The Study of Cognitive Rehabilitation Effectiveness

The SCORE clinical trial is a randomized controlled treatment trial evaluating the effectiveness of cognitive rehabilitation in post-deployment military service members who sustained a concussion

Chapter 2: Psychoeducational Interventions for Persistent Post-Concussion Symptoms Following Combat-Related Mild Traumatic Brain Injury

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Congress established DVBIC in 1992 after the first Gulf War in response to the need to treat service members with TBI. DVBIC's staff serves as the Defense Department's primary TBI subject matter experts. DVBIC is part of the U.S. Military Health System and is the TBI operational component of the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (DCoE). Learn more about DVBIC at dvbic.dcoe.mil.

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SCORE Disclaimer

Chapter 2:
Psychoeducational Interventions for Persistent Post-Concussion Symptoms Following Combat-Related Mild Traumatic Brain Injury

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1. Overview and Review of the Literature

Research shows the benefit of brief psychoeducational interventions for significantly reducing the severity and duration of post-concussion symptoms (PCS) in the acute phase following a mild traumatic brain injury (mTBI). Three studies with prospective recruitment within one week of injury[1-3] demonstrate significantly reduced PCS at follow-up secondary to educational interventions.

These studies all involve interventions that were psychoeducational in nature (e.g., providing an informational booklet that outlined common symptoms, as well as their likely time course and suggested coping strategies) with a varying degree of additional support. Mittenberg et al demonstrated that a psychoeducational intervention, which included giving clients a printed manual and having them meet with a therapist for 1 hour prior to hospital discharge, resulted in significantly shorter symptom duration and significantly fewer symptoms at 6 months, compared to a matched control group that received routine hospital care.[1,4] The educational information included the nature and incidence of expected symptoms, a cognitive-behavioral model of symptom maintenance and treatment, symptom-specific strategies, and instructions for gradual resumption of activities.

There is a dearth of research on interventions administered during the post-acute to chronic stages. Differences between interventions, samples studied, and methodologies make comparisons difficult. Paniak et al., in their randomized controlled trial in the post-acute phase, found there was no added benefit in providing more extensive treatment (as is typically provided following more severe TBI) when compared to a single informational meeting during which patients' post-TBI experiences were legitimized, education was provided about common symptoms and coping strategies, and reassurance of positive outcomes was provided.[5,6]

Given the present literature, whether patients seen more chronically (i.e., months or more post-injury) can benefit from brief psychoeducation is unknown. Positive results to date have involved much more intensive interventions than the studies conducted on patients evaluated soon after injury.[7, 8]

Post-concussion symptoms, particularly in the chronic phase, are not specific to TBI. However, people may nonetheless attribute their current symptoms and difficulties to having sustained a brain injury. Therefore, an important aspect of intervening in the chronic phase is re-aligning attributions,

that is, the extent to which one attributes symptoms to mTBI versus other potential causes. Indeed, Larson and colleagues reported that attribution to mTBI was associated with more severe PCS reporting in their sample of veterans.[9] Similarly, Belanger et al. found that the most potent predictor of PCS severity was attribution.[10] Importantly, work in other specialties suggests that attributional styles are mutable and can be modified.[11]

One trial showed no effect of psychoeducation in the chronic phase, at least in a web-based, self-paced informational format.[12] However, this study was unable to determine whether similar in-person educational interventions would be beneficial.

Application of psychoeducational interventions in SCORE trial

For the Study of Cognitive Rehabilitation Effectiveness (SCORE) trial, a manual was adapted from Mittenberg et al.'s work with additional content added to address military-specific issues (e.g., content on post-deployment adjustment, posttraumatic stress disorder, etc.).[1, 4]

Healthcare providers (e.g., physician, nurse practitioner or physician assistant) used the written material within the context of a general rehabilitation program designed to promote positive expectation of recovery. The manual provides information about typical symptoms following mTBI, attributions of symptoms, strategies for managing specific symptoms, encouragement to seek treatment for mental health issues, as well as positive expectancy for recovery.

Following enrollment in the SCORE trial, the healthcare provider spent at least 30 minutes reviewing the written materials, answering questions, and educating subjects. The psychoeducational intervention was completed with every subject enrolled in the SCORE trial, regardless of treatment arm, consistent with the Departments of Veterans Affairs (VA) and Defense (DoD) Clinical Practice Guideline for the Management of Concussion/MTBI.[13]

Section 2 provides the client's guide to recovery following concussion. The information was made available to clients during the SCORE trial.

