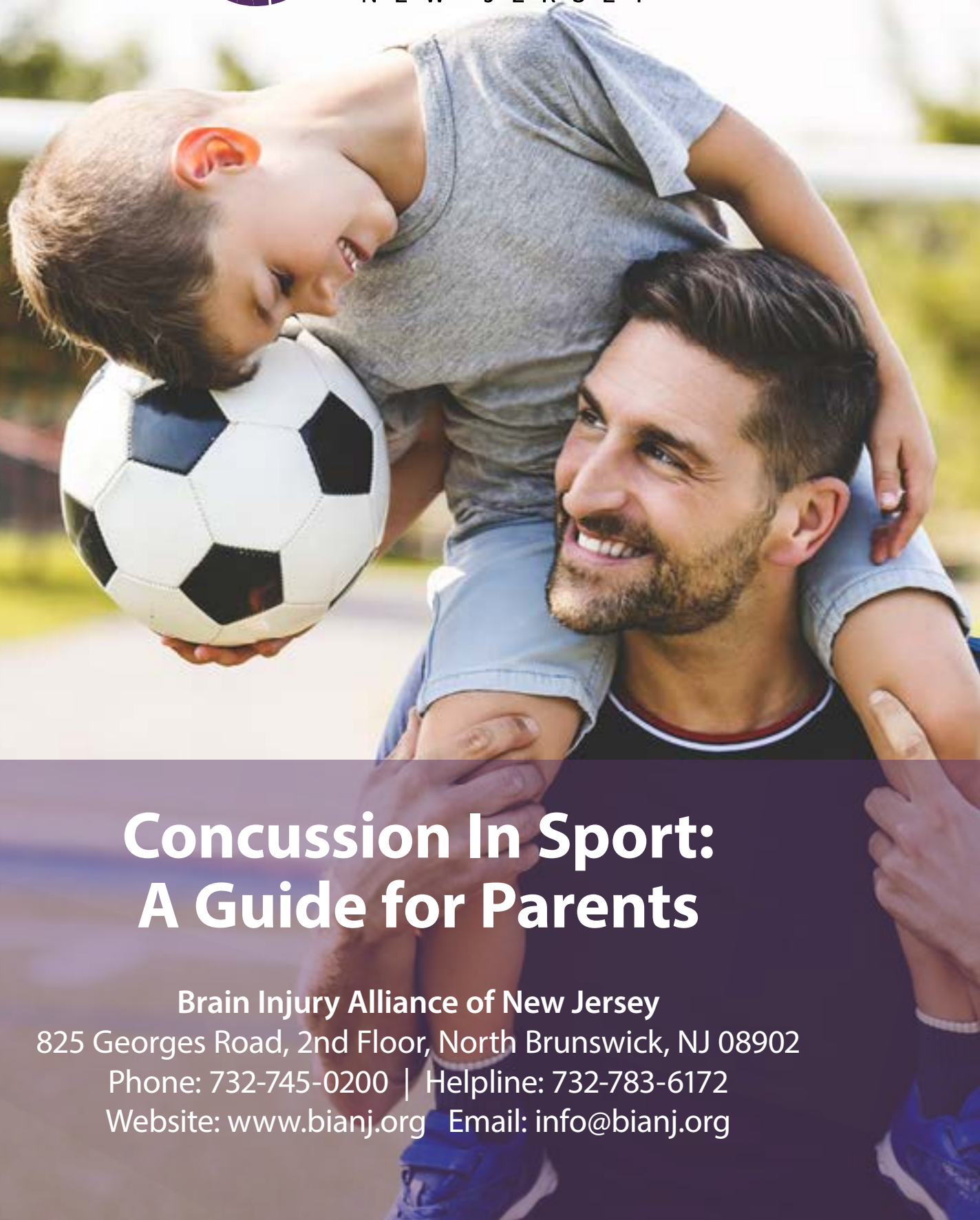




**Brain Injury
Alliance**

N E W J E R S E Y



Concussion In Sport: A Guide for Parents

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**There is
more at
stake than
just the
game.**

ADVOCACY SUPPORT EDUCATION OUTREACH PREVENTION

Introduction

Members of the Youth in Sports Concussion Steering Committee of the Brain Injury Alliance of New Jersey (BIANJ) created this guide to help families when a child is diagnosed with a concussion or when an event occurs and a concussion may be suspected. It was developed to help guide parents of children who are recovering from a concussion, to educate them about concussion, and to describe some of the complexities of concussion management.

The goal for this publication is to provide current, unbiased information about concussion in the absence of any media or marketing influence. The authors hope you find this book useful and informative.

The terms, as used in this booklet, “parents” and “families” include biological, adoptive, single parent, extended and any other familial arrangement. This resource may be valuable for anyone who cares for a child with a concussion and may need some help managing the recovery process.

Concussion affects each child differently. It is impossible to give all the answers for each situation. By familiarizing yourself with the current understanding of concussion issues, you will be better able to meet your child’s needs throughout recovery.

