



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 (2018)!

The 3rd REAP Advisory Team is pleased to provide this updated REAP concussion management program to you and your community. Developed by Dr. Karen McAvoy for use in Colorado, and now utilized across the country, the REAP approach offers a *roadmap* for coordination and communication between the four important groups of adults that surround a child after concussion: Parents/Guardians; Medical professionals; Educators; and Athletic staff. Thus, this *roadmap* provides on ramps and off ramps for School Nurses, Coaches, Athletic Trainers, Doctors, Teachers, Principals, School Administrators and more.

REAP is a guide through the "one-of-a-kind" concussion that each "one-of-a-kind" student may encounter. It is also a guide to best weave together the unique relationships, roles, expertise, and resources around each student to support their health, their academics, and their families as they recover. REAP has a strong school focus BECAUSE this is where children recover from concussion for such a large portion of their day.

It has always been REAP's commitment to incorporate both the most up to date international consensus guidelines with the most practical school-tested suggestions. As such, REAP was selected by the Iowa Concussion Consortium and endorsed by the Iowa Department of Public Health and Iowa Departments of Education as Iowa's first protocol for support in the areas of post concussive "return to play" and "return to learn". This updated REAP version is evidence that as the research and best practices around concussion and recovery change, so too will this guide.

Iowa is happy to be using REAP as our "go-to" guide in directing statewide concussion management. We know that REAP can help your state as well.

Geoffrey M. Lauer, MA
Chief Executive Officer
Brain Injury Alliance of Iowa

REAP is authored by: Karen McAvoy, PsyD

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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.

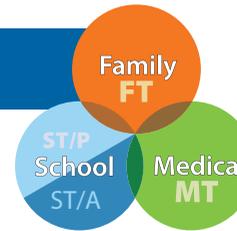


The benefits of good concussion management spelled out in REAP are known throughout communities in Colorado, nationally and internationally. REAP has been customized and personalized for various states and continues to be the "go-to" guide from the emergency department to school district to the office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

Download a digital version of this publication at REAPconcussion.com

Endorsed by:





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 Danny Mistry,
MD, ATC

An Interdisciplinary Team approach and a commitment to excellence are imperative. Potential complications can be avoided by strict adherence to the standard of care –which is simple, paying attention to detail, communication and collaboration. All members of the Interdisciplinary Team should strive to be on one-page, which empowers and helps facilitate management. Education for all members of the Interdisciplinary Team (healthcare providers, students, coaches, parents, teachers, and support staff) has significant benefits in the thorough care and enduring recovery of the patient with a concussion.

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:

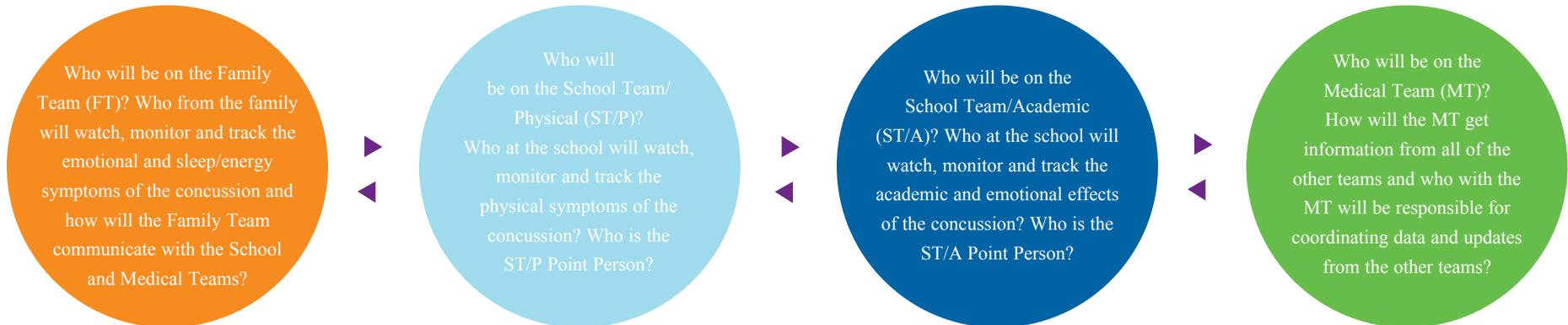
Return to School is defined as the process of the student physically walking back into a school setting. The decision to send a child to school on any given day is directed by the parent and is dependent upon the student's ability to manage symptoms well enough to be physically and cognitively present 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



