Concussion

A guide to understanding
Mild **Traumatic Brain Injuries**
for Survivors, Caretakers,
and Loved Ones

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Disclaimer - **This booklet is intended to serve as a detailed, but not all-inclusive, summary of topics related to concussion. The authors have taken care to ensure that the information is correct and up to date at the time of printing. However, as new information becomes available, changes in medical approaches and understanding become necessary. Thus, this material is for informational purposes only and does not replace the advice or counsel of a doctor or healthcare professional. Readers should consult with, and rely only upon the advice of, their physician or healthcare professional. The authors, editors, and Cognitive FX Foundation disclaim responsibility for any liability, injury, loss, or damage incurred as a consequence, directly or indirectly, of the use and/or application of any content contained herein.**

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Table of Contents

What is a Concussion?

A concussion is classified as mild traumatic brain injury (mTBI). In mTBI, there is no clear structural damage (like a hole in the brain) to cause symptoms, but rather healthy brain cells stop functioning properly due to the injury. A concussion is typically not revealed in standard brain scans like MRI and CT because these scans are designed to identify structural damage and generally cannot detect the injury caused by mTBI. Injury from mTBI impairs the blood flow and metabolic processes of healthy brain cells.

A concussion is a **complex brain injury** that can occur from any of the fallowing conditions:

mTBI does not mean the symptoms are mild

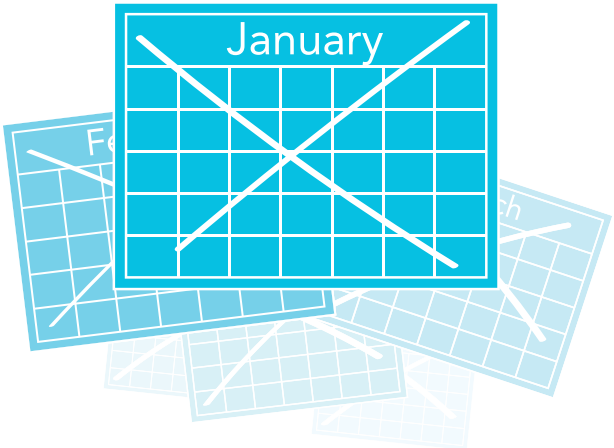
The term mild traumatic brain injury should not imply that the actual damage is mild. Even small changes in the way the brain works can cause big problems in a person's life. When you have a concussion you can have a healthy and normal appearance (including normal looking MRI or CT brain scans) yet still be suffering from a very complex injury.

Concussions often happen simultaneously with other physical injuries that affect vision, balance, and

coordination, which makes proper diagnosis and treatment very difficult. As a result of the complexity of a concussion, your psychological health, self-esteem, interpersonal relationships, and everyday school or work life can be severely affected.

Sometimes concussion symptoms can resolve partially over time. (Howell, Mannix, Quinn, Taylor, Tan, & Meehan 2016) There is a good chance that if symptoms do not resolve after six weeks, proper treatment may be required in order to fully resolve post-concussion symptoms.

This means that a concussion that happened several years ago could still be impacting you now.



How do I minimize the Risk of a Concussion ?

Accidental concussion, or brain injury can occur in a variety of settings and situations, many of which are unpreventable. Nothing can ultimately prevent a concussion, but there are things that can be done to lower the risk. Lowering the risk begins with being aware of activities and behaviors that increase the risk of head or neck injury. General alertness and a constant awareness of surroundings and potential hazards helps to avoid injuries. If you participate in sports, best practices should be developed to lower your risk of a brain injury.

Did You Know?

When looking at just TBI-related deaths, **motor vehicle crashes** were the third leading cause (19%) in 2013.

Overall suggestions to lower the risk include:

- **Always wear the appropriate helmet** for the activity or sport.
- **Always wear your seatbelt.**
- **Be aware of your surroundings,** looking for things that can cause a fall or slip.
- **Create a safe living space** for yourself and children.
- **Eat healthy foods** for the brain.
- **Exercise 3-5 times a week** to help the body and brain work together.
- **Pay attention to where you are going.** This includes refraining from texting while driving and walking.
- **Never drive while drowsy or under the influence** of drugs or alcohol.

It is important for athletes, and any others who participate in hazardous work environments, to know that while protective equipment like helmets can help reduce the risk of injury, it cannot guarantee safety from a concussion.