This guide focuses on concussion and youth sports; however, concussions happen from many different types of activities such as car crashes, falls, playground and bicycle related crashes. Concussions resulting from a sports-related event are especially challenging because children who play sports typically want to get back in the game. Children diagnosed with concussion from a non-sports related event may have less risk for a second concussion because returning to their sport is not a factor in recovery. The information in this guide provides a comprehensive overview of concussion regardless of the cause of the concussion.

This guide is not intended to be a substitute for medical advice or treatment. If you suspect a concussion, seek immediate medical care and intervention.

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The Scope of the Problem

Definition

A **concussion** is a **brain injury** induced by a bio-mechanical force, such as a blow to the head or body that changes how your brain works.

Concussions are not life-threatening, but they need to be managed properly. They can seriously affect everything from your memory and mood to your vision and balance. If your brain doesn't get the time or appropriate therapy it needs to heal after a concussion, the neurological consequences can grow far worse. Public awareness about concussion is growing, but so is confusion.

It is important to understand how and why these injuries happen, and what you can do to protect your child from them.

Incidence

Americans aged 18 or younger sustain between 1.1 million and 1.9 million sports or recreation related concussions every year, according to a study published in the journal *Pediatrics* in 2016. About half a million seek medical treatment as a result.

Diagnosed concussions in the U.S. rose 143 percent among 10 to 14 year olds and 87 percent among 15 to 19 year olds from 2007 to 2014, according to researchers at the University of California, San Francisco. That could be due both to increasing injury rates and greater awareness.

Earlier research found that sports rank second (behind only motor vehicle crashes) as the leading cause of traumatic brain injury among people aged 15 to 24.

Causes of Concussion and Prevention Strategies

Concussions can be caused by a direct blow to the head, face or neck, or from a hit to the body or fall that causes your head to move back and forth quickly. A concussion is different from a skull fracture, and its effects may not be obvious immediately. You can think of your skull as being like the shell of an egg, with your brain being the yolk – in danger of getting scrambled even if the shell doesn't crack.

Parents can:

- Have your child participate only in leagues and clubs that follow the latest guidelines for limiting head impacts by age. For instance, as of 2016, the U.S. Soccer Federation does not allow heading in programs for athletes aged 11 or younger.
- Advocate for closely-supervised and safer practices, including no-contact drills. Across sports and around the country, many organizations are moving to reduce the kinds of impacts that can cause brain injuries outside of competition. For example, in 2016, the Ivy League eliminated tackling in football practices altogether. Such measures are particularly important in high school sports, where a majority of concussions actually occur during practice, not games.
- Make sure your child always wears proper equipment, such as helmets, masks, or mouth guards. Although some evidence shows that helmets can help decrease forces to the head, thereby decreasing concussion risk, the extent of this protection is still uncertain. Therefore, helmets shouldn't make athletes feel invincible. The most important thing to remember is to wear the proper equipment for the sport; be sure it fits properly and is worn properly. This can help keep children from losing their balance, tripping, or falling, which can lead to injuries.

Children can:

Master techniques to protect their head, such as learning the best ways to take hits in lacrosse or fall in soccer. (If your child plays in a soccer league that allows heading, he or she should focus on striking the ball with good form and under control. High-velocity and surprise hits, such as heading a ball struck hard at close range or off a corner or cross kick, carry greater risk of trauma.)

MYTHS:

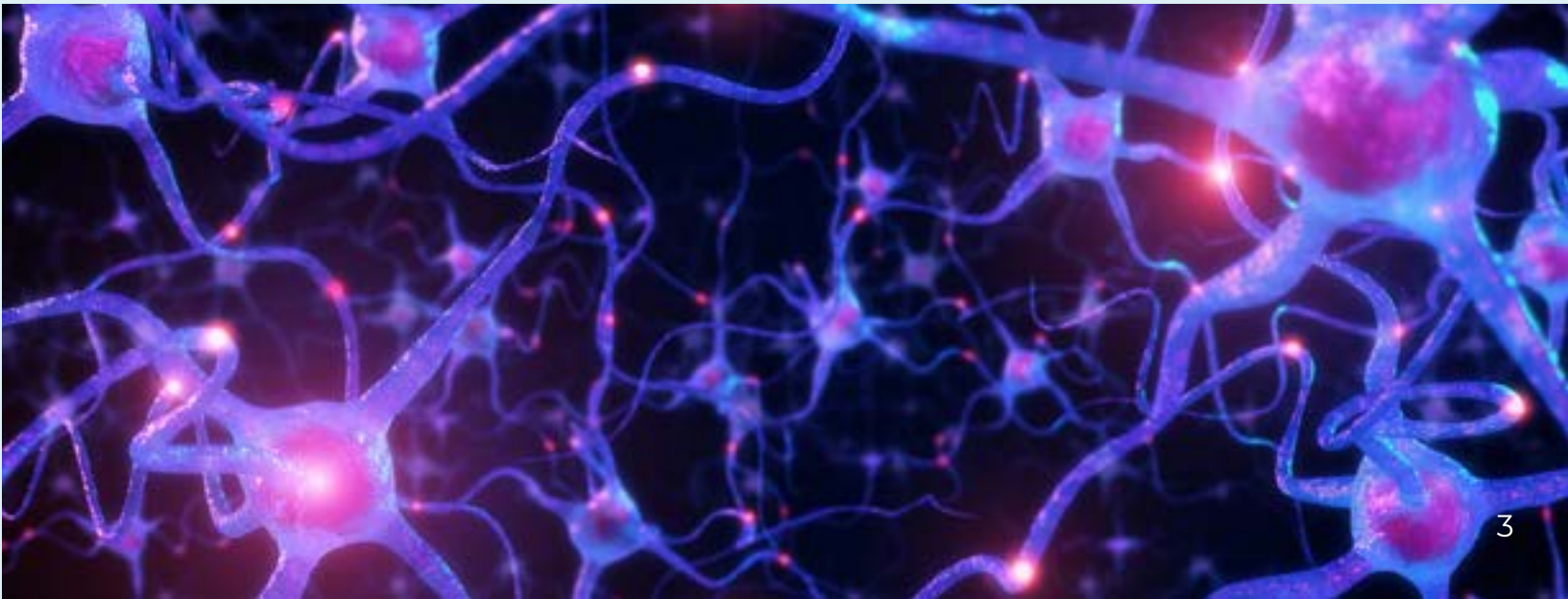
"A concussion is just a ding...."