2. Persistent Symptoms Following Concussion: A Client's Guide to Recovery[1]

Concussion or Mild Traumatic Brain Injury

The news media has reported over the past several years about blast concussions sustained by service members during deployment to the Iraq and Afghanistan wars. The frequency of concussions during professional sports events also has received recent media attention.

What you may not know is that the majority of concussions experienced by service members occur in the garrison setting. Fortunately, your health care team knows a lot about concussions.

What Is A Concussion?

A concussion is the same thing as a mild TBI. Specifically, it's a blow or force to the head that causes loss of consciousness lasting less than 30 minutes, or an alteration in consciousness. In other words, you had a concussion if you were "knocked out" for less than 30 minutes or if you were not knocked out at all but were briefly confused or dazed. We will use the term concussion here because most people are familiar with that term.

Being hit in the head can cause memory loss for the time before, during and/or immediately after the injury. For example, it is not uncommon for soldiers to report that they remember "waking up" and feeling confused in the aftermath of an explosion but don't remember the explosion itself or the events immediately before or after it. Some people think that, in order to be recovered, they need to remember these events. This is not true. In fact, that may never happen, because when you are knocked out or experience a brief period of amnesia for the event, your brain cannot form new memories.

What can I expect after a concussion?

People tend to get better after concussions, but most will have some temporary symptoms. A hit to the brain is never a good thing. Eight out of 10 people with a concussion show some symptoms during the first days to weeks after their injury.

Some symptoms after a concussion, like confusion, will resolve quickly. Post-injury headaches and slowed thinking may take a little longer to get better. People are different, and no two injuries are exactly the same.

In most cases, there are no lasting symptoms or ill effects from the concussion itself. This is because the brain is surrounded by shock absorbing liquid and covered by the skull. Often these are enough

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[1] This Section 2 material was prepared by the James A. Haley VA Hospital with support from HSR&D (project #SHP 08-189) and from the American Psychological Association, Division 40. It was adapted from: Mittenberg, Zielinski, & Fichera, (1993). The materials were further adapted by the SCORE trial research staff at Brooke Army Medical Center with permission by the authors (Belanger; Kretzmer, Vanderploeg).

to protect the brain from any damage. Even if a person has initial symptoms in the hours or days after a concussion, most people recover completely. In fact, most individuals who suffer a concussion experience few post-injury problems and make a rapid recovery, often returning to normal within hours or days after their injury. Any injury to the brain will heal and get better, not worse, over time.

Remember that ***symptoms are part of the normal recovery process*** and are not signs of permanent brain damage or medical complications. Just as scratches or wounds itch while they heal, these symptoms are expected as your brain heals.

Also remember that you, at times, had many of these symptoms before your concussion – headaches, memory lapses, and irritability. Therefore, some of your symptoms now likely have nothing to do with your injury. See Table 3.1 for a list of things people normally may forget.

Table 3.1. Things We Normally Forget

Symptom	Percentage of People Who Forget
Telephone numbers	58
People's names	48
Where car was parked	32
Where the car keys are	31
Groceries	28
Why they entered a room	27
Directions	24
Appointment dates	20
Store locations and shopping center	20
Location of items around the house	17
Location of wallet or pocketbook	17
Content of daily conversations	17

The symptoms listed in Table 3.2 are more common after a concussion. This table shows the percentage of individuals who have a concussion and have these symptoms, as well as the percentage of people ***without a concussion*** who have the symptoms.

Table 3.2. Most Common Symptoms of Concussion Compared to Symptoms of Everyday Stress

Symptom	Percentage of Individuals with Concussion	Percentage of Individuals without Concussion
Poor concentration	71	14
Irritability	66	16
Tired a lot more	64	13
Depression	63	20
Memory problems	59	20
Headaches	59	13
Anxiety	58	24
Trouble thinking	57	6
Dizziness	52	7

Symptom	Percentage of Individuals with Concussion	Percentage of Individuals without Concussion
Blurry or double vision	45	8
Sensitivity to bright light	40	14

If I had a concussion, how long will the symptoms last?

Fortunately, we have learned a lot about concussion over the years. After most concussions, recovery happens quickly, within days to weeks. For example, you've seen athletes who recover very quickly following a concussion.