TIMEFRAME

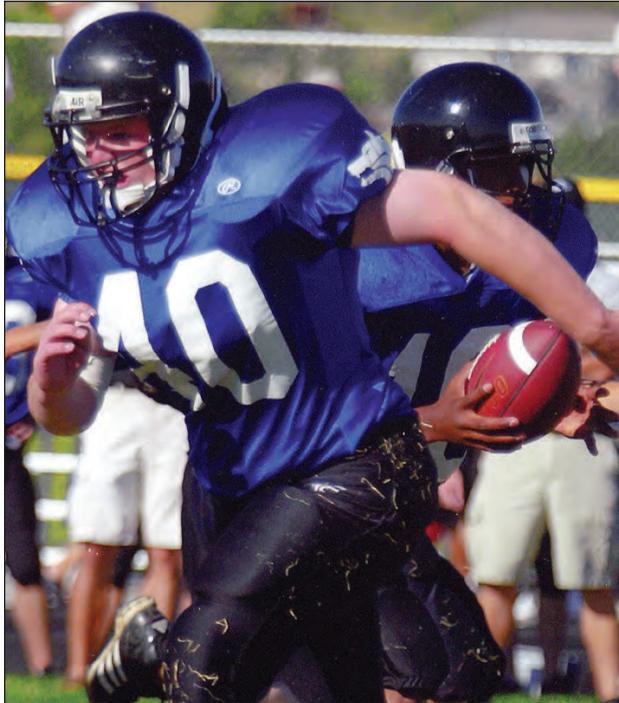
» REAP suggests the following timeframe:

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.

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

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.



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	

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.)

**Medical Note from
Danny G. Thomas MD, MPH**

Studies have shown there is no benefit in excessive rest. In fact excessive rest has been associated with worse symptoms and longer recovery. Because of the social and emotional importance of school, it is beneficial to help students gradually return to their normal routine. The general advice to guide activity in the first week is “push to, not through, symptoms.” Tolerating more and more academic and physical activity without worsening symptoms are signs of a healthy recovery.

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!

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

Ciera was 15 years old when she suffered a concussion while playing basketball. Her symptoms of passing out, constant headaches and fatigue plagued her for the remainder of her freshman year. A few accommodations helped Ciera successfully complete the school year.

“It really helped me when my teachers had class notes already printed out. That way I could just highlight what the teacher was emphasizing and focus on the concept rather than trying to take notes. Since having a brain injury, I don’t really see words on the board, I just see letters. Therefore, having the notes beforehand takes some of the frustration off of me and I am able to concentrate and retain what is being taught in class. Being able to rest in the middle of the day is also very important for me. I become very fatigued after a morning of my rigorous classes, so my counselors have helped me adjust my schedule which allows me some down time so I can keep going through my day. Lastly, taking tests in a different place such as the conference room or teacher’s office has helped a great deal.”

CIERA LUND

Medical Note

All 50 states and the District of Columbia have legislation requiring “medical clearance” for Return to Sport, however, there is no “medical clearance” or legislation for Return to School. While medical input may be helpful when returning a student to school, parents and schools need not wait for medical input/“clearance”/approval if it is not forthcoming, timely or available. According to the American Academy of Pediatrics Clinical Report on Returning to Learning Following a Concussion, students should return to school when symptoms are “tolerable, short-lived and amenable to rest and intervention.”⁶ Generally schools are able to support students with supplemental academic adjustments, and it is not necessary to hold students out of school until they are 100% symptom-free.