"I have just had my bell rung."

"I can walk off a concussion just like any other injury."

FACT:

Athletes are particularly aware of how long it typically takes to recover from injuries such as pulls, sprains, strains or even broken bones. A concussion is a brain injury, and can affect your memory, feelings and sense of self. The usual rules and timetables may not apply. If you become active again too soon, you will put yourself at a much higher risk of severe injury.



Causes of Concussion and Prevention Strategies

Concussion Rates Vary by Sport

Of course, the chances that any athlete will get a concussion depend on styles of play, circumstances of competition, and random chance. Still, high school concussion rates vary widely by sport. Examples from the 2023/2024 data collected by the National High School Sports-Related Injury Surveillance Study: 7.09 per 10,000 athletic exposures in football, 6.9 in men’s lacrosse, 6.08 in women’s soccer, 4.51 in wrestling, 4.51 in women’s basketball. The lowest rate reported is .46 for boys’ baseball.

In sports that both genders play, concussion rates are almost always higher for women than men. Female athletes also tend to need more time to recover from concussions than males. It’s not yet entirely clear why, but it is important to encourage young women to take seriously and report fully any symptoms of concussion. And if you have a daughter, you must make sure your coaches, athletic trainers, and health care providers understand that women often return from brain injuries on a more extended timeline than men.

Preventing sports-related concussions:

- Play by the rules
- Practice good sportsmanship
- Use proper technique for the sport
- Make sure end posts are sufficiently padded
- Check the field for uneven areas or holes
- Wear the proper equipment

When in doubt, sit them out!

MYTH:

“Concussions are just a football problem.”

FACT:

Many news reports about concussions over the past few years have focused on NFL players with brain injuries, but the majority of high school sports concussions take place outside football. Beyond football, the riskiest high school sports for concussions include men’s lacrosse, women’s soccer, wrestling and women’s basketball.

Recognizing and Diagnosing Concussions

Concussions can lead to a variety and combination of cognitive problems – meaning trouble with how you think, reason, or remember – as well as physical and emotional issues. When a child has taken a hit or fall and a concussion is suspected they may:

- Seem dazed, disoriented, or stunned
- Appear to be off-balance or have difficulty with coordination
- Have trouble remembering what just happened, such as forgetting plays
- Answer questions inaccurately or slowly
- Lose consciousness

Symptoms reported by your child can include:

- Headache
- Nausea or vomiting
- Balance problems or dizziness
- Blurred or double vision
- Unusual sensitivity to light/noise
- Feeling foggy or sluggish
- Difficulty with sleep
- Irritability
- Problems concentrating or with short-term memory

MYTH:

“I did not get knocked out, so I cannot have a concussion.”

MYTH:

“I only have a headache, no real signs of a concussion.”

FACT:

You do not have to get knocked out or lose consciousness to sustain a concussion. It’s important to report any symptoms fully to your coach, athletic trainer, or parent, even if it’s just that you “do not feel right.”

FACT:

A 2010 poll by *ESPN the Magazine* found that 55.4 percent of high school football players, 33.7 percent of coaches and 29.7 percent of athletic trainers said a player who complains about a headache during a game should be allowed to return to it. That is wrong – and potentially dangerous.

Recognizing and Diagnosing Concussions

If there is a possibility that your child has a concussion, it is imperative that they stop physical activity and remain with someone who will be able to tell if their symptoms are worsening.

Indeed, in the case of young athletes, New Jersey state law requires that anyone “who sustains or is suspected of having sustained a concussion or other head injury ... shall be immediately removed from the sports competition or practice,” and that “the student-athlete shall not participate in further sports activity until ... they receive written clearance from a physician trained in the evaluation and management of concussions.” (Public Law 2010, Chapter 94, C.18A:40-41.4)

Emergency Care

The decision about whether or not to go to an emergency room is often stressful for parents when a child is pulled from practice or competition because a concussion is suspected. You might base that decision on determining if your child’s symptoms are getting better or worse. You might decide to wait until the next day to see your pediatrician; you might decide to go to the emergency department because it is a weekend or holiday. When symptoms worsen in a short time it is best to see a physician immediately either at the physician’s office or in the emergency room to eliminate concern that there is a more severe brain injury.