Helmets don't guarantee safety from concussions because the brain rests in fluid, unattached to the skull. Any sudden movement or collision can cause the brain to impact the inside of the skull, causing brain damage despite a helmet protecting the outside of the head.

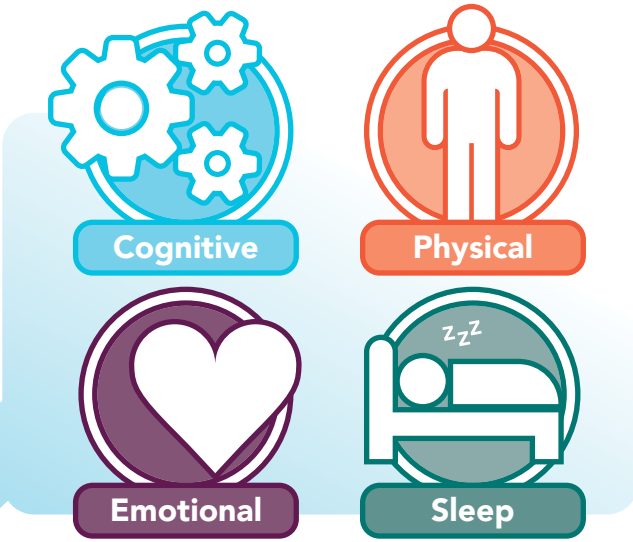
Knowing a concussion cannot fully be prevented, it is best to have a plan in place to minimize risk and to properly assess and take action should a concussion occur.

The fluid that protects the brain is called **Cerebrospinal Fluid** and acts like a cushion or protective barrier.

How do I recognize a Concussion?

A concussion often occurs from impact to the head, but it is important to know that it can also occur from abrupt head or neck movement alone or from a nearby shockwave like an explosion. A concussion can occur *without* a loss of consciousness and can sometimes occur when you may not initially feel the injury is serious. **A concussion can affect you for the rest of your life regardless of the age it occured.**

Although concussions can present in many different ways, a true concussion has symptoms in one or more of four main categories:



Cognitive - Foggy thinking and impaired focus, memory, and reaction speed

Physical - Headache, light sensitivity, and neck pain

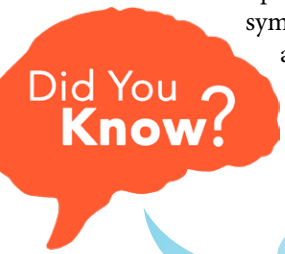
Emotional - Depression, anxiety, and irritability

Sleep - Trouble falling and staying asleep and fatigue during the day

After a concussion, it's likely that many of your body's systems have been damaged, not just the brain. These other injuries could include the inner ear, spine, eyes and vision, nerves, bones, heart and blood vessels, muscles, or tendons.

Although you may look totally normal, you could still have several new physical, cognitive, or emotional symptoms that can greatly lower your quality of life, and make you feel very alone.

Since you can appear physically normal, family, friends, employers, and even medical professionals may express doubt that there is an injury or may wonder if you are exaggerating your symptoms. You may even doubt yourself and try to shrug off symptoms or push through symptoms, denying there is anything wrong. Your specific **symptoms should not be ignored**, as they are very likely outward evidence of complex internal damage.



It is important not to only focus on symptoms without adequately assessing and treating the brain first. Seeking out comprehensive assessment is important if short and/or long term concussion symptoms persist.

A concussion is called a Mild Tramatic Brain Injury because, though there is still an injury to the brain, the injury is typically not visible under a standard MRI scan.

Short Term Concussion Symptoms (0-9 Days)

- Lightheadedness
- Headaches
- Disorientation
- Cognitive and memory problems
- Difficulty concentrating
- Personality changes
- Sleep disturbances
- Emotional disturbances
- Seizures
- Whiplash or neck pain

Long Term Concussion Symptoms (Months to Years)

- Personality changes (abrupt, argumentative, stubborn, opinionated, or suspicious)
- Irritability, anxiety, and depression
- Intolerance of noise
- Feeling overwhelmed in crowds
- Cognitive decline
- Impaired memory and concentration
- Fatigue and disruption of sleep patterns
- 15-20% of those injured develop symptoms meeting criteria for psychiatric disease (PTSD, anxiety, panic disorder, and depression)

What do I do if **I Have a Concussion**?

There is a wide range of thought on how to treat a concussion, even among physicians specializing in the same field. This is because physicians and specialists vary greatly in their experience, knowledge, and true understanding of what a concussion is and how to handle it. Cognitive FX's thoughts on what to do after getting a concussion are based on recent publications, our own research and peer-reviewed publications, and our own best practices created while working with hundreds of concussion patients from around the world (Epps and Allen, 2017).