**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:

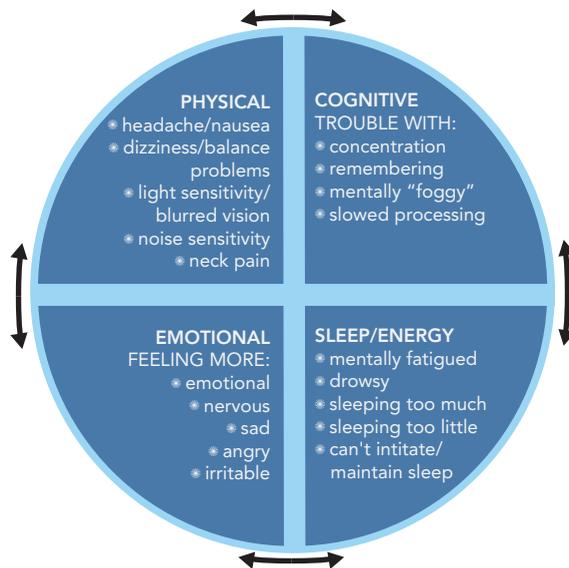
- "Strategic Rest" scheduled 15 to 20 minute breaks in clinic/quiet space (mid-morning; mid-afternoon, and/or as needed)
- Sunglasses (inside and outside)
- Quiet room/environment, quiet lunch, quiet recess
- More frequent breaks in classroom and/or in clinic
- Allow quiet passing in halls
- REMOVE from 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

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?

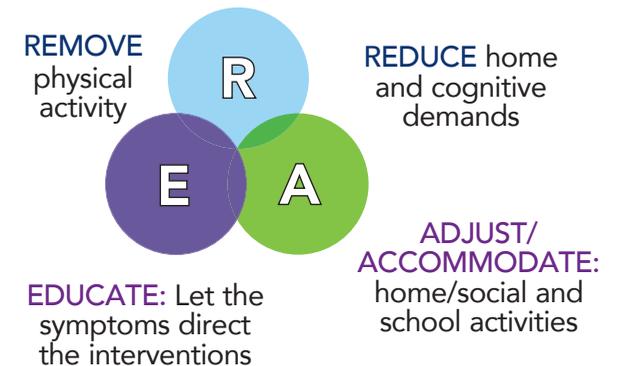
» If an athletic trainer (AT) or physical therapist (PT) is involved with the concussion, does the AT or PT feel that the student/athlete has reached his/her objective goals?

- 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



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

Students who have attention deficits, learning disabilities a history of migraine headaches, sleep disorders, depression or other mental health disorders may have more difficulty recovering from a concussion.

Students who have had multiple concussions, a recent prior concussion or who are getting symptomatic after less impact may be at risk for long-term complications. Research supports the fact that a person who sustains one concussion is at higher risk for sustaining a future concussion.¹²

Retirement from sport: If the burden of one concussion or each successive concussion is significant, the family, school and medical teams should discuss retirement from sport.

Resources

Centers for Disease Control (CDC)	CDC.gov	1-800-CDC-INFO
MINDSOURCE Brain Injury Network	mindsourcelcolorado.org	303-866-4173
CO Child/Adolescent Brain Injury	COkidswithbraininjury.com	
Brain Injury Alliance of Colorado (BIAC)	biacolorado.org	303-355-9969
Colorado High School Activities Association (CHSAA)	chsaa.org	303-344-5050
Colorado Department of Education (CDE)	cde.state.co.us	303-866-2879
National Association of Athletic Trainers (NATA)	nata.org journalofathletictraining.org	
National Federation of State High School Associations	nfhs.org	
Get Schooled On Concussions A website FOR Educators, BY educators	GetSchooledOnConcussions.com	

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- Kelli Jantz, Shannon Jantz, the Jantz/Snakenberg families
- Ciera Lund and the Lund family

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

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



» 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 _____

Date of Concussion _____

Student's Name _____

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.



SENATE BILL 11-040

- 1)(a) Each public and private middle school, junior high school, and high school shall require each coach of a youth athletic activity that involves interscholastic play to complete an annual concussion recognition education course.
- (a) Each private club or public recreation facility and each athletic league that sponsors youth athletic activities shall require each volunteer coach for a youth athletic activity and each coach with whom the club, facility, or league directly contracts with, formally engages, or employs who coaches a youth athletic activity to complete an annual concussion recognition education course.
- (2)(a) The concussion recognition education course required by subsection (1) of this section shall include the following:
- (I) Information on how to recognize the signs and symptoms of a concussion.
 - (II) The necessity of obtaining proper medical attention for a person suspected of having a concussion.
 - (III) Information on the nature and risk of concussions, including the danger of continuing to play after sustaining a concussion and the proper method of allowing a youth athlete who has sustained a concussion to return to athletic activity.



REMOVAL FROM PLAY FOR A "SUSPECTED" CONCUSSION

If a coach who is required to complete concussion recognition education pursuant to subsection (1) of this section suspects that a youth athlete has sustained a concussion following an observed or suspected blow to the head or body in a game, competition, or practice, the coach shall immediately remove the athlete from the game, competition, or practice. The signs and symptoms cannot be readily explained by a condition other than concussion.

RETURN TO PLAY

- (4)(a) If a youth athlete is removed from play pursuant to subsection (3) of this section and the signs and symptoms can not be readily explained by a condition other than concussion, the school coach or private or public recreational facility's designated personnel shall notify the athlete's parent or legal guardian and shall not permit the youth athlete to return to play or participate in any supervised team activities involving physical exertion, including games, competitions, or practices, until he or she is evaluated by a health care provider and receives written clearance to return to play from the health care provider. The health care provider evaluating a youth athlete suspected of having a concussion or brain injury may be a volunteer. "Health Care Provider" means:
- a Doctor of Medicine • Doctor of Osteopathic Medicine • Licensed Nurse Practitioner • Licensed Physician Assistant
 - Licensed Doctor of Psychology with training in neuropsychology or concussion evaluation and management.
- (b) Notwithstanding the provisions of paragraph (a) of this subsection (4), a doctor of chiropractic with training and specialization in concussion evaluation and management may evaluate and provide clearance to return to play for an athlete who is part of the united states Olympic training program.

After a concussed athlete has been evaluated and received clearance to return to play from a health care provider, an organization or association of which a school or school district is a member, a private or public school, a private club, a public recreation facility, or an athletic league may allow a registered athletic trainer with specific knowledge of the athlete's condition to manage the athlete's graduated return to play.

THIS IS COLORADO LAW



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Jake Snakenberg Fund

Dedicated to the Memory
of Jake Snakenberg

April 19, 1990 – September 19, 2004

In the fall of 2004, Jake Snakenberg passed away from "Second Impact Syndrome." As a result of Jake's death, with the support of Jake's family and a team of dedicated health professionals, REAP exists today. The Jake Snakenberg Fund is a program of Rocky Mountain Children's Health Foundation, working to enhance the quality of life for pediatric patients in the Rocky Mountain region. To ensure the ongoing efforts to educate coaches, teachers and parents on concussion recognition, please consider a gift to the Jake Snakenberg Fund.



Rocky Mountain Children's Health FOUNDATION

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Our Mission Statement: *To improve the quality of life for families, sick children and infants throughout our communities by providing support when and how they need it most.*



REAP is available to states for customization.
REAP has been customized for the states of:

- Colorado
- New York
- Florida
- New Jersey
- Washington
- Alabama
- Nebraska
- Iowa
- REAP has been translated into Spanish

REAP is being customized for:

- West Virginia
- Hawaii
- South Carolina
- North Carolina

Are you interested in having REAP customized for your state? Email us at info@REAPconcussion.com

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