Call 911 if you observe:

- One pupil is larger than the other
- An inability to wake up
- A headache that continues to worsen
- Weakness or numbness
- Decreased coordination
- Increased confusion or agitation
- Repeated vomiting
- Seizures/convulsions
- An inability to recognize people or places
- Unusual behavior
- A loss of consciousness

If you decide that your child does not need emergency care but is showing signs of a concussion, you need to make an appointment with a health care provider trained to evaluate brain injuries.

Your child must rest their brain to give it a chance to begin healing. Even before you make an appointment with a health care provider, make sure your child decreases their physical movements, mental exertion and use of electronics.

At your child’s school, you may find professionals who can help.

Certified Athletic Trainer (ATC) | Concussion Management Team | School Nurse | School Physician

Recognizing and Diagnosing Concussions

The first appointment post concussion is typically the parents’ choice of the family physician or pediatrician, a concussion center, a sports medicine specialist, or a specialist in a related field like neurology or neuropsychology. Any of these professionals are appropriate, however make sure your child is seen by someone who understands how to assess for concussion. Not all family physicians or pediatricians have this training. Your decision may be influenced by your child’s individual medical history, or your relationship with your family physician or pediatrician, or recommendations made by friends, family members, or school personnel. Following the initial appointment you may be referred to additional specialists that could include a physical therapist, vision specialist, and others.

Look for a concussion professional who can see your child soon. But do not assume you will be able to get everything you need from one doctor; you may need to see multiple specialists, and make sure they communicate and coordinate with one another and with your child’s school. From diagnosis to possible treatments, it takes a team to manage a concussion: you, your child, and the professionals who provide you with health care.

Concussion management varies widely among providers. In seeking a concussion specialist, look for a licensed health care professional who:

- Provides direct patient care
- Has formal training in brain injury, and is knowledgeable about the latest national and international guidelines for managing concussions
- Has at least a year of continuous, regular experience with identifying and treating concussions
- Regularly communicates with other concussion specialists to coordinate care

MYTH:

“Our school does baseline testing, so we can handle concussions.”

FACT:

To address concussion problems, school districts and sports leagues across the country have increasingly turned to computerized neuropsychological tests. But these tests can provide a false sense of security when not properly used. School officials don’t always administer them correctly, or pay proper attention to the results. A 2009 study by researchers at Michigan State University, for example, found that just over half of athletic trainers checked baseline tests to make sure they were valid, and 13.6% said they would or might return athletes to play even if they scored below their baseline. Athletes, parents, and school administrators should understand them as providing one part of the information needed to diagnose and manage concussions.

Recognizing and Diagnosing Concussions

Assessments, Evaluations, and Tests

Brain injury from concussion takes place at a microscopic level that cannot be analyzed by the kind of equipment used by family physician offices and even most hospitals. For example, **CT scans and traditional MRIs do not detect concussions.** Instead, concussion professionals use a variety of assessments to gauge patients’ brain functioning.

Some tests are given “at baseline,” meaning when a student or athlete is healthy. For example, computerized neurocognitive tests score you on your memory and reaction time, and you can then take the test again after an injury to see if your scores have changed. Similarly, schools, athletic programs, or concussion professionals may also test your child’s vision or balance at baseline.

Tests include:

- Computerized neurocognitive/ neuropsychological testing
- Optometric testing, such as the KingDevick Test or VOMS (Vestibular/Ocular Motor Screening)
- Balance testing (Balance Error Scoring System / BESS)
- Exertional testing (typically after a child is symptom-free at rest and back to baseline on neurocognitive testing)
- Neuropsychological evaluation

MYTH:

“If I go to sleep after I get a concussion, I’ll never wake up.”

FACT:

Relative rest – mental as well as physical – is what allows your brain to heal from a concussion. (A sleeping person will respond to touch or sound; an unconscious person will not.)

Treating Concussions

If your child is diagnosed with a concussion, you will need to make sure family, friends, and the school understand that relative rest is the foundation for getting better. The brain needs time to repair itself.

Interventions and Treatment Methods

If symptoms persist, your health care provider may recommend one or more of a wide variety of treatments for your child. Depending on the individual and his or her injury, these could include cognitive rehabilitation or visual therapy, exertion training, vestibular and/or physical therapy, medication or biofeedback for headaches, mindfulness or relaxation exercises, or other alternatives. It is important to communicate with your provider to make appropriate adjustments based on your child’s responses. Remember, it takes a team to manage a concussion.

Helping Your Child Recover from a Concussion

Carefully follow your doctor’s advice; ask questions about anything you do not understand. As your child recovers from a concussion, you must work with your health care provider and school to develop a plan for returning to school and play. This usually involves him/her gradually increasing his/her activities until he/she is ready to get back into the classroom and, in the case of athletes, onto the field.