When you seek out care, it's important to find health professionals who are best trained and experienced to provide you with care in the following categories:

Diagnosis

How will your concussion symptoms be distinguished from other potential health issues that might cause similar symptoms?

The first step is to determine if there is any physical damage that needs to be treated urgently, such as brain bleeding or fracture of the skull. A family doctor will typically be able to direct you to the right source of treatment and may refer you for standard imaging like MRI, or CT. However, it is important to remember that these standard scans cannot detect the brain dysfunction caused by a concussion. These scans only detect structural damage and should not be used to "clear" you of brain injury. **If these initial scans show no signs of physical damage, that does not mean you don't have a concussion.**

Since standard MRI or CT cannot detect concussion, your physician may then refer you for advanced brain scans such as functional Neurocognitive Imaging (fNCI) (Wing, 2017). fNCI detects which parts of your brain may have been injured and are no longer functioning appropriately after a concussion.

If, after your diagnosis, symptoms do not alleviate after about four to six weeks, the physician should refer you to a neuropsychologist to handle further assessment.

Assessment

After learning what parts of your brain have been affected, you will want to know how it relates to the symptoms you are currently experiencing and how treatment will help your particular brain injury. **You will want to know which symptoms are coming from brain dysfunction and which symptoms are coming from physical or other injuries related to the concussion.** A neuropsychologist is usually best suited to do this assessment. In order for an assessment to be truly useful, it needs to go beyond being simply "informative" and give you and your medical providers a clear treatment plan for your individual rehabilitation program.

Treatment

Although post-concussion symptoms can vary widely from person to person, there are four general categories

that scientists and doctors use to group common symptoms:

- **Cognitive** - Impaired focus, memory, and reaction speed
- **Physical** - Headache, light sensitivity, and neck pain
- **Emotional** - Depression, anxiety, and irritability
- **Sleep** - Trouble falling and staying asleep and fatigue during the day

As a patient, **you need to know specifically how you will be helped in each of these areas**. What kinds of therapists will you see? What exactly will they do? And how will they know if what they are doing has been effective?

Recent research indicates that rest may not be helpful after a certain period of time and may even be detrimental (Meehan and Bachur, 2015). Knowing when to stop resting and start other activities for active treatment is important. The risk of a second impact--and second concussion--causes many patients to remain inactive for long periods of time. It is important you do not make this mistake. Avoiding high risk activities may be the right choice,

but having long periods of inactivity while waiting for all symptoms to resolve can minimize necessary brain stimulation. This can slow down your recovery.

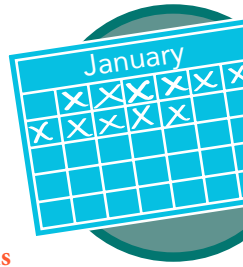
Appropriate activity ultimately helps the brain heal. **The very best concussion programs should have a multidisciplinary approach, bringing together a range of experts, clinicians, and therapists.** These therapists can focus on all your various symptoms caused from your concussion simultaneously. This is important because combined symptoms often make each individual symptom worse. For example, it's difficult to make progress in cognitive improvement when lagging headache or sleep issues are not being addressed. It is preferable to have all rehabilitation activities done at a single location, with as much coordination and cross-communication among doctors and therapists as possible, and within a well-paced time frame.

Medications

Some medicine for pain and sleep can be useful, while others can cause slowing of the muscles and nerves. Antidepressants, anti-seizure, and migraine medication should *not* be the first approach to treatment for a concussion. Be aware that **some**

medication side effects may actually mimic concussion symptoms, making concussion treatment and improvement hard to evaluate. In addition, these types of medications generally only address the symptoms and not the underlying cause of the symptoms.

Management



As a concussion patient, the final piece you should look for is what your plan will be for continued improvement and long-term retention of recovery gains from your treatment. **A good treatment approach should provide you with tools and training on how to maintain optimal brain health.** In addition, it should offer methods to monitor your progress and make sure your symptoms stay in check over the next several months.

Did You Know?

If you are still dealing with symptoms after 30 days, then it is a good time to schedule an appointment with a facility offering active treatment methods.

How can I help those affected by Concussion Symptoms ?

Family and friends of those affected by a concussion or brain injury are some of the most loving, strong, amazing people. Living with someone who sustained a concussion can be incredibly stressful and exhausting. Being a caregiver is extremely difficult, even though you love the person you're caring for. It's frustrating because a concussion is an injury you can't see and is difficult to understand. The loved one didn't sustain the actual injury, but they can feel the effects of the injury on every level.

Did You Know?

A concussion is a real injury with real symptoms and impairments. After a concussion it can be very hard to understand and see the severity of these impairments. However, this does not make the impact on an individual any less real.

Ways another's injury could influence a loved one:

- Insomnia
- Nightmares
- Fatigue
- Anxiety
- Depression
- Appetite changes
- Headaches
- Memory problems
- Financial strain
- Job loss
- Relationship difficulties
- Faith crisis
- Any number of life struggles

Parents of those affected by concussion symptoms:

As a parent, it is important to know that symptoms can evolve and get worse over time. You may experience feelings of frustration, empathy, and in some cases even heartache, hopelessness, and fear. It's hard to watch your child suffer and feel you can't do anything about it. Your child may have personality changes, act out, or get angry easily. Eating and sleeping habits can change. Your child may have chronic headaches or pain. Your child is scared. They

may even talk about dying or giving up. This injury can impact everyone involved and their quality of life. Parents may feel like they're going crazy and no one else gets it. If you're feeling lost, confused, and don't know where to turn, don't give up. Try to keep yourself, and your loved one, safe. Try to see things through your child's eyes. It will strengthen your relationship. Work to develop a new love and respect for this new person.

Spouses of a Brain Injury Survivor:

As a spouse or partner of someone with a brain injury, you may experience feelings of guilt, confusion, anger, irritability, sadness, disappointment, and discouragement. You may be impatient, questioning why they can't remember the thing you just talked about, at length, six or more times. There may be personality changes and communication difficulties. Do not take it personally. You may need to communicate differently than you've done before. For example, develop a hand signal, for you both to use, to alert the other that the situation has become

overwhelming and a break is necessary.

Potential Challenges for Loved Ones:

If they push themselves to do an activity, they may need to rest. Validating what your loved one is going through has significant benefits to your relationship. Acknowledging that they have severe physical pain, along with a variety of real post-concussion symptoms will be seen as understanding, loving, and helpful. Right now, feeling understood is a powerful healing tool. Suicidal thoughts are a possibility after a brain injury. Assess for emotional health as often as you can. There are treatment possibilities available to you and your loved one.

Every brain, every injury, and every recovery is unique. Sometimes it can be difficult to see beyond your spouse/child/friend's injury. There are many questions that don't seem to get answered. You've taken your spouse, or child, etc. to numerous doctors of various backgrounds, had several different exams, scans, and tests done; all of which are a financial strain to you

and your family and show no visible injury. Docotrs may give you confusing or differing opions. You question if anything will ever work, if it will ever get better, or if your loved one will ever be themselves again. They are not the same.

The injury may be invisible and difficult for you to understand, and they're not crazy – neither are you. You're not the same anymore. Sharing hope when you yourself feel hopeless can be daunting but, it is worth doing!

Suggestions for Loved Ones:

- **Encourage** injured adults to sign release of information forms allowing you to schedule appointments and have doctors share information with you.
- **Be their advocate.** When attending doctor's appointments, ask questions, take notes, stand up for yourself and for your injured loved one.
- **Be aware of medication side effects.** Know that medications can mask symptoms and may cause other symptoms that resemble brain injury (i.e. foggy thinking, fatigue). Use a pill box to manage medications if necessary.
- **Use a planner/calendar/schedule** to keep track

of doctor's appointments, physical therapy, cognitive therapy, etc.

- **Monitor your finances** and be sure you have all billing and account numbers, login information, and passwords.
- **Be willing to educate others** about brain injuries and your situation (teachers, coaches, principals).
- **Stay in touch** with family and friends and go out socially, if possible.
- **Simplify living.** Get help with the yard work, the kids, meals, transportation, or anything else that may cause additional stresses.
- **Ask for support.** Have a list of things people could do to help. When others offer to help, have the list available giving them options.
- **Journal.** Both for documentation and to let things go. Journaling can be an amazing stress reliever.
- **Look for triggers.** When the brain injury survivor seems angry try to figure out if there is a physical catalyst. Examples of triggers include: overstimulation from the environment (bright lights or sounds), blood sugar levels/hunger, headache, stress, pain, etc.
- **Enjoy the little things.** Cling to the moments of triumph and find laughter. Definitely laugh!

Further your education regarding concussions

and other brain injuries, including assessment, diagnosis, and treatment of post-concussion symptoms.

- **Take time for self-care.** You must take care of yourself before you'll be capable of taking care of someone else; think of an airline attendant suggesting you put your oxygen mask on before assisting someone else.
- **Healthy living.** You must get enough rest, eat healthy meals, exercise, and take breaks. Ask others for help. See a therapist for additional emotional support.
- **Recognize you're not alone.** There are numerous support networks available to validate your feelings, struggles, and offer suggestions; understanding goes a long way and is more helpful than you may realize.

Be patient with your loved one and give them time. The road to recovery could take time. Be patient and kind to yourself! It's heartbreaking and you're human. Be their advocate and their voice, as they may not feel up to it or not know what to ask. Be their memory, as they may not remember things that were discussed during appointments. Be their reasoning mind. Protect them. Love them. They'll appreciate you.

How can a Return to Learn Protocol Help Me ?

Recently, there has been a call for the need of legislation to implement a universal Return to Learn protocol. Return to Learn will provide structure to support students returning to school after a concussion or brain injury.

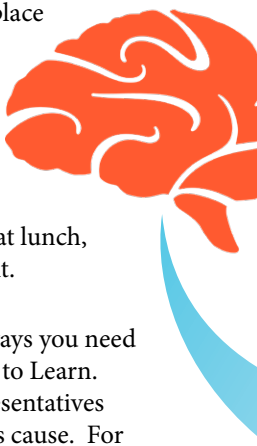
Going back to school can be difficult if you've had a concussion. Proper diagnosis and treatment is important if you want to continue your education. Even after treatment and recovery, reintegration into full-time studies can be hard. It can be hard because of time missed due to your injury or residual post-concussion symptoms that haven't resolved.

Most schools and universities have support programs for students going back to school, but the level of

support varies by state and regulations. Many of these programs don't provide the means necessary to fully assist students who have suffered a concussion.

Changes in legislation need to happen to improve concussion support in Return to Learn, which requires awareness and communication within the community. Sharing this information and talking with others about the impact of concussion on students can help raise awareness and bring about large-scale change.

There needs to be a consistent plan in place for all students who have been injured to have accommodations such as: more time on tests, supplies (i.e. ear plugs), the ability to have more breaks throughout the day, access to notetakers, study buddies, recorded class lectures, a quiet environment to eat lunch, and overall support and encouragement.



We encourage you to speak up about ways you need support in your own life as you Return to Learn. Contacting your state and federal representatives is one good way to start supporting this cause. For an example of a current bill in legislation reference Illinois Bill HB 4226, or find Return to Learn laws in Michigan, New York, Hawaii, and other states.

What about Return to Play ?

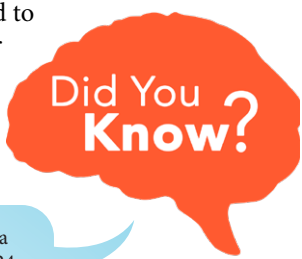
If you are an athlete with a concussion, there should be a focus on Return to Play in addition to Return to Learn. Return to Play protocols also vary by organization and by state regulations. A typical Return to Play protocol will include: a period of rest, along with a plan of action to slowly integrate back to full activity levels.

Typically the steps included in this plan are:

1. Light non-contact aerobic activity
2. Moderate non-contact activity
3. Heavy, non-contact activity
4. Full contact practice
5. Return to full participation

It is very important that your healthcare provider manage your injury throughout the entire recovery process. Be sure that your doctor is tracking your progress in physical and cognitive areas. Your doctor also needs to review your concussion history.

No two brain injuries are the same. You will have specific needs and goals for your doctor to address. Together, you can work on a recovery plan that will allow you to Return to Play and to be an active participant in your life again.



The most common age to acquire a concussion/brain injury is ages 15-24.

Football players who have had a concussion are three to six times more likely to have an additional concussion compared to those who have not had a concussion.

After a first brain injury, the risk of acquiring a second brain injury is three times greater. After a second brain injury, the risk of acquiring a third brain injury is eight times greater.

Conclusion

There are many ways to actively participate in your community by supporting brain injury prevention, awareness, support, and legislative change. **The Cognitive FX Foundation is committed to spreading awareness and assisting in active research, treatment, and community engagement to advance the state of brain injury care.**

Find out more ways to
be involved at **cognitivefx.org**

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