



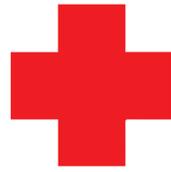
Traumatic Brain Injury: Educational Materials



#3

IMPORTANT:

If you are experiencing a medical emergency, please call 911 or present to your nearest emergency room for evaluation and treatment.



You should go to the nearest emergency room if the following conditions are present:

- ANY periods of loss of consciousness
- Unable to wake up
- Experiencing double vision or loss of sight
- A weakness or burning in your arms or legs
- A severe headache or one that progressively gets worse
- Any kind of seizure or convulsion
- Bad nausea or excessive vomiting
- Unsteadiness while walking or standing
- Any bruising around your eyes or ears
- Slurred speech
- If you become confused or exhibit odd behavior



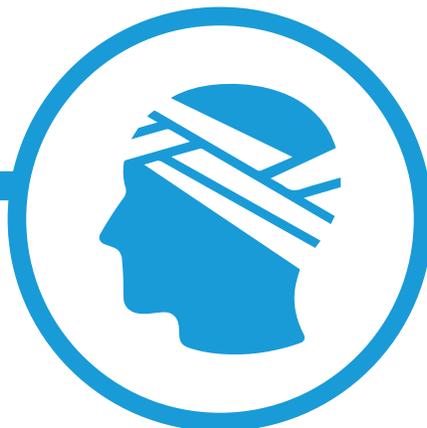
Please Protect Yourself From Re-Injury!

In section 2 of this educational material, we stressed the importance of preventing a re-injury to your brain! These concerns still apply as your brain is continuing to heal from the initial trauma. **Second Impact Syndrome** (SIS) occurs when two traumatic brain injuries (concussions) happen in a relatively short period of time AND the second concussion is inflicted BEFORE the first one has fully healed. This can cause rapid and severe swelling, and the brain may lose its ability to self-regulate pressure and blood volume. As the brain swells, it can press against the skull resulting in decreased blood flow. When the blood flow is disrupted, it can cause severe disability or even death.

It is suggested that you try and avoid any unnecessary movement of your head and neck - especially any quick motions. You do not want your brain jostling around inside your skull!

Some people that have suffered a TBI find that they are sensitive to bright lights. You may want to put on sunglasses when you are out of the home or driving. You should also reduce the amount of time you spend looking at a computer monitor, a laptop, iPad, smart phone, or the television. If you find it difficult to get to sleep at night, a wise practice (even when not suffering from a TBI) is to unplug from the screen at least two hours before going to sleep.

Bottom line: Please be careful with all that you do - at home or when you are out and about.



Diet



It is our hope you have implemented the dietary recommendations that you were given in section 2 of this educational material. Your brain requires proper nutrition to keep it working at its peak, and this is especially true after a traumatic injury. Your body and your brain also need vital nutrients to recover from your injury. One way to help insure you are getting enough food/fuel is to try and eat smaller meals more frequently. If you are on the go, pack healthy snacks to take with you to eat throughout the day. You should avoid dumping large amounts of food into your stomach for digestion as it will flood your system with a surge of nutrients. Your brain may not be able to handle those large swings of nutrients flowing into it over a shortened period of time. It is also important to note that fasting is typically not ideal for patients with TBI's, and in fact, may even be detrimental - especially if you are taking medications that should be ingested with food.

Our advice about drinking enough water throughout the day bears repeating as this is the **MOST** important recommendation. It is easy to get dehydrated, especially in warm temperatures. Water helps your body digest foods and absorb other nutrients. Consuming water will also help your body to regulate your temperature better and increase circulation.



How do you calculate the amount of water your body needs?

Take your body weight.
Divide by 2.

That is the approximate total of how much water you need to drink each day. But keep in mind, if you are in warmer temperatures and in an environment where you sweat more, you will need to increase your water consumption.

For example: Body Weight: 160 pounds

Divide by 2

Your goal: 80 ounces of water

Now if you have pre-existing medical conditions, you should check with your health care provider and ask what they would recommend your daily water intake should be. Some of our patients may need to drink less water throughout the day.



The Importance of Exercise In Your Recovery



As a reminder, another important element to the healing process is getting a good night's sleep. It is important to have at least 8 hours of restful sleep each night. Studies have shown that the darker the room and/or the cooler the temperature, the better the quality of sleep you will get. But you should not lay in bed all day as this can do more harm than good. At some point, you will want to gradually start increasing your daily activities as your body and brain can tolerate it. Regular exercise can improve your metabolism which will make it easier for your body to receive and absorb the nutrients it needs from meals. Exercise will also help proper blood flow to the brain and can alleviate some of the symptoms you are experiencing. But again - we must be cautious when trying to incorporate exercise into your routine. Before attempting any exercise or moderately strenuous activity, please FIRST consult with your treating physician to see if this is appropriate for you at this time.

You may have several factors that can work against you as you try to start an exercise regimen:

- Fatigue. You may just feel too tired to do anything.
- Pain. Headaches before, during, and after exercise may be a barrier you feel you can't push through.
- Weight gain or other physical injuries may prevent or limit your activity level.
- Depression and lack of motivation. You may not have the desire to do anything.

Fight these barriers to exercise! Talk with your doctor and find something safe that you can do if you fear re-injury or aggravation of your symptoms.



Why is exercise AFTER a Concussion so important to the recovery process?



Exercise in general can help prevent major health problems like cardiovascular disease, obesity, or diabetes. Staying active can also lower your blood pressure and improve overall mental and emotional health. But aerobic exercise can help facilitate better brain functioning by increasing blood flow to the brain which gives it the oxygen it needs. Aerobic simply means “with oxygen.” Aerobic exercise is simply cardiovascular conditioning like brisk walking, swimming, jogging or cycling. This type of exercise can also cause the brain to produce chemicals which can stimulate cell growth and improve neuroplasticity (forming NEW connections within the brain to allow regrowth/repair). Under normal, healthy circumstances, the American Heart Association recommends 150 minutes per week of moderate intensity aerobic activity or 75 minutes of vigorous intensity exercise.

Studies have shown that every time you exercise, your body will produce a protein called “Brain-Derived Neurotrophic Factor”, or BDNF. This protein promotes the regrowth/repair of neurons which improves communication within the brain. This boost can continue for several hours after exercise which is important in healing trauma to the brain.

In the past, most doctors would recommend that their patients who sustained a TBI should not exercise and should refrain from all mental and physical activities until the concussion symptoms disappeared completely. However, it was discovered that this period of inactivity could last from several days to several months as the concussion symptoms still lingered. The “cocooning” or to use a phrase from the Covid pandemic - the “sheltering in place” - actually led to an increase in depression and anxiety for the patients and it slowed their overall recovery time. The most recent studies have shown that when a patient rests for more than 2 days, this period of inactivity can actually lead to worse outcomes. Sadly, a lot of health care practitioners are not aware of the newest research and they continue to tell their patients that the only treatment they need is rest. This is just not supported by science.



So what is the right exercise after a TBI?

Again, the starting point for the answer to this question begins with you and your treating physician. There are so many factors, including pre-existing disease processes or other injuries which might make exercise risky or even dangerous in some situations. And you should not leave common sense out of the decision process as you do not want to engage in any physical activity which could increase your risk of re-injury. These activities could include contact sports like karate, jiu-jitsu, or boxing. Also, any activity which could cause your head or body to be jolted or impacted should be avoided, such as running or jumping rope.

The best approach is to start slow and see what you are capable of doing that can elevate your heart rate without increasing your symptoms. Walk before you run! Try riding a stationary bike, or working out in a pool or walking around your neighborhood while enjoying some fresh air. If your body starts to tell you “OW, that hurts”, then stop the activity. You may have pushed yourself too far too soon so you will need to reduce the level next time. But make sure there is a next time. You may be able to tolerate only 10 minutes, but that 10 minutes of aerobic work can help boost brain functioning and healing. Maybe the next time you can do 11 minutes, and then 12 minutes as you slowly increase your ability to perform.