- Monitor your child. Keep notes about your child’s symptoms, and report them to your doctor. Too much focus on symptoms can cause anxiety which can slow recovery; it is important for your child to know that he/she will get better. If any activity causes symptoms to worsen, stop the activity and make a note.
- Communicate with your child’s school to ensure a smooth transition back to school. Some schools have a Concussion Management Team to support students recovering from concussion.
- Check with your insurance company if you have any questions about coverage for any recommended treatments.
- Educate yourself about concussion.

Long-Term Effects of Concussion

A concussion results in immediate changes in brain function that, most of the time, resolve on their own; many people who have a concussion recover within two or three weeks. Some require longer, sometimes much longer, recovery periods.

Beyond the acute phase of a concussion, meaning the symptoms that occur immediately following an injury, research has shown brain trauma can lead to longer-term dangers:

- Children who get concussions are more likely to have second or third concussions, and high school athletes who have three or more concussions are more likely to experience severe symptoms such as loss of consciousness and amnesia if they have further concussions.
- Young athletes who sustain multiple concussions are at risk of developing memory, emotional and physical problems. The severity of prior concussions, length of recovery, and the amount of time between concussions may be factors that determine the degree of risk for future problems. We may not understand why this happens; however, it is a fact that there are higher risks for long-term problems and longer recovery times with multiple concussions.
- Many people believe that athletes who sustain multiple, repetitive blows to the head over time may eventually develop Chronic Traumatic Encephalopathy (CTE), a degenerative brain disease that can lead to loss of impulse control and emotional breakdowns. The Sports Neuropsychology Society states: "At this time, there is no research that links youth contact sport participation with a risk for CTE." But the specter of CTE rightfully disturbs many athletes and their families. Unfortunately, at this time, we don't know why some people get it and others don't, or how many people will get it, and it can only be diagnosed after death.
- Certain factors have been shown to affect recovery such as a family history of migraines, co-occurring physical disability or injury, learning disability, medications prescribed for psychological diagnoses, attention-deficit/hyperactivity disorder, or previous concussion or other brain injury.



Return to Learn, then Return to Play

Graduated Return to School

Concussions can significantly affect a student's concentration, attention span, functioning, and processing speed. And while your child is healing from a concussion, mental exertion can exacerbate his/her symptoms and prolong his/her recovery.

As a result, a student may require academic accommodations or modifications, which should be tailored to his/her needs and limitations. These can include:

- Spending fewer hours at school
- Fewer hours reading, writing, texting or using computers
- Taking rest breaks during the school day
- Help with school work
- More time to complete assignments
- Early dismissal to avoid crowded hallways



Return to Learn (RTL) Strategy

After an initial period of relative rest (24-48 hours following an injury), students can begin a gradual and incremental increase in their cognitive load. The steps below explain the progression of activities students should undertake to get back to the classroom. Progression through the strategy for students should be slowed when there is more than a mild and brief symptom exacerbation. *

Step	Mental Activity	Activity at Each Step	Goal
1.	Daily activities that do not result in more than a mild exacerbation* of symptoms related to the current concussion.	Typical activities during the day (eg, reading) while minimizing screen time. Start with 5–15 min at a time and increase gradually.	Gradual return to typical activities
2.	School activities	Homework, reading or other cognitive activities outside of the classroom.	Increase tolerance to cognitive work
3.	Return to school part time	Gradual introduction of schoolwork. May need to start with a partial school day or with greater access to rest breaks during the day.	Increase academic activities
4.	Return to school full time	Gradually progress in school activities until a full day can be tolerated without more than mild* symptom exacerbation.	Return to full academic activities and catch up on missed work

*Mild and brief exacerbation of symptoms is defined as an increase of no more than 2 points on a 0–10 point scale (with 0 representing no symptoms and 10 the worst symptoms imaginable) for less than an hour when compared with the baseline value reported prior to cognitive activity.

Return to Play (RTP) Strategy

This is a guide, but this process will be different for every person depending on what specific sport, position, and level of activity they participate in. The goal is to provide a series of activities with gradually increasing complexity and intensity to challenge the person prior to return to contact related activities to ensure that the person’s brain is functioning normally as an indicator that the concussion has recovered. It is important to follow a gradual return to minimize the risk of prolonged recovery, complications, further injury to the brain, and Post-Concussion Syndrome.

Step	Exercise Strategy	Activity at Each Step	Goal
1.	Symptom limited activity.	Daily activities that do not exacerbate symptoms (e.g. walking)	Gradual reintroduction of work/school
2.	Aerobic Exercise 2A – Light (up to approximately 55% maxHR) then 2B – Moderate (up to approximately 70% maxHR)	Stationary cycling or walking at slow to medium pace. May start light resistance training that does not result in more than mild and brief exacerbation of concussion symptoms.*	Increase heart rate
3.	Individual sport-specific exercise Note: If sport-specific training involves any risk of inadvertent head impact, medical clearance should occur prior to Step 3	Sport-specific training away from the team environment (e.g., running, change of direction, and/or individual training drills away from the team environment). No activities at risk of head impact.	Add movement, change of direction
4.	No contact training drills	Exercise to high intensity including more challenging training drills (eg, passing drills, multiplayer training) can integrate into a team environment.	Resume usual intensity of exercise, coordination and increased thinking
5.	Full contact practice.	Participate in normal training activities.	Restore confidence and assess functional skills by coaching staff
6.	Return to sport.	Normal game play.	