One thing we have learned about concussions is that the condition of the brain at the time of the concussion also determines how long it takes to recover. The typical athlete who receives a concussion during a game is well fed, hydrated and well-rested. Think about the circumstances and your own physical well-being at the time of your concussion. Were you tired, hungry, stressed, feeling unwell? All of these factors can produce more symptoms and cause them to last longer.

Also, if you have had previous concussions, you may take longer to recover. Doctors are still trying to figure out the effects of multiple concussions on recovery.

If I was hurt in combat, is my concussion different?

The short answer is "No." An injury to the brain is an injury to the brain, regardless of how it happened or where it occurred. However, there are several factors that make military service very relevant to understanding symptoms following a brain injury.

Many of the symptoms that occur following a concussion are the same types associated with prolonged exposure to high levels of stress. In addition, if you served in a war zone, you may be experiencing difficulty readjusting to life in the civilian community. Most of these difficulties are normal reactions to abnormal conditions. For example, you are used to being on high alert and then, when you return home, many of the behaviors that were advantageous in a war zone are problematic stateside.

Adjustment can be difficult, because life has gone on without you. Perhaps your personal relationships have suffered due to your absence. If you are in the Guard or Reserve, your co-workers may have been promoted in your absence, or you may have lost your job altogether. You may have financial burdens. You likely miss the people from your unit and the sense of a "shared mission."

Given these factors, that you may be having difficulties is no surprise. Stress related to deployment (even with no physical injury to the brain at all) has been shown to adversely affect the ability to pay attention and remember information. Although noticeable to you, the overall effect of stress on these abilities is relatively small and temporary. There is also greater likelihood of prolonged bad mood (irritability, depression and anxiety). However, as stress levels go down, your ability to pay attention and remember information will improve.

After the excitement of returning home fades, you may notice difficulties in dealing with life's changes. As a result, you may find that you are engaging in the following as a way to cope:

- Isolating yourself
- Feeling numb or indifferent
- Becoming passive, feeling helpless or not in control of your life
- Acting out, engaging in risky behaviors
- Using alcohol or drugs in excess (perhaps to sleep or numb out)
- Shutting down or zoning out
- Blaming others for the difficulties you are experiencing
- Being more irritable, easily annoyed or less patient

These symptoms are more associated with readjusting back home and are actually common after returning from a combat zone. These difficulties can be compounded by the following:

- Posttraumatic Stress Disorder (PTSD)
- Depression
- Concussions
- Ringing in ears
- Hearing problems
- Body aches & pain
- Sleep problems
- Headaches

Maintaining your social support system and seeking whatever help you need to readjust to civilian life are important, especially while readjusting to life stateside. Just as you needed extensive training on how to function and survive in a combat zone, you will need to re-train yourself on how to function outside the combat zone. Remember that, if you sustained a concussion or mild TBI, you are recovering from two conditions: concussion and post-deployment difficulties. Symptoms from both conditions overlap each other and can actually make you feel worse.

You served our country. Now get the help you deserve.

What Can I Do About The Symptoms, Whether They Are Stress-Related or Concussion-Related?

Some people find that, at first, it is hard to do their daily activities, their job, get along at home, or relax. The best way to deal with this is to gradually resume activities and responsibilities, a little at a time. Structure the time you spend at work, getting together socially, or exercising based on your energy and comfort levels. The most important thing you can do to help your recovery is to **pace**

yourself, and **get all the rest you need**. This is not the time to "tough it out." In fact, if you find your symptoms getting worse or you notice new symptoms, this is a sign that you are pushing yourself too hard. **Slow down!**

Ignoring your symptoms and trying to "push through" often make the symptoms worse. Symptoms are your body's way of giving you information. A broken bone or a torn muscle hurts so that you won't use it, and it has time to heal. Symptoms are your brain's way of telling you that you need to give it rest. Most doctors who treat concussions agree that recovery is faster when the person gets enough rest and resumes responsibilities gradually.

Scientific studies show that even 1 week of relaxing at home, followed by a week of gradually increasing activity after your injury is best for most people who had a concussion. Most individuals who took this advice were back to normal at work or school in 3 to 4 weeks. In contrast, most of the people who "pushed through" took as long as 5 to 12 weeks to get back to their normal routine. These individuals also had more symptoms, especially irritability, trouble concentrating, and memory problems than those who returned to their routines gradually. In a war zone, getting the needed amount of rest after an injury can be difficult. When you return home, get the sleep you need. Avoid late-day caffeine and energy drinks that will interfere with sleep.

Thinking and worrying about your symptoms can make them seem worse. This is partly because paying attention to a feeling seems to magnify or increase it. If you pay attention to your heartbeat or breathing for a minute or two, you will see that the sensations seem to become more noticeable. Focusing on the symptoms of your injury also make them more noticeable. Doing relaxing things you enjoy will help keep you from over-focusing on your symptoms.

These symptoms are a normal part of recovery and will eventually go away on their own. Of course, we all have some of these symptoms once in a while. After a concussion, it can be easy to forget that we were sometimes irritable, tired, had headaches, couldn't concentrate, or forgetful even before the injury. **Many symptoms of concussion are similar to symptoms of stress. Try to deal with these things the same way you did before.**

The injury itself, being evaluated and treated and going back to work or school are all things that add stress to most people's lives. Bills can pile up, time is lost, and there may be injuries to other parts to your body. And just like a pulled muscle or a bruised leg, your brain takes time to recover. Readjusting to day-to-day life, including work or school can be challenging at first, particularly when returning from a combat zone. And while this is normal, it can be stressful. Trying to do your regular work right after a concussion is something like trying to play baseball or swim with a pulled muscle. Even though you can't see the injury and it isn't really serious, it will still take time to get better. **Be patient!**

Another important thing you can do is **avoid alcohol and drugs.** People who overuse alcohol or drugs will have a slower and poorer recovery from concussion. Don't do it!

Finally, people with mood problems may recover more slowly because the symptoms they are having may be mood-related. Symptoms of depression and anxiety can be exactly the same as symptoms of concussion. People who are depressed have memory and concentration problems, for example.

People, particularly those with military backgrounds, often have trouble admitting they need help or have mood-related (behavioral health) difficulties. In fact, it may be preferable to think that all of your current difficulties are the result of a head injury rather than due to psychological issues.

Here is the tragedy of that strategy: **Behavioral health disorders are treatable!** If you have mood difficulties (like depression or anxiety), get treatment. Some people think that seeking help is weak, but, if you develop mental health symptoms due to fighting an enemy that was trying to kill you, you are normal! If you develop mental health symptoms because you are questioning the purpose of life, because you lost someone you love, because you saw disturbing things, because your family does not understand you, because you miss your family, or even for no reason you can name, realize that this is common. You would seek help for a broken leg, and seeking help for these mood issues should be no different.

Points to remember:

- Symptoms of concussion can be the same as the symptoms of stress.
- Things to do to help recover include avoiding alcohol/drugs, maintaining relationships with friends and family, pacing oneself, and seeking help for mood-related difficulties.
- **If you have been diagnosed with PTSD, depression, or some other mood condition, seek treatment.** Many of the symptoms of these conditions are similar to the symptoms of TBI. Treatment of your mood will help alleviate concentration and memory problems.

Things I can do to speed recovery:

- Avoid alcohol or drugs
- Make a real effort to keep friends and family around for support
- Avoid energy drinks
- Get enough sleep
- Get help for mood problems
- Avoid getting re-injured
- Allow myself time to relax and heal
- Know that I will get better

Management of Specific Symptoms

Research shows that the single most important factor in recovery is that you know what to expect and what to do about symptoms. The following techniques are helpful in managing your symptoms. Read those symptoms that are troubling you; you will find some practical ways that may help.

Poor concentration

The main cause of poor concentration is being tired. When it becomes difficult to concentrate on what you are doing, take a break and relax. Even a 15- to 30-minute period of rest would be helpful. If you still continue to have problems, then you should temporarily shorten your work day, class schedule, or daily routine. Trying to "stick it out" won't help; in fact, it will usually make things worse by making your brain more tired more quickly.

Another way to help with poor concentration is to limit the number of distractions in your environment. For example, turn down the radio, work where it's quiet and try not to do too many things at once. Writing while you talk on the phone or taking notes as you listen to someone talk are examples of doing two things at the same time. Having a concussion will initially make it difficult to concentrate on more than one thing. However, over time and with plenty of rest, your ability to concentrate will improve.

Irritability/anger

Being irritable happens to everyone from time to time. It becomes a problem only when it interferes with your ability to get along with people every day. If you find yourself getting into arguments that cause trouble at home or at work, it is time to deal with it**.**

Factors that can make anger or irritability worse include fatigue, use of alcohol or drugs, or pain

People lose their tempers more easily when they are tired, overworked, drinking or in pain. If you notice that you are becoming more irritable, you should adjust your schedule, get more rest, and deal with other factors that might be making you more irritable.

Thoughts often make us angrier than what actually happened. You can see this for yourself by imagining an irritating situation and why it would make you angry. There is usually a reason why irritating things happen. When something makes you angry, ask yourself what caused it. Family, friends, or coworkers can do things that bother us at times.

Stewing about it can make the situation worse

Problems can be solved better if you stay calm and explain your point of view. The steps you need to take to solve a problem will be the same when you are calm as they would be if you were irritated. Try to remind yourself of this when you find yourself becoming irritable.

Once calm, you usually can come up with several ways to solve a problem. Try to think of at least three different ways, write them down, and then decide which is best. Just realizing that there are several things you can do to solve a problem will make it a lot less irritating.

Anger is a normal and even healthy emotion, but learning how to deal with it in a positive way is important. Uncontrolled anger can make both you and other people feel lousy. Everyone gets angry from time to time, often with good reason. Outright anger is a feeling that should be recognized, because it could be a start of something deeper, like rage or violent actions. Anger should be controlled; otherwise, it has the ability to control you. Anger is best recognized and controlled when it is understood.

Often, when someone gets angry, it is because they are thinking about things in a certain way. You can control your emotions by controlling your thoughts.

Here's an example: Mark is driving down the highway when a car pulls in front of him with very little room to spare. In other words, Mark has been cut off. He becomes furious and wants to step on the gas pedal and tailgate the car to "teach them a lesson." What is Mark thinking, probably without even being aware of it, that makes him so angry?

Let's think about this:

First, Mark may be assuming that the other driver is deliberately doing this to him. That would make anyone angry. However, it is far more likely that it was done without spite. The person may be in a hurry, with no regard for safety because someone they love is in the emergency room at the hospital. Or, it may be a teenager who has not yet learned how to drive very well, or an elderly person who cannot see very well.

Second, Mark is thinking that the other person is a terrible driver and needs to be taught how to drive. This may well be true. However, tailgating the person will not teach them anything and is potentially life-threatening.

Regardless of the cause, in this example, Mark must control his anger. His life could depend on it. In most instances, people should try to control their anger. If they control it, they can use it to their advantage.

For example, rather than yelling at your wife or husband (which will cause you problems and make them unhappy) when you feel angry, calm yourself down and express yourself. Learn to recognize when you begin to feel angry, and stop yourself from reacting right away. If you give yourself time, you can calm down more. Finally, decide what it is you really want to say (in other words, what you are really thinking?). Rather than calling someone a name when you are angry because they did not take out the trash, calm yourself, and tell them you are disappointed that they did not take out the trash. **You are more likely to get want you want if you express it in a controlled and respectful way.**

Sometimes using "I" statements (e.g., "I am disappointed that you didn't remember my birthday") can help when you're feeling hurt or angry. You are more likely to get your point across if you express it in a controlled way.

Some more tips to handle anger:

- Take a timeout
- Once you are calm, express your anger
- Think carefully before you say anything
- Use "I" statements when describing the problem
- Identify solutions to the situation
- Be more forgiving of other people
- Use humor to release tensions
- Practice relaxation skills: deep-breathing exercises, visualizing a relaxing scene, listening to relaxing music, exercising, or repeating a calming word or phrase to yourself

Fatigue/sleep problems

Being more tired after a concussion is normal. The only sensible treatment for being tired is **rest**. Avoid wearing yourself out. Gradually increase your activity level. Most people have more energy in the morning than later in the day. If your symptoms get worse, this means that you are pushing yourself too hard.

For those returning from a war zone, experts say it takes several months to return to normal sleep. You initially may have trouble getting to sleep or staying asleep, maybe due to bad dreams. This is typical. Even if you are not having bad dreams, your body is still used to sleeping on military time in a combat zone. You have forgotten how to sleep like a civilian. Your fatigue also is made worse if you are having difficulties sleeping.

Fatigue levels will worsen if you are not able to consistently get 6 to 8 hours of sleep each night. As fatigue levels increase, mood, memory, concentration and pain will worsen.

Here are some strategies to help if you have sleep difficulties.

Personal habits:

- Establish a fixed bedtime and awakening time. Do not sleep in – even on weekends
- Avoid napping during the day
- Avoid alcohol, nicotine, and caffeine 4 to 6 hours before bedtime
- Avoid energy drinks
- Do not drink more than 1 to 2 caffeinated beverages per day
- Exercise regularly but not right before bed
- Think about something relaxing before bedtime, