating a model for concussion management that can be utilized by any community.



The benefits of good concussion management spelled out in REAP are known throughout communities in Colorado, nationally and internationally. REAP has been customized and personalized for various states and continues to be the "go-to" guide from the emergency department to school district to the office clinic waiting room.

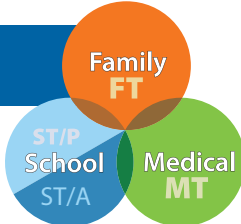
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MINDSOURCE
BRAIN INJURY NETWORK





How to use this Manual

Because it is important for each member of the Interdisciplinary Concussion Management Team to know and understand their part and the part of other members, this manual was written for all of the teams. As information is especially pertinent to a certain group, it is noted by a color.

» Pay close attention to the sections in **ORANGE**

FT	Family Team	Student, Parents; may include Friends, Grandparents, Primary Caretakers, Siblings and others...	For more specific information, download parent fact sheets from the various "Heads Up" Toolkits on the CDC website: https://www.cdc.gov/headsup/parents/index.html
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» Pay close attention to the sections in **LIGHT BLUE**

ST/P	School Team Physical	Coaches, Certified Athletic Trainers (AT), Physical Education Teachers, Playground Supervisors, School Nurses and others...	For more specific information, download the free "Heads Up: Concussion in High School Sports or Concussion in Youth Sports" from the CDC website: https://www.cdc.gov/headsup/highschoolsports/index.html
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» Pay close attention to the sections in **DARKER BLUE**

ST/A	School Team Academic	Teachers, Counselors, School Psychologists, School Social Workers, Administrators, School Neuropsychologists and others...	For more specific information, download the free "Heads Up to Schools: Know Your Concussion ABCs" from the CDC website: https://www.cdc.gov/headsup/schools/index.html
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» Pay close attention to the sections in **GREEN**

MT	Medical Team	Emergency Department, Primary Care Providers, Nurses, Concussion Specialists, Neurologists, Clinical Neuropsychologists & others...	For more specific information, download the free "Heads Up: Brain Injury in your Practice" from the CDC website: https://www.cdc.gov/headsup/providers/index.html
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Common Concussion Myths...

TRUE or FALSE?

Loss of consciousness (LOC) is necessary for a concussion to be diagnosed.

False! In 2012, approximately 430,000 Emergency Department (ED) visits resulted from sports and recreation-related mild traumatic brain injuries (mTBI).¹ Most concussions do not involve a loss of consciousness. While many students receive a concussion from sports-related activities, numerous other concussions occur from non-sports related activities – from bicycle and playground accidents.

TRUE or FALSE?

A concussion is just a “bump on the head.”

False! Actually, a concussion is a traumatic brain injury (TBI). The symptoms of a concussion can range from mild to severe and may include: confusion, disorientation, memory loss, slowed reaction times, emotional reactions, headaches and dizziness. You can't predict how severe a concussion will be or how long the symptoms will last at the time of the injury.

TRUE or FALSE?

A parent should awaken a child who falls asleep after a head injury.

False! Current medical advice is that it is not dangerous to allow a child to sleep after a hit to the head IF the child has been medically evaluated and more serious complications have been ruled out. Once a medical evaluation results in the diagnosis of concussion and not something more serious, then the best treatment is to allow the child to sleep.

TRUE or
FALSE?

A concussion is usually diagnosed by neuroimaging tests (i.e. CT scan or MRI).

False! Concussions cannot be detected by neuroimaging tests: a concussion is a “functional” not “structural” injury. Concussions are typically diagnosed by careful examination of the signs and symptoms after the injury. Symptoms during a concussion are thought to be due to an ENERGY CRISIS in the brain cells. At the time of the concussion, the brain tries to protect itself by decreasing blood flow to injured areas. Because of the injury there is not enough “fuel” (sugar/glucose) delivery to keep brain cells (neurons) working normally – for playing and for thinking. Over time, this blood flow returns to normal as symptoms improve. While a CT scan or an MRI may be used after trauma to the head to look for bleeding or bruising in the brain, it will present as (be read as) “normal” with a concussion. A negative scan does not mean that a concussion did not occur.





Did You Know...

» **More than 70% of concussions resolve successfully** if managed well within the first four weeks post-injury.² REAP sees the first four weeks post-injury as a “window of opportunity” to maximize positive outcomes. Research shows that the average recovery time for a child/adolescent is about 28 days, slightly longer than the average recovery time for an adult.³

» **REAP works on the premise that a concussion is best managed by an Interdisciplinary Team** that includes: the Student/Athlete, the Family, various members of the School Team and the Medical Team. The unique perspective from each of these various teams is essential!

» **The first day of the concussion is considered Day One.** The first day of recovery also starts on Day One. REAP can help the Family, School and Medical Teams mobilize immediately to maximize recovery during the entire four week “window of opportunity.”

Medical note
from Billy Haug, MD

“Whether it is on the playing field or in a clinical setting, teamwork is of paramount importance in both the prevention and treatment of head injuries. Through education of the involved team members, REAP has prioritized the essence of what is vital in management of sports related closed head injuries.”

Message to Parents

To maximize your child’s recovery from concussion, double up on the R’s: REDUCE and REST! Insist that your child rest, especially for the first few days following the concussion and slightly cut back extra-curricular and social activities over the four week recovery period. Some symptoms of concussion can be so severe on the first day or two that your child may need to stay home from school. When your child returns to school, request that he/she be allowed to “sit out” of sports, recess and physical education classes. Work with your Interdisciplinary Concussion Management Team to determine when your child is ready to return to physical activity, recess and/or PE classes (see PACE).

Don’t let your child convince you he/she will rest “later” (after the prom, after finals, etc.). Rest must happen immediately! The school team will help your child reduce their academic load [see Adjust/Accommodate]. However, it is your job to help to reduce sensory load at home. Advise your child/teen to:

- Avoid loud group functions (games, dances)
- Limit, (do not fully restrict) video games, text messaging, social media and computer screen time
- Limit, (do not fully restrict) reading and homework

A concussion will almost universally slow reaction time; therefore, driving should not be allowed pending medical approval or until a parent has made the effort to supervise driving again.

Plenty of sleep and quiet, restful activities after the concussion maximizes your child’s chances for a great recovery!

When should your child go back to school? See page 8.

EVERY Member of Every Team is Important!

Every team has an essential part to play at certain stages of the recovery



First The School Team/Physical (coach, AT, playground supervisor) and/or the Family Team (parent) have a critical role in the beginning of the concussion as they may be the first to **RECOGNIZE** and **IDENTIFY** the concussion and **REMOVE** the student/athlete from play.

Second The Medical Team then has an essential role in **DIAGNOSING** the concussion and **RULING-OUT** a more serious medical condition.

Third For the next 1 to 4 weeks the Family Team and the School Team/Academic will provide the majority of the **MANAGEMENT** by **REDUCING** social/home and school stimulation.

Fourth When all **FOUR** teams decide that the student/athlete is 100% back to pre-concussion functioning, the Medical Team can approve the Graduated Return to Sport (RTS) steps. See the **PACE** page.

Finally When the student/athlete successfully completes the RTS steps, the Medical Team can determine final "clearance."

Throughout this book, the terms Return to School, Return to Learn, Return to Activity and Return to Sport are used distinctly and intentionally. However, because they all start with the words "Return to ...", there is much confusion. These definitions will help:

Return to School is defined as the process of the student physically walking back into a school setting. The decision to send a child to school on any given day is directed by the parent and is dependent upon the student's ability to manage symptoms well enough to be physically and cognitively present in the classroom to listen and learn [See 'Adjust/ Accommodate for Parents' on Page 8]

Return to Learn is defined as the process by which educators help students with concussion maximize learning while minimizing symptom flare-ups. A successful Return to Learn plan is directed by educators, especially general education teachers, who have knowledge and skill in differentiated instruction to meet the needs of all students regardless of medical, psychological, learning, behavioral or social conditions [See 'Adjust/Accommodate for Educators' on Page 9].

Return to Activity is defined as the process of encouraging a person with a concussion to begin to add in sub-symptom threshold levels of physical and cognitive activity **WHILE** still in the recovery phase. A gradual re-introduction of cognitive, social and cardio activity (safe aerobic activity under close supervision) has been found to be therapeutic.⁴ Return to Activity differs from the progressive Graduated Return to Sport and it is not intended to take the place of the Graduated Return to Sport. Return to Activity happens prior to Graduated Return to Sport with the goal of contributing to asymptomatic status, thus allowing for the start of the Graduated Return to Sport. Widely applied, Return to Activity is a positive term used to encourage people recovering from concussion to stay engaged in their own physical, cognitive and emotional rehabilitation.

Graduated Return to Sport is the process of progressively returning athletes back to sport once they are 100% symptom-free [See 'PACE' on page 12].

An "Interdisciplinary Team" = Adults who provide multiple perspectives of the student/athlete AND who provide multiple sources of data to gauge recovery status

Who will be on the Family Team (FT)? Who from the family will watch, monitor and track the emotional and sleep/energy symptoms of the concussion and how will the Family Team communicate with the School and Medical Teams?

Who will be on the School Team/Physical (ST/P)? Who at the school will watch, monitor and track the physical symptoms of the concussion? Who is the ST/P Point Person?

Who will be on the School Team/Academic (ST/A)? Who at the school will watch, monitor and track the academic and emotional effects of the concussion? Who is the ST/A Point Person?

Who will be on the Medical Team (MT)? How will the MT get information from all of the other teams and who with the MT will be responsible for coordinating data and updates from the other teams?

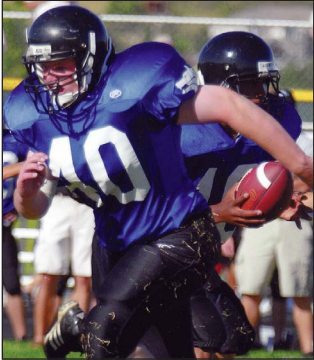
» REAP suggests the following timeframe:

TEAM		Week 1	Week 2	Week 3 & Week 4
FT	<p>Family Team* Help child understand he/she must be a "honest partner" in the rating of symptoms</p>	<ul style="list-style-type: none"> Impose rest. Assess symptoms daily – especially monitor sleep/energy and emotional symptoms. 	<ul style="list-style-type: none"> Continue to assess symptoms (at least 3X week or more as needed), monitor if symptoms are improving. Continue to assess symptoms and increase/decrease stimulation at home accordingly 	<ul style="list-style-type: none"> Continue with all assessments (at least 2X week or more as needed). Continue to assess symptoms and increase/decrease stimulation at home accordingly.
ST/P	<p>School Team/Physical Coach/AT/School Nurse (Assign 1 point person to oversee/manage physical symptoms)</p>	<ul style="list-style-type: none"> REMOVE from all play/physical activities! Assess physical symptoms daily, use objective rating scale. AT: assess postural-stability (see NATA reference in RESOURCES). School Nurse: monitor visits to school clinic. If symptoms at school are significant, contact parents and send home from school. 	<ul style="list-style-type: none"> Continue to assess symptoms (at least 3X week or more as needed). AT: Continue postural-stability assessment, as needed. School Nurse: Continue to monitor visits to school clinic. Work with student to manage symptoms by taking "pacing" and "strategic rest" breaks so student can ideally be at school daily for full days. See ADJUST/ACCOMMODATE section. 	<ul style="list-style-type: none"> Continue with all assessments (at least 2Xweek or more as needed). AT: Continue postural-stability assessment, as needed. School Nurse: Continue to monitor visits to school clinic. Work with student to manage symptoms by taking "pacing" and "strategic rest" breaks so student can ideally be at school daily for full days. See ADJUST/ACCOMMODATE section.
ST/A	<p>School Team/Academic Educators, School Psychologist, Counselor, Social Worker (Assign 1 point person to oversee and manage academic and emotional symptoms)</p>	<ul style="list-style-type: none"> REDUCE (do not eliminate) all cognitive demands. Meet with student periodically to create academic adjustments for cognitive/emotional reduction no later than Day 2/3 and then assess again by Day 7. Educate all teachers on the symptoms of concussion. See ADJUST/ACCOMMODATE section. 	<ul style="list-style-type: none"> Continue to assess symptoms (at least 3X week or more as needed) and slowly increase/decrease cognitive and academic demands accordingly. Continue academic adjustments, as needed. 	<ul style="list-style-type: none"> Continue to assess symptoms (at least 2X week or more as needed) and increase/decrease cognitive and academic demands accordingly. Continue academic adjustments, as needed. Assess if longer term academic accommodations are needed (May need to consider a 504 Plan beyond 4+ weeks).
MT	<p>Medical Team</p>	<ul style="list-style-type: none"> Assess and diagnose concussion. Assess for head injury complications, which may require additional evaluation and management. Recommend return to school with academic adjustments once symptoms are improving and tolerable, typically within 48 to 72 hours. Do NOT hold students out of school until they are totally "symptom-free." Educate student/athlete and family on the typical course of concussion and the need for rest with gradual re-integration of "activity" (school, home and social stimulation, light cardio exercise under the supervision of parent and/or physical therapist). Monitor that symptoms are improving throughout Week 1 – not worsening in the first 48 to 72 hours. 	<ul style="list-style-type: none"> Continue to consult with school and family teams. Follow-up medical check including: comprehensive history, neurologic exam, detailed assessment of mental status, cognitive function, gait and balance. 	<ul style="list-style-type: none"> Continue to consult with school and home teams. Consider referral to a Specialty Concussion Clinic if symptoms are especially problematic or long. It is best practice that a medical professional be involved in the management of each and every concussion, not just those covered by legislation.