It is also a good idea to create an exercise plan for your week so you can mentally prepare for the exercise activity. For example:

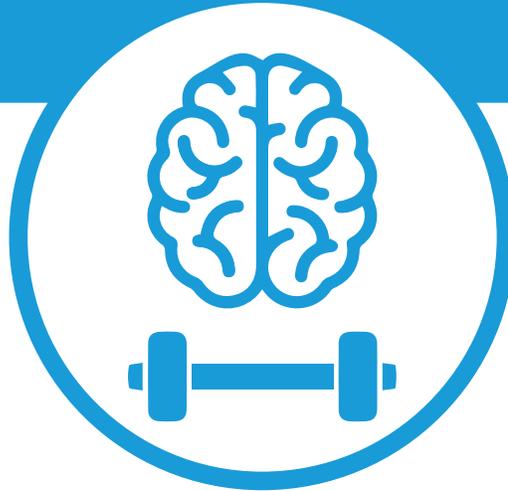
Monday, Wednesday & Friday:
Tuesday, Thursday, Saturday:
Sunday:

Walk around your neighborhood.
Ride an exercise bike
Rest!

MON	TUE	WED	THU	FRI	SAT	SUN
						



What can you do to “exercise” your brain?



One consequence from a TBI is swelling/inflammation of the brain. Because of this inflammation, your brain may not be able to use certain communication pathways like it normally would. For most patients, these pathways will begin to work after a couple of weeks. But for some, there are delays and the brain may need to generate “new” pathways for this communication to flow. This innate healing ability in your brain is known as “neuroplasticity.” Cognitive exercises can help retrain your brain “muscles” to re-establish connections or re-route connections that may have stopped working because of your TBI.

On the following pages, please find a series of “brain games” you can play to help exercise the brain.



Playing Card Sorting Exercise



Take a deck of cards and remove the Jokers (and other non-suit information cards that may be put in the pack.) Pick one card from each suit and place it face down in its own space. When done, you will have four cards face down next to each other, with one Spade, one Heart, One Diamond, and one Club. Now remember which card is in which stack. Shuffle the remaining cards and place them face down. Draw the top card from the deck. If it is a heart, place it on top of the heart stack you have started. Then draw the next card. If it is a club, place it on the club stack. Try not to look at any of the cards you started the stacks with initially as you are trying to place them correctly from memory. When you have gone through the shuffled stack, you should have one group of cards that are all hearts, one all clubs, one all diamonds, and the final one all spades.

The first few times you do this exercise, do not time yourself and do not be discouraged. You may make some mistakes, but that is ok. As with all exercises, you are going to build up stamina and you will get better at it over time. After a few days of doing this, start timing yourself. Also, keep track of how many cards were mis-placed. The goal is to perform the exercise quickly without any mistakes.



Word Puzzles

Any kind of game where you must find a specific list of words within the puzzle:

BIRTHDAY WORD SEARCH

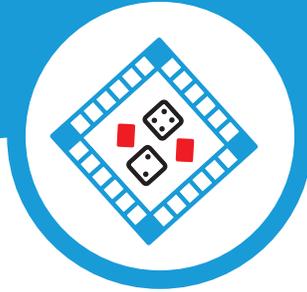
Find all the hidden words!
Words can bend at 90 degrees in any direction.
Each letter is used only once.

AGE	CARD	FUN	MUSIC
BALLOONS	CELEBRATION	GIFTS	PARTY
BIRTHDAY	DECORATIONS	GUESTS	PRESENTS
CAKE	FESTIVE	HAPPY	WISHES
CANDLES	FRIENDS	LAUGH	YAY

C	P	S	C	I	S	E	G	A	Y	S
A	R	T	N	Y	U	L	O	O	P	D
K	E	S	E	T	M	L	S	N	P	N
E	N	P	A	R	B	A	D	H	A	E
F	U	D	E	C	C	A	R	F	R	I
D	N	A	C	O	R	A	T	N	S	C
L	E	S	G	I	F	T	I	O	L	E
R	I	B	E	V	I	S	F	B	E	Y
T	H	D	A	Y	T	S	E	R	Y	A
A	L	W	I	N	O	I	T	A	S	T
U	G	H	S	H	E	S	G	U	E	S



Board Games



BOGGLE is a game you can purchase. You have 16 wooden blocks with letters on them. You roll the blocks, and then place the letters in the tray in any random order. When done, you will try to find as many words as possible that you can make out of the letters. After a few times, you can use the timer included in the game to further increase the difficulty of the game. You can either play this game on your own or with friends.

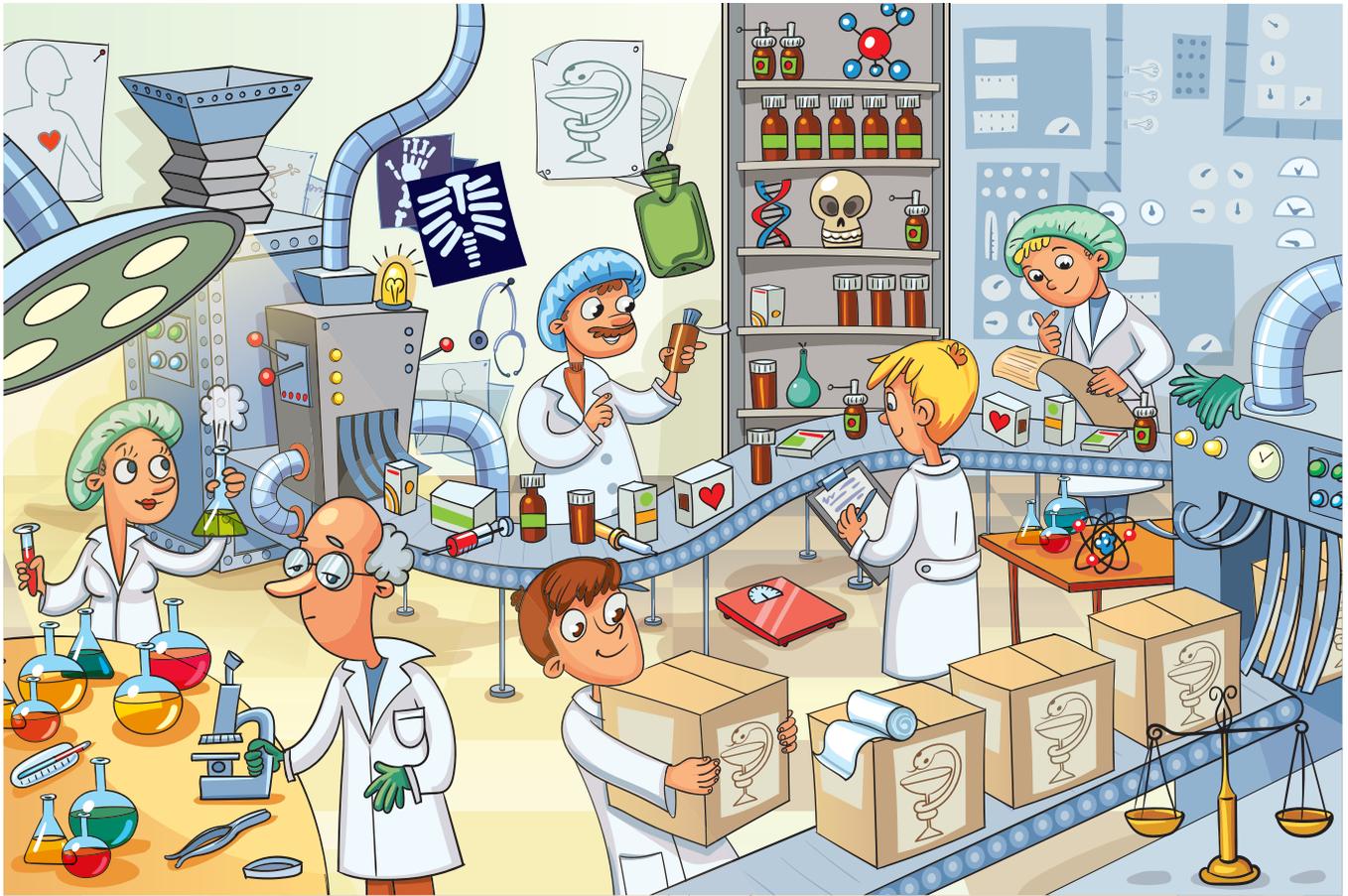
SCRABBLE is a board game you can play with two to four friends. You will take 7 tiles and then try to play words on the game board. The next player will then attempt to use any of their tiles to play a word that touches the tiles on the board. Letters are assigned a certain value, and you add the value of each of the letters played to get your total word score. Whoever has the highest total score at the end wins the game.

CONNECT FOUR is a strategy game where players try to form a line of four disks of one color.



Picture Games

Find an Object



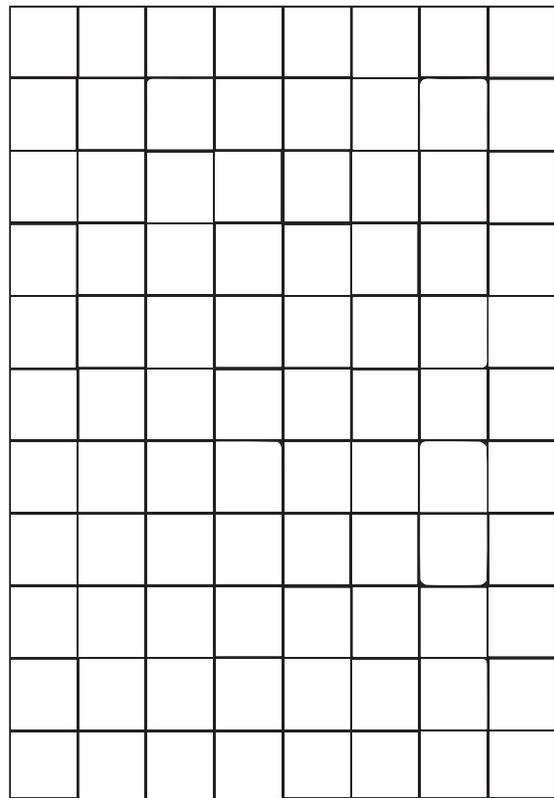
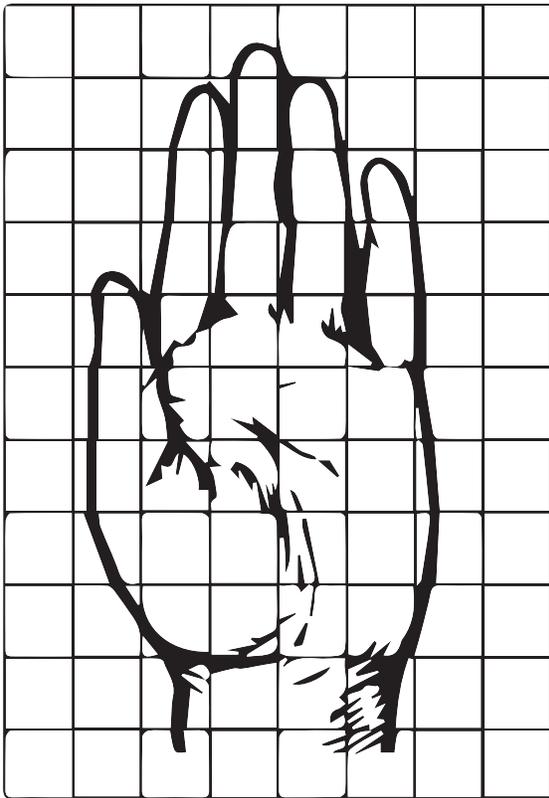
Find 15 objects in the picture



#3

Picture Games

Try to **DRAW** an object:



Using the object on the left as a guide, try to draw the hand here.



Puzzles

Puzzles:

Start off with an easy puzzle of no more than 50 pieces. When complete, try to put the puzzle together using a timer to challenge yourself. When complete, do it again and see if you can beat your previous time. You can slowly graduate to more difficult puzzles with more pieces as your condition allows.



Some Final Notes

- DO NOT play sports until released by your healthcare provider. Further, we have covered a lot of information regarding the importance of physical exercise in your recovery. However, please do not exercise unless it has been approved by your treating physician.
- DO NOT drive unless it has been approved by your treating physician. This is especially important if you have been prescribed any medication.
- Some of your symptoms may come and go throughout your recovery. Unless they are in the DANGER category, you can expect some good days and bad days. Most people will take several weeks before they feel back to “normal.” However, your return to “normal” activities may cause your symptoms to return. Please don’t overdo it and notify your treating physician regarding your condition with recurring symptoms.
- Please try and incorporate Cognitive Exercises into your daily routine. These games/puzzles can help retrain your brain “muscles” to re-establish connections or re-route connections that may have stopped working because of your TBI.

Our next educational materials will deal with return to work/school issues.