Return to Learn, then Return to Play

*Mild and brief exacerbation of symptoms is defined as an increase of no more than 2 points on a 0–10 point scale for less than an hour when compared with the baseline value reported prior to physical activity.

Athletes may begin Step 1 (i.e., symptom-limited activity) within 24 hours of injury, with progression through each subsequent step typically taking a minimum of 24 hours. If more than mild exacerbation of symptoms (ie, more than 2 points on a 0–10 scale) occurs during Steps 1–3, the athlete should stop and attempt to exercise the next day. Steps 4–6 should begin after the resolution of any symptoms, abnormalities in cognitive function and any other clinical findings related to the current concussion, including with and after physical exertion. Athletes experiencing concussion-related symptoms during Steps 4–6 should return to Step 3 to establish full resolution of symptoms with exertion before engaging in at-risk activities. Written determination of readiness to RTP should be provided by a healthcare professional before unrestricted RTP as directed by local laws and/or sporting regulations.

Guidelines for younger children, from Kindergarten through Grade 8, suggest additional days of rest and recovery. Be sure to consult your concussion professional before starting a return-to-play protocol.

Dangers

Students who don’t fully report their symptoms as they recover, or who return to school or play before their concussions have resolved, put themselves at greater risk of needing even longer to recover, and of getting injured again. *It is dangerous to play through a brain injury, or to carry on any strenuous physical or mental activity when a concussion could still be affecting a child’s cognitive function, vision or balance.* Places and activities with higher risk for concussion should be avoided.

In rare cases, taking another hit before full recovery can lead to catastrophic head injury, including “Second Impact Syndrome,” which leads to rapid swelling of the brain, resulting in severe brain injury or death.

MYTH:

“I got a concussion, but now I’m cleared to play again, so everything’s cool.”

FACT:

- Getting a green light to return to play is great, but only valid if you can answer “yes” to three questions.
1. Did your child report all of their symptoms fully and honestly? Athletic trainers and doctors can evaluate you properly only if they have all the information they need.
 2. Was your child checked out by a doctor who specializes in the treatment of concussions? If your team or family physician doesn’t, make sure you ask to be referred to one who does, because non-specialists can overlook critical symptoms.
 3. Is this your child’s first or second concussion? If your child has already had multiple blows to the brain, it’s time to talk with your child and coach about their athletic future, because research says they may be putting themselves at a significantly higher risk for long-term brain damage.

Looking Ahead: The Frontiers of Science

Our understanding of the brain is constantly evolving and advancing, providing new insights into the damage concussions cause and new hopes for preventing, diagnosing and treating brain injury.

Some possibilities currently being studied include:

- New imaging techniques showing concussions can lead to structural changes in the brain, not just changes in behavior.
- Genetic tests, blood tests or bio-markers might show when people are at particular risk for brain injury.
- A test that would identify CTE in the living.
- Researchers are seeking more effective treatments for brain injuries.

The vast potential of science highlights just how much we still have to learn.

Students and Athletes as Advocates

Children and teenagers who have had concussions have unique credibility when it comes to helping their peers deal with brain injury. If your child has a concussion, you can learn from the experiences of students who have successfully recovered. And afterward, consider telling your story.



Terms and Definitions

Balance Testing

The Balance Error Scoring System (BESS) is commonly used to assess any balance problems (“postural instability”) an athlete might experience after a concussion. The test consists of three stances: double leg, with the legs spread pelvic-width apart; single leg, with the athlete standing on their non-dominant leg and the other bent at the knee; and tandem, with one foot placed in front of the other. The test is done on both a firm and foam/soft surface. Your child’s doctor might also do other balance testing as needed.

Biofeedback

Biofeedback is an alternative treatment often used for persistent headaches. With biofeedback, the patient is connected to electrical sensors that help the patient receive and measure information about their body. A trained professional teaches the patient how to make subtle changes to their body to reduce the pain.

Certified Athletic Trainer (ATC)

A Certified Athletic Trainer is a health care professional who works under the direction/ supervision of a licensed physician to provide health care to athletes. New Jersey has ATCs on staff at most high schools; they provide on-site evaluation and treatment for the injured student-athlete, immediate first aid care, follow-up rehabilitation care, and specific conditioning programs for injury prevention. The ATC is often the first professional to see the concussed student-athlete from the sidelines and remove him or her from play. They will often make the call if paramedics are needed in more serious injuries. Importantly, ATCs are often the individuals who will perform physical exertional testing and the graduated return to play protocol prior to the athlete receiving clearance to return to sports.

Cognitive Fatigue

Cognitive fatigue is different from fatigue caused by strenuous activity. A person tired from physical activity may take a nap or get a good night’s sleep and be refreshed. In the context of brain injury or concussion cognitive fatigue can be caused by too much challenging cognitive or physical activity; it is often not relieved by a nap or a good night’s sleep. It may take a couple of days of rest before the fatigue lifts. When recovering from concussion it is recommended to gradually increase cognitive and physical activity to prevent cognitive fatigue. A child may require more rest than usual while recovering. Cognitive fatigue can lead to behavioral problems, mood swings, and more difficulty with schoolwork.

Cognitive Rehabilitation

Cognitive rehabilitation is a type of therapy to target cognitive impairments such as attention and concentration challenges. This therapy works to improve one’s ability to perform the impaired function through therapy and practice as well as help to develop strategies to compensate for any continuing impairments. Cognitive rehabilitation may be provided by a neuropsychologist, speech-language pathologist, or other specialists trained in cognitive rehabilitation.

Computerized Neurocognitive Testing-- Baseline and Post-Concussion

Computerized neurocognitive testing evaluates skills that are most often affected by concussion, such as verbal and visual memory, visual motor speed (speed of visual processing) and reaction time. Baseline testing is administered prior to an athletic season since its purpose is not to diagnose a concussion but to report how an athlete scores with an uninjured brain. Following a concussion, these tests should be re-administered and the scores compared to the baseline scores to help track the extent of functional impairment and monitor the progress of recovery. These tests are just one tool that can be used to help make return to play decisions. There are a variety of tests on the market such as ImpACT, Head-minder, Axon, CNS Vital Signs, Cogsport, and ANAM. Administration may take 20 to 30 minutes. The computerized versions are currently used for ages 10 and up. However, young athletes in the 10 - 12 or so age range will need extra guidance and attention to be sure they understand instructions. (Be aware that different testing programs have different guidelines for appropriate use. For example, a program may only be approved for use with athletes within a certain age range. Check to be sure that baseline test scores have been reviewed for validity.)

Concussion Management Team (CMT)

Schools can best support a student recovering from concussion by establishing a Concussion Management Team. The Team should minimally include an academic monitor and a symptom monitor. The Team functions as a liaison between the student, parent, teachers, and clinician managing recovery. Contact the Brain Injury Alliance of NJ to learn more about CMTs.

Difficulty with Sleep

As a symptom of concussion difficulty with sleep may mean difficulty falling asleep or staying asleep, insomnia, feeling drowsy, or sleeping more or less than usual.

Emergency Room Physician

Treatment in an emergency room typically serves to eliminate the possibility of more severe brain injury. The physician may not order a CT or MRI unless there are signs of severe injury so as not to expose children to unnecessary radiation. Emergency room treatment should always be followed up with a family physician, pediatrician, or sports medicine physician.

Exertional Testing

Once a child is symptom free while at physical, cognitive (mental), and social rest and neurocognitive testing indicates that performance is back to baseline or better, the child should start undergoing exertional testing to determine if they are symptom free when physically stressed. Exertional testing should be done under the supervision of the certified athletic trainer or another sports medicine health care provider. Physical activity levels should be increased gradually in a step-wise process following a graduated return to play protocol. If at any point, the athlete experiences symptoms again, they should return to physical, cognitive (mental), and social rest for another day or two and return to the previous level of activity that caused no symptoms.

Terms and Definitions

Medication

Pharmacological intervention is not commonly prescribed in most cases of concussion as symptoms typically resolve themselves with physical, cognitive (mental), and social rest. There is no known medication that “cures” the concussion itself, but medications may be prescribed to treat lingering symptoms such as headaches, depression, anxiety, sleep difficulties and mental foggyiness.

Neuroimaging

Sometimes neuroimaging may be ordered in an emergency room depending on the signs and symptoms of the injury. Emergency room physicians are not likely to order neuroimaging studies in cases where the signs and symptoms support a diagnosis of concussion rather than more severe brain injury. They are cautious about exposing children to radiation and will typically request a CT scan only in cases of possible deteriorating neurological functioning, which is not typically the case in concussion. Following acute care, in cases where a child is not recovering as expected, neuroimaging tests including a CT scan or MRI may be ordered by the treating physician or neurologist. The purpose of these tests is to rule out a brain bleed, skull fracture, or other brain disease. Neuroimaging testing may also be ordered for the child when symptoms such as a headache persist.

Neurologist (MD or DO)

A neurologist is a physician who specializes in diseases and disorders of the nervous system. A neurological evaluation may be requested when a child has persistent symptoms of concussion that do not go away. Neurologists can assist with headache, cognitive slowness, and sleep disturbance and may use different medications to treat concussion effects. Neurologists may conduct further tests, such as an EEG to examine brain wave functions.

Neuropsychologist (PhD or PsyD)

A neuropsychologist is a licensed psychologist who specializes in how brain structures and systems affect cognition (thought), emotions, and behavior. Brain function is evaluated by testing cognitive and thinking skills such as verbal and visual memory, processing speed, attention span and reaction time. They are skilled in interpretation and in understanding of baseline and post-concussion neurocognitive testing and in understanding how other conditions (like attention and learning disorders) may affect recovery. A neuropsychologist may provide treatments like cognitive rehabilitation or psychotherapy. A neuropsychologist may be involved with your child to assist in developing a plan of academic accommodations while healing takes place, as well as to provide counseling and psychotherapy to address emotional and behavioral symptoms and social adjustment issues.

Neuropsychological Testing

Formal neuropsychological consultation may be recommended when a child or student- athlete’s symptoms persist. A neuropsychological evaluation can help determine which functions of the brain have been disrupted and what these changes mean in the person’s day-to-day life functioning. A neuropsychologist can provide a treatment plan with recommendations to assist the child in recovery. If the child’s symptoms do not resolve, and post-concussion syndrome is diagnosed, more comprehensive testing may be recommended to determine any residual, enduring effects from the concussion.

Neuro-optometric Testing

The VOMS (Vestibular/Ocular Motor Screening) test can support a diagnosis of concussion. Using simple equipment like a metronome and tape measure, a neuro-optometrist can assess five different vestibular and ocular systems to gain insight into each individual’s injury. Other neurooptometric testing is recommended when the child’s acute medical management is completed but symptoms such as imbalance, visual confusion, or reading difficulty following the concussion persist. Neuro-optometric evaluation will generally include tests for eye coordination, focusing, and eye movements, as well as spatial perception and visual memory.

Neuro-optometrist (OD)

A neuro-optometrist is a licensed optometrist with special training in testing and therapy for neurological dysfunction that affects the visual system. A neuro-optometrist can address problems such as blurred or double vision, orientation problems, reading difficulties, visual attention deficits, or visual memory deficits. They often conduct further tests of visual function well beyond the “vision chart” to test for the ability to maintain fixation, physical focus, fusion (the ability to use both eyes together as a team), and tracking skills. A Visual Evoked Potential (VEP), a special type of eye exam, is often used to examine brain function.

Nurse Practitioner (NP)

Nurse practitioners are registered nurses with advanced educational and clinical training who provide acute and preventative health care services. NPs may also examine and treat conditions such as concussion. NPs practice independently or in collaboration with a physician and may prescribe most medications.

School Nurse

The school nurse is the point person during school hours when injuries occur in sports as well as in physical education classes and recess. The school nurse can help monitor the child’s symptoms and recovery as well as provide a place for them to go for a rest break. If the child has been prescribed medications by a doctor, the school nurse will help manage the medications while the child is in school.

Terms and Definitions

Physician (MD or DO)

Any child who has experienced an event and a concussion is suspected, needs to be properly examined initially by a medical physician to diagnose or rule out a concussion or more severe traumatic brain injury. The physician can be a primary care physician such as a pediatrician or family medicine physician, a sports medicine physician, or an emergency medicine physician. If a child is diagnosed with a concussion the physician will then set up a plan for proper management for a safe recovery and return to school and sport. The physician will act as the gatekeeper to help coordinate the multidisciplinary approach.

Physician’s Associate (PA)

A physician’s associate is a healthcare professional who practices medicine under the supervision of a medical doctor. Similar to a medical doctor, your child may be examined and managed by a PA.

Physical Therapist (PT)

A physical therapist treats muscular and skeletal issues and may be involved if a child is experiencing dizziness, balance problems, or pain from a neck injury (if one occurred at the time of the concussive event). PTs may provide treatment such as vestibular physical therapy to address issues with dizziness and balance as well as exercises for reconditioning.

Psychotherapy/Counseling

When symptoms of a concussion do not resolve completely, children may be affected emotionally as they try to handle the new challenges they face in daily life. Psychotherapy can be beneficial in helping the athlete learn coping strategies to deal with the demands and pressures he or she faces.

Speech-Language Pathologist (SLP)

A speech-language pathologist evaluates problems with communication and assesses the strength and coordination of the muscles used in speech and swallowing. The SLP will also evaluate a patient’s understanding of reading, writing, and grammar; interpretation of jokes and sarcasm; and their ability to solve problems, plan out the steps of a task, and recall recent information. They can often provide cognitive rehabilitation therapy.

Vestibular and Balance Treatment

Vestibular therapy may be prescribed when the athlete experiences balance problems that persist after the concussion. Symptoms can include dizziness and feelings of vertigo.

Vision Rehabilitation Therapy

Vision rehabilitation therapy, along with the use of special lenses or prisms in glasses, relieves symptoms originating in the visual system. Symptoms may include sensitivity to light (photophobia), double vision, blur, leaning or veering during mobility, headache, or reading difficulties that begin at the time of the concussion.

How can the Brain Injury Alliance of New Jersey Help?

BIANJ offers a range of free services designed to support individuals and families from the moment of injury through the recovery process. In addition, BIANJ provides education, advocacy and prevention information.

DIRECT SUPPORT

- Information and Resources Helpline
- CARES Case Management and Resource Facilitation
- Support Groups
- Peer Mentoring
- Education for individual and family
- Social/Recreation Outing
- Respite/Camp

EDUCATION & PREVENTION

- Webinars and trainings
- Safety workshops
- Comprehensive resources
- Speakers Bureau
- Professional Seminar

CONTACT BIANJ

Call 732-783-6172 or visit www.bianj.org





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