*Family should sign a Release of Information so that School Team and Medical Team can communicate with each other as soon as possible.

» Don't be alarmed by symptoms – symptoms are the hallmark of concussion. The goal is to watch for a slow and steady improvement in symptoms over weeks. **It is typical for symptoms to be present for up to three to four weeks.** If symptoms persist at Week 4+, see SPECIAL CONSIDERATIONS.

» Once a concussion has been diagnosed:



Jake Snakenberg

April 19, 1990 –
September 19, 2004

In the Fall of 2004, Jake Snakenberg was a freshman football player at Grandview High School. He likely sustained a concussion in a game the week prior, however, he did not fully understand that he had experienced a concussion, and he did not report his symptoms to anyone. One week later, Jake took a typical hit in a game, collapsed on the field and never regained consciousness. Jake passed away from “Second Impact Syndrome” on September 19, 2004.

“Education is key. Concussions are not a one size fits all. Keen observation is necessitated by all members involved (concussion sufferer, healthcare providers, caretakers, coaches, teachers, etc) to recognize compromised functions, aggravating factors, effective strategies in recovery, and tolerance thresholds. Once the above parameters are established, all in the multidisciplinary team performs their part to execute the best approach for that individual while maintaining a strong coordination throughout the process. Timely execution of these critical steps can mean the difference between complete recovery versus partial recovery with longstanding repercussions.” –Christopher Danduran, DC, DACNB, FACFN, CNS and Clinical Director of NeuroLife Center in Fargo, ND

**STEP ONE: REMOVE student/athlete from all physical activities.
REDUCE school demands and home/social stimulation.**

The biggest concern with concussions in children/teens is the risk of injuring the brain again before recovery. This is called “Second Impact Syndrome,” and it is thought to occur when an already injured brain takes another hit resulting in possible massive swelling, brain damage and/or death⁵. The concussed brain is in a vulnerable state, and even a minor impact can result in a much more severe injury with risk of permanent brain damage, or rarely, even death. Therefore, once a concussion has been identified, it is critical to REMOVE a student/athlete from ALL physical activity, including PE classes, dance, active recess, recreational and club sports until medically cleared.

Secondly, **while the brain is still recovering**, all school demands and home/social stimulation should be reasonably REDUCED (not eliminated completely) and then slowly brought back up over 4 weeks. Reducing demands on the brain will promote REST and will help recovery.

FT	Family Team	<p>REMOVE student/athlete from all physical activity immediately, including play at home (i.e. playground, bikes, skateboards), recreational, and/or club sports.</p> <p>REDUCE or limit home/social stimulation, including texting. Do not totally restrict electronics and social activities; make a reasonable home plan.</p> <p>Encourage REST for the first few days followed by a gradual re-introduction of cognitive, social and home activities.</p>
ST/P	School Team Physical	<p>REMOVE student/athlete from all physical activity immediately.</p> <p>Support REDUCTION of school demands and home/social stimulation.</p> <p>Provide encouragement to REST and take the needed time to heal.</p>
ST/A	School Team Academic	<p>REMOVE student/athlete from all physical activity at school, including PE, recess, dance class.</p> <p>REDUCE or limit school demands. Do not totally restrict academic expectations. (See ADJUST/ACCOMMODATE for Educators on pages 9-10).</p> <p>Encourage “brain REST” breaks at school.</p>
MT	Medical Team	<p>REMOVE student/athlete from all physical activity immediately.</p> <p>RULE-OUT more serious medical issues including severe traumatic brain injury.</p> <p>Consider risk factors – evaluate for concussion complications.</p> <p>Support REDUCTION of school demands and home/social stimulation.</p> <p>Encourage REST for the first few days followed by a gradual re-introduction of cognitive, social and home activities.</p>

STEP TWO: EDUCATE all teams that symptoms tell the story of the recovery of the concussion.

After a concussion, the brain cells are temporarily inefficient. A helpful way for students, parents and teachers to think of a concussion is as an “energy crisis”; not as something scary like a bruise or a bleed. Here are two energy management scripts to use with your kids children/teens/students:

“When you have a concussion, you are like an iPhone 4, you are not an iPhone X. You are not broken, you are just not holding a charge long enough.”

“When you have a concussion, you are like a car with a small gas tank. You can get out of the garage (go to school, socialize with friends) but you need to ‘do, then fuel.’ The symptoms function like an indicator light on the car’s dashboard. When they ‘flare’, they are simply a signal of how well you have been managing your energy levels.”

Symptoms become the barometer of the concussion. If symptoms may be present for up to 4 weeks (albeit hopefully decreasing daily/weekly), it is our duty to teach our children how to “pace their energy so they can control their symptoms” – that is the best way for them to stay engaged in school and life while holding symptoms at bay. Learning to manage symptoms is an active approach to rehabilitation! Doing cognitive and home activities in smaller amounts followed by eye/brain/water intake breaks (5 to 10 minutes)... “do, then fuel”... is how the school and home plan can be rehabilitative and not restrictive. It is unreasonable to ask a child/teen to never text or watch TV over 4 weeks. It is unreasonable to ask a teacher to never ask a student to read or look at a computer or complete some in-class schoolwork or homework over 4 weeks. If we want our children/teens/students to be engaged in their own recovery, we have to keep them reasonably engaged in their own lives – socially, academically and at home – while we are waiting for the concussion to heal.



Medical Note from Katherine M. Klipfel, Ph.D., L.P.
 Pediatric Neuropsychologist
 Department of Neuropsychology
 Sanford Brain & Spine Center, Fargo, ND 58103

We expect children and teenagers to be able to successfully reintegrate into school, activities, and relationships most effectively with appropriate accommodations. While we expect concussion to naturally improve – and relatively quickly – for most children, a balance between reintegration and appropriate accommodations is critical to help children recover and manage any related stressors. This is most effective if appropriate education and plans are implemented right away and across settings. Certainly, it is not a one size fits all model, though an evidence-based manual will be a wonderful strategy to help lay the groundwork for improved outcomes following head injury in the state of North Dakota.

PHYSICAL
 How a Person Feels Physically

- | | |
|--------------------------|----------------------|
| Headache/Pressure | Nausea |
| Blurred vision | Vomiting |
| Dizziness | Numbness/Tingling |
| Poor balance | Sensitivity to light |
| Ringing in ears | Sensitivity to noise |
| Seeing “stars” | Disorientation |
| Vacant stare/Glassy eyed | Neck Pain |

COGNITIVE
 How a Person Thinks

- Feel in a “fog”
- Feel “slowed down”
- Difficulty remembering
- Difficulty concentrating/easily distracted
- Slowed speech
- Easily confused

EMOTIONAL
 How a Person Feels Emotionally

- | | |
|--------------------------|--------------------|
| Inappropriate emotions | Irritability |
| Personality change | Sadness |
| Nervousness/Anxiety | Lack of motivation |
| Feeling more “emotional” | |

SLEEP/ENERGY
 How a Person Experiences Their Energy Level and/or Sleep Patterns

- | | |
|----------------------|--------------------------|
| Fatigue | Drowsiness |
| Excess sleep Trouble | Sleeping less than usual |
| falling asleep | |

IMPORTANT

All symptoms of concussion are important; however, monitoring of physical symptoms, within the first 48 to 72 hours is critical! If physical symptoms worsen, especially headache, confusion, disorientation, vomiting, difficulty awakening, it may be a sign that a more serious medical condition is developing in the brain.

SEEK IMMEDIATE MEDICAL ATTENTION!

Do not worry that your child has symptoms for 1 to 4 weeks; it is typical and natural to notice symptoms for 1 to 4 weeks. You just want to make sure you are seeing slow and steady resolution of symptoms every day. To monitor your child’s progress with symptoms, chart symptoms periodically (see TIMEFRAME on page 5) and use the Symptom Checklist (see APPENDIX). In a small percentage of cases, symptoms from a concussion can last from weeks to months. (See SPECIAL CONSIDERATIONS on page 13.)

STEP THREE: ADJUST/ACCOMMODATE for PARENTS.

AFTER YOUR CHILD HAS RECEIVED THE DIAGNOSIS OF CONCUSSION by a healthcare professional, their symptoms will determine when they should return to school. As the parent, you will likely be the one to decide when your child goes back to school, because you are the one who sees your child every morning before school. Use the chart below to help decide when it is right to send your child back to school:

STAY HOME – EARLY SLEEP
If your child’s symptoms are so severe that he/she cannot concentrate for even 10 minutes, he/she should be kept home on total bed rest – no texting, no driving, no reading, no video games, no homework, limited TV. It is unusual for this state to last beyond a few days. Consult a physician if this state lasts more than 2 days.

STAY HOME – LIGHT ACTIVITY
If your child’s symptoms are improving but he/she can still only concentrate for up to 20 minutes, he/she should be kept home – but may not need total bed rest. Your child can start light mental activity (e.g. sitting up, watching TV, light reading), as long as symptoms do not worsen. If they do, cut back the activity and build in more REST.

TRANSITION BACK TO SCHOOL

- When your child is beginning to tolerate 30 to 45 minutes of light mental activity, you can consider returning them to school. As they return to school:
- Parents should communicate with the school (school nurse, teacher, school mental health and/or counselor) when bringing the student into school for the first time after the concussion.
 - Parents and the school should decide together the level of academic adjustment needed at school depending upon:
 - ✓The severity of symptoms present
 - ✓The type of symptoms present
 - ✓The times of day when the student feels better or worse
 - The child **MUST** sit out of physical activity – gym/PE classes, highly physically active classes (dance, weight training) and physically active recess until medically cleared.
 - Consider removing child from band or music if symptoms are provoked by sound.

» GOING BACK TO SCHOOL

I am a mother of three children, two of which are very athletic and were involved in more than one school sport, until the day that our son and our daughter each received sport concussions. We met with numerous local Doctors that did not suggest any accommodations would be needed to help aide the healing of our concussed children, other than rest and to stay out of contact sports until symptoms improved. We finally traveled to Children’s Hospital Concussion Clinic and were told the importance of getting accommodations in the form of a 504 for a “return to learn” and to help heal from a concussion. After seeing the importance of having accommodations in place to heal a brain injury, including a mild concussion, I feel strongly that we need to get these accommodations into all schools and to medical personnel throughout North Dakota. It takes the student a while to advocate for himself/herself as they are used to being able to do everything, however, they may need to remind teachers of their 504 plan, as we learned that first-hand. With group effort, advocacy and faith we know that we can help the next student succeed and their family feel at ease. I now do public speaking and advocate for all those with mild Traumatic Brain Injuries (concussions). I am also working on starting a support group for Dysautonomia/POTS (a condition triggered by our daughter’s concussion) in Bismarck and our family mission is to keep educating others including schools, medical professionals, families, coaches, referees, etc. REAP is a great start to help us spread this mission across North Dakota!

Jami Benz, Bismarck

School Academic Note

As the medical profession has learned more about brain injuries and how they can impact a person’s ability to communicate, think, and perform daily tasks both short and long term, our educational settings have been better able to support students who have sustained a brain injury at the classroom level. REAP provides schools and families valuable insight and guidance on how to best assist persons with a brain injury throughout their healing process, and we are thankful to have this resource available to our school system. In the past we relied on trial and error and (hopefully) common sense when working with students who have sustained concussions or brain injuries, and now we have research-based best practices available through organizations such as REAP. As you can imagine, the end result for students has been exponentially better.” –Catherine Gillach, Assistant Superintendent of Secondary Education for Grand Forks Public Schools

**STEP THREE: ADJUST/
ACCOMMODATE for EDUCATORS.**



School Team Educators

Return to Learn (RTL)

RTL refers to a teacher’s ability to help a student with a concussion learn to “pace” levels of energy in order to maximize learning while minimally contributing to symptom flare-ups. A RTL plan is most robust when teachers, especially general education teachers, are empowered to make educational decisions for their students hourly, daily and weekly, as they see fit. While medical input may be helpful in an RTL plan, teachers need not wait for medical input/“clearance”/approval to apply or remove academic adjustments, especially if medical input is not forthcoming, timely, available or relevant. RTL recommendations provided by healthcare providers are “suggestions,” not mandates. Schools may accept or reject outside RTL suggestions based upon its educational soundness, feasibility and alignment with school policy/protocol.

» Most Common “Thinking” Cognitive Problems Post-Concussion

And suggested adjustments/accommodations

Areas of concern	Suggested Accommodations for Return-to-Learn (RTL)
Fatigue, specifically Mental Fatigue	<ul style="list-style-type: none"> Schedule “strategic” rest periods. Do not wait until the student’s over-tiredness results in an emotional “meltdown.” Proactively adjust the schedule to incorporate a 15-20 minute rest period 1X mid-morning and 1X mid-afternoon, as needed. Allow for “PACING” – 5 to 10 minute eye/brain/water breaks in the classroom after periods of mental exertion. Do not consider “quiet reading” as rest for all students. Consider letting the student have sunglasses, headphones, preferential seating, quiet work space, passing in quiet halls, etc., as needed.
Difficulty concentrating	<ul style="list-style-type: none"> REDUCE the cognitive load—it is a fact that smaller amounts of learning will take place during the recovery. Since learning during recovery is compromised, the academic team must decide: What is the most important concept for the student to learn during this recovery? Be careful not to tax the student cognitively by demanding that all learning continue at the rate prior to the concussion.
Slowed processing speed	<ul style="list-style-type: none"> Provide extra time for tests and projects and/or shorten tasks. Assess whether the student has large tests or projects due during the 4-week recovery period and remove or adjust due dates. Provide a peer notetaker or copies of teacher’s notes during recovery. Grade work completed—do not penalize for work not done.
Difficulty with working memory	<ul style="list-style-type: none"> Initially exempt the student from routine work/tests. Since memory during recovery is limited, the academic team must decide: What are the most important concepts for the student to know? Work toward comprehension of a smaller amount of material versus rote memorization.
Difficulty converting new learning into memory	<ul style="list-style-type: none"> Allow student to “audit” the material during this time. REMOVE “busy” work that is not essential for comprehension. Making the student accountable for all of the work missed during the recovery period (4 weeks) places undue cognitive and emotional strain on him/her and may hamper recovery. Ease student back into full academic/cognitive load.
Emotional symptoms	<ul style="list-style-type: none"> Be mindful of emotional symptoms throughout! Students are often scared, overloaded, frustrated, irritable, angry and depressed as a result of concussion. They respond well to support and reassurance that what they are feeling is often the typical course of recovery. Watch for secondary symptoms of depression – usually from social isolation. Watch for secondary symptoms of anxiety – usually from concerns over make-up work or slipping grades. New research informs us of the impact a concussion can have on emotional well-being. Supportive psychological support, education, cognitive-behavioral strategies and stress reduction are all suggested for psychological rehabilitation.

STEP THREE: ADJUST/ACCOMMODATE for EDUCATORS (continued)

Typically, **students' symptoms only require 2 to 3 days of absence** from school. If more than 3 days are missed, call a meeting with parents and seek a medical explanation.

New research shows that students who rested for 1 to 2 days followed by a gradual return to activities (school, socializing) had fewer reported symptoms than students who took 5 days of strict rest.⁷

More rest has not been proven to be the fastest, easiest way to recover from a concussion! A reasonable amount of rest, followed by a measured increase in home and school activities (activities that do not overly exacerbate symptoms) seems to be the formula for better concussion recovery.

PHYSICAL:

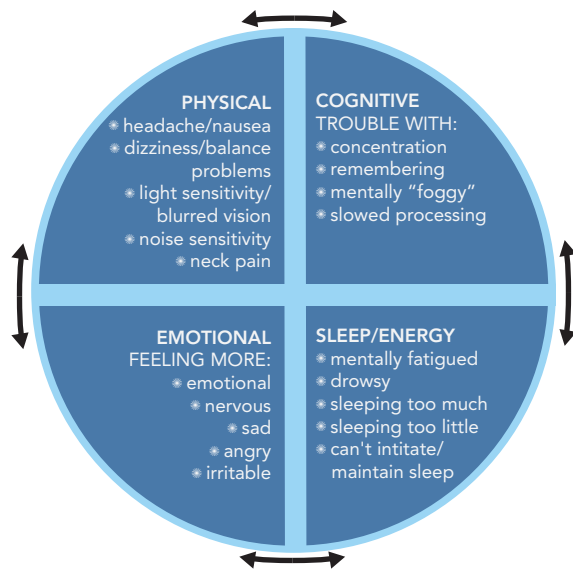
- "Strategic Rest" scheduled 15 to 20 minute breaks in clinic/quiet space (mid-morning; mid-afternoon, and/or as needed)
- Sunglasses (inside and outside)
- Quiet room/environment, quiet lunch, quiet recess
- More frequent breaks in classroom and/or in clinic
- Allow quiet passing in halls
- REMOVE from PE, physical recess, & dance classes without penalty
- Sit out of music, orchestra and computer classes if symptoms are provoked

EMOTIONAL:

- Allow student to have "signal" to leave room
- Help staff understand that mental fatigue can manifest in "emotional meltdowns"
- 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

Symptom Wheel

Suggested Academic Adjustments



Read "Return to Learning: Going Back to School Following a Concussion" at nasonline.org/publications/cq/40/6/return-to-learning.aspx⁸

COGNITIVE:

- REDUCE workload in the classroom/homework
- REMOVE non-essential work
- REDUCE repetition of work (i.e. only do even problems, go for quality not quantity)
- Adjust "due" dates; allow for extra time
- Allow student 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

SLEEP/ENERGY:

- Allow for "Pacing" – 5 to 10 minute eye/brain/water rest breaks in the classroom (i.e. eyes closed, head on desk) after periods of mental exertion
- Allow student to start school later in the day
- Allow student to leave school early
- Alternate "mental challenge" with "mental rest"

Message to Educators

An inefficiently fueled brain leads primarily to:

- mental fatigue
- slowed processing speed
- difficulty learning new material (aka problems with short-term memory)

How do you deal with mental fatigue in your classroom already (perhaps due to mono or family stress)? You might offer more rest breaks or some TLC.

How do you deal with a student's inability to get through in-class work due to slowed processing speed (perhaps due to ADHD)? If you teach math, you might assign every other problem. If you teach social studies, you might have the student listen with supplemental buddy notes.

What do you do if a student with seizures has been physically or cognitively unavailable to learn and now is scheduled to take a test? You might offer them the option of an oral presentation.

You see, the key to supporting a student with a concussion is **"differentiated instruction,"** a tool already within your repertoire! If you know how to help students with mental fatigue, slowed processing speed and short-term memory problems, you know how to support students with a concussion.

The best academic adjustment you can offer a student with a concussion is: REMOVAL of non-essential in-class work/homework and a REDUCTION of semi-essential in-class work/homework. Extension or postponement of work is less helpful to a student with a concussion unless it is used in combination with removal and reduction of in-class work/homework.

Adapted from GetSchooledOnConcussions.com⁹

» How do I get back to my sport?

A.K.A. How do I get “cleared” from this concussion?

While 70% of concussions will resolve in 4 weeks, a healthcare professional, whether in the Emergency Department or in a clinic, cannot predict the length of time or the course of recovery from a concussion. In fact, a healthcare professional should never tell a family that a concussion will resolve in X number of days, because every concussion is different and each recovery time period is unique. The best way to assess when a student/athlete is ready to start the step-wise process of “Returning-to-Sport” is to ask these questions:

» Is the student/athlete 100% symptom-free at home?

- Use the Symptom Checklist every few days. All symptoms should be at “0” on the checklist or at least back to the perceived “baseline” symptom level.
- Look at what the student/athlete is doing. At home he/she should be acting the same way as before the concussion, doing chores, interacting normally with friends and family.
- Symptoms should not return when the student/athlete is exposed to the loud, busy environment of home/social, mall or restaurants.

» Is the student 100% symptom-free at school?

- Your student/athlete should be handling school work at the same level as before the concussion.
- Use the Teacher Feedback Form (APPENDIX) to see what teachers are noticing.
- Watch your child/teen doing homework; he/she should be able to complete homework as efficiently as before the concussion.
- In-school test scores should be back to where they were pre-concussion.
- School workload should be back to where it was pre-concussion.
- Symptoms should not return when the student/athlete is exposed to the loud, busy environment of school.

» If the school or healthcare professional has used neurocognitive testing, are scores back to baseline or at least reflect normative average and/or baseline functioning?

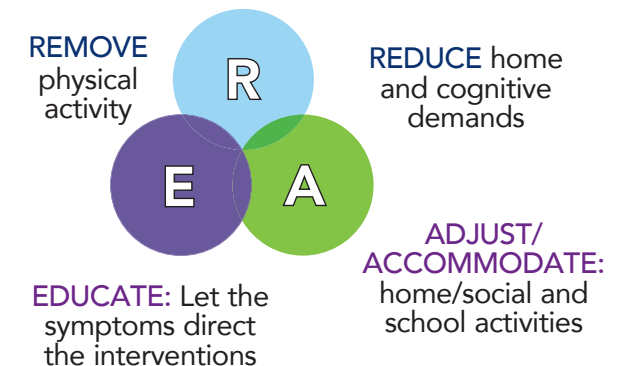
» If an athletic trainer (AT) or physical therapist (PT) is involved with the concussion, does the AT or PT feel that the student/athlete has reached his/her objective goals?

- Ask AT for feedback and/or serial administrations of the Symptom Checklist.

» Is the student off all medications used to treat the concussion?

- This includes over-the-counter medications such as ibuprofen, naproxen and acetaminophen, which may have been used to treat headache or pain.

If the answer to any of the questions is “NO,” stay the course with management and continue to repeat:



... for however long it takes for the brain cells to heal!

The true test of recovery is to notice a steady decrease in symptoms while noticing a steady increase in the ability to handle more rigorous home social and school demands (Return to Activity).

PARENTS and TEACHERS try to add in more home/social and school activities and test out those brain cells!

Once the answers to the questions above are all “YES,” turn the page to the PACE page to see what to do next!

STEP FOUR: PACE

FAMILY TEAM Is the student/athlete 100% back to pre-concussion functioning?

SCHOOL TEAM/ACADEMIC Is the student/athlete 100% back to pre-concussion academic functioning

WHEN ALL FOUR TEAMS AGREE
 that the student/athlete is 100% recovered, the MEDICAL TEAM can then approve the starting of the Graduated RTS steps. The introduction of physical activity (in the steps outlined in order below) is the last test of the brain cells to make sure they are healed and that they do not "flare" symptoms. This is the final and formal step toward "clearance" and the safest way to guard against a more serious injury.

MEDICAL TEAM approves the start of RTS steps

SCHOOL TEAM/PHYSICAL Often the AT at the school takes the athlete through the RTS steps.
 If there is no AT available, the MEDICAL TEAM should teach the FAMILY TEAM to administer and supervise the RTS steps.

Graduated Return-to-Sport (RTS) Strategy Recommended by The 2016 Berlin Consensus Statement on Concussion in Sport³

Stage	Aim	Activity	Goal of each step
1	Symptom-limited activity	Daily activities that do not provoke symptoms	Gradual reintroduction of work/school activities
2	Light aerobic exercise	Walking or stationary cycling at slow to medium pace. No resistance training	Increase heart rate
3	Sport-specific exercise	Running or skating drills. No head impact activities	Add movement
4	Non-contact training drills	Harder training drills, e.g. passing drills. May start progressive resistance training	Exercise, coordination and increased thinking
5	Full contact practice	Following medical clearance, participate in normal training activities	Restore confidence and assess functional skills by coaching staff
6	Return to sport	Normal game play	

NOTE: An initial period of 24 – 48 hours of both relative physical rest and cognitive rest is recommended before beginning the RTS progression. There should be at least 24 hours (or longer) for each step of the progression. If any symptoms worsen during exercise, the athlete should go back to the previous step. Resistance training should be added only in the later stages (stage 3 or 4 at the earliest). If symptoms are persistent (e.g. more than 10 – 14 days in adults or more than 1 month in children), the athlete should be referred to a healthcare professional who is an expert in the management of concussion.

International Consensus Statements have outlined this as a safe practice for professional athletes when returning to an organized sport; these steps might ideally also be applied as best practice when returning any person with a concussion back to a recreational sport/activity.

Rehabilitation Note

The 5th Consensus Statement suggests: 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 active while staying below their cognitive and physical symptom-exacerbation thresholds (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. The exact amount and duration of rest is not yet well defined in the literature and requires further study.³

PACE

» Special Considerations

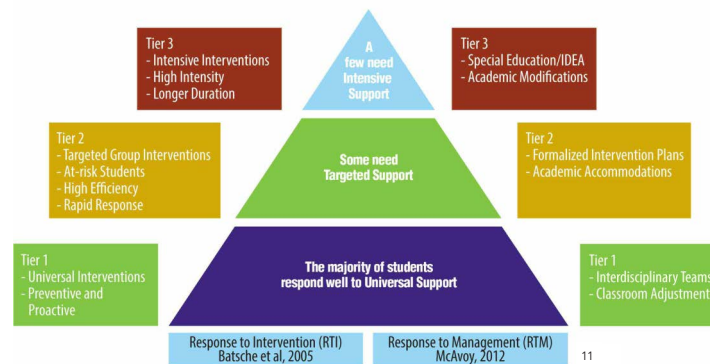
We now know, 70% of concussions will resolve within 4 weeks.

However, there remains the 30% of student/athletes who have on-going physical, cognitive, emotional or sleep/energy symptoms well beyond the 4 week mark. In those cases, the parent and medical professionals are advised to look to the school system for existing educational initiatives available to all students. A number of educational initiatives (Response to Intervention RTI; Multi-Tier System of Support MTSS) allow for ascending levels of supports for any student with a medical, psychological, behavioral or social condition impacting learning. Concussion, in theory, is a short-term, temporary condition that sometimes needs higher levels of educational support when it does not resolve in a timely fashion. Ascending levels of support suggest that good teaching and reasonable academic “adjustments” in the general education classroom are helpful to any and all students who struggle in an academic setting. Ascending levels of support are applicable to concussion. We have called this “Response to Management (RTM).”

With ascending levels of support, we maximize the student/athlete’s recovery by focusing on good academic “adjustments” in the general education classroom.

A smaller percentage of students who struggle beyond the general education classroom may need a small amount of “targeted intervention” called academic “accommodation.” Academic “accommodations” may be provided via a Health Plan, a Learning Plan, a 504 Plan.¹⁰ It is still hoped that the accommodations for learning, behavior or concussions are temporary and amenable to intervention but may take months (instead of weeks) for progress to show. Lastly, in the rare event that a permanent “disability” is responsible for the educational struggle, the student may be assessed and staffed into special education services (IDEA) and provided an IEP (Individualized Education Program). This would constitute an extremely small number of students with a concussion. The interdisciplinary teams need to continue to work together with the student/athlete with protracted recovery. Parents and medical professionals need to seek medical explanation and treatment for slowed recovery; educators need to continue to

Concussion Management Guidelines



provide the appropriate supports and the school physical team needs to continue to keep the student/athlete out of physical play.

Words Matter: Use these terms intentionally: Adjustments/ Accommodations/Modifications

DAYS TO WEEKS: Academic Adjustments
Informal, flexible day-to-day adjustments in the general education classroom for the first 3 to 4 weeks of a concussion. Can be lifted easily when no longer needed.

WEEKS TO MONTHS: Academic Accommodations
Slightly longer accommodations to the environment/ learning to account for a longer than 4+ week recovery. Helps with grading, helps justify school supports for a longer time.

MONTHS TO YEARS: Academic Modifications
Actual changes to the curriculum/placement/ instruction.

Medical Note

While concussions are associated with heterogeneous clinical profiles, subtle persistent deficits in visual function are often not fully recognized, tested or treated. Yet by some estimates up to 90 percent of mTBI patients experience visual symptoms that may include oculomotor and accommodative dysfunction, binocular vision deficits, perceptual and attentional problems, visual memory deficits, visuomotor impairment and visual information processing problems. Often these deficits do not resolve on their own and affect all aspects of the child’s life including academic and athletic performance, socialization and the overall quality of life. These deficits may also prevent the child from fully benefiting from available rehabilitation services. At the same time specific optometric vision therapy has been very effective in treating these deficits by stimulating neuroplasticity in the brain. It is critical for educators, coaches and rehabilitation service providers to appreciate the full scope of issues related to concussion and provide continuity of care to the affected student. REAP may become an excellent resource in promoting this awareness and connecting educators and providers into a community network”. –Dmitri Poltavski, Ph.D., Advanced Neuro-Vision Systems, LLC

Resources

Centers for Disease Control (CDC)	CDC.gov	1-800-CDC-INFO
North Dakota Brain Injury Network	ndbin.org	1-855-866-1884
ND High School Athletics Association	ndhsaa.com	701-845-3953
ND Department of Public Instruction	nd.gov/dpi	701-328-2260
ND Athletic Trainers Association	ndata.org	
National Federation of State High School Associations	nfhs.org	
Get Schooled On Concussions A website FOR Educators, BY educators	GetSchooledOnConcussions.com	

Please Note:

This publication is not a substitute for seeking medical care.

REAP is available for customization in your state.

All questions or comments and requests for in-services/trainings can be directed to:

- Karen McAvoy, PsyD
REAPconcussion.com
Karen@GetSchooledOnConcussions.com

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- Ciera Lund and the Lund family

The 2013 Colorado version of the REAP publication is available in Spanish upon request.



» Symptom Checklist

Name: _____ Assessment Date: _____

Date of Injury: _____ Time of Injury 2-3 Hrs 24 Hrs 48 Hrs 72 Hrs Daily Weekly

Pathways of Concern	Symptoms		Severity Rating						
				Mild	Mild	Moderate	Moderate	Severe	Severe
A	I feel like I'm going to faint	0	1	2	3	4	5	6	
V	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	
O	Things look blurry	0	1	2	3	4	5	6	
	I see double	0	1	2	3	4	5	6	
H	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 me	0	1	2	3	4	5	6	
	The light bothers my eyes	0	1	2	3	4	5	6	
C	I have pressure in my head	0	1	2	3	4	5	6	
	I feel numbness and tingling	0	1	2	3	4	5	6	
N	I have neck pain	0	1	2	3	4	5	6	
S/E	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	
Cog	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 my thinking is "foggy"	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		
E	I feel more emotional	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	

Other: _____

Pathways of concern: A=Autonomic, V=Vestibular, O=Oculomotor, H=Headache (Migraine & Non-Migraine), C=Cervicogenic, N=Neck Strain, S/E=Sleep/Energy, Cog=Cognitive, E=Emotional

Regular symptom progress monitoring is recommended as best practice.

» Teacher Feedback Form

Date _____

Student's Name _____

Date of Concussion _____

Student: you have been diagnosed with a concussion. It is your responsibility to gather data from your teachers before you return to the doctor for a follow-up visit. A day or two before your next appointment, go around to all of your teachers (especially the CORE classes) and ask them to fill in the boxes below based upon how you are currently functioning in their class(es).

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, and emotional or sleep/energy symptoms in your classroom(s). If you have any concerns, please state them below.

1. Your name 2. Class taught	Is the student still receiving any academic adjustments in your class? If so, what?	Have you noticed, or has the student reported, any concussion symptoms lately? (e.g. complaints of headaches,dizziness, difficulty concentrating or remembering, more irritable, fatigued than usual etc.?) If yes, please explain.	Do you believe this student is performing at his/her pre-concussion learning level?
			<input type="checkbox"/> Yes <input type="checkbox"/> No Date: Signature:
			<input type="checkbox"/> Yes <input type="checkbox"/> No Date: Signature:
			<input type="checkbox"/> Yes <input type="checkbox"/> No Date: Signature:
			<input type="checkbox"/> Yes <input type="checkbox"/> No Date: Signature:

Regular academic progress monitoring is recommended as best practice.



NORTH DAKOTA CENTURY CODE
CHAPTER 15.1-18.2-04
Student athletics – Concussion management
program – Requirements



1. Each school district and nonpublic school that sponsors or sanctions any athletic activity in this state and requires a participating student to regularly practice or train, and compete, is subject to the terms of a concussion management program.
2. The concussion management program must set forth in clear and readily comprehensible language the signs and symptoms of a concussion.
3. a. The concussion management program must require that student be removed from practice, training, or competition if:
 - 1) The student reports any sign or symptom of a concussion, as set forth in accordance with this section;
 - 2) The student exhibits any sign or symptom of a concussion, as set forth in accordance with this section; or
 - 3) A licensed, registered, or certified health care provider whose scope of practice includes the recognition of concussion signs and symptoms determines, after observing the student, that the student may have a concussion.b. The duty to remove a student under the conditions set forth in this subsection extends to:
 - i. Each official;
 - ii. The coach of a student; and
 - iii. Any other individual designated by the school district or nonpublic school as having direct responsibility for the student during practice, training, or competition.
4. The concussion management program must require that any student who is removed in accordance with subsection 3 must be evaluated as soon as practicable by a licensed health care provider who is acting within the provider's scope of practice and trained in the evaluation and management of concussion, as determined by the provider's licensing board.
5. a. A student who is evaluated in accordance with subsection 4 and believed to have suffered a concussion may not be allowed to return to practice, training, or competition until the student's return is authorized by a licensed health care provider who meets the criteria set forth in subsection 4.
 - b. The authorization required by this subsection must be:
 - 1) In writing;
 - 2) Presented or forwarded to the individual designated by the student's school district or nonpublic school for receipt of such authorizations; and
 - 3) Retained by the student's school district or school for a period of seven years after conclusion of the student's enrollment.
 - c. Any health care provider who signs an authorization in accordance with this section is acknowledging that the provider is acting within the provider's scope of practice and is trained in the evaluation and management of concussion, as determined by the provider's licensing board.
6. The concussion management program must require that each official, coach, and individual designated by the school district or nonpublic school as having direct responsibility for the student during practice, training, or competition receive biennial training regarding the nature and risk of concussion.
7. The student's school district or nonpublic school shall ensure that before a student is allowed to participate in the athletic activity described in subsection 1, the student and the student's parent shall document that they have viewed information regarding concussions incurred by students participating in athletic activities. The required information must be provided by the student's school district or nonpublic school and must be made available in printed form or in a verifiable electronic format.
8. This section does not create any liability for, or create a cause of action against:
 - a. A school district, its officers, or its employees;
 - b. A nonpublic school, its officers, or its employees; or
 - c. An official.
9. A school district or a nonpublic school may contract for and accept gifts, grants, and donations from any public or nonpublic source, in order to meet the requirements of this section.
10. For the purposes of this section, "official" means an umpire, a referee, a judge, or any other individual formally officiating at an athletic event.



GetSchooledOnConcussions.com

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Visit us at www.ndbin.org



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Athletic Trainers Association

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Advanced Neuro-Vision Systems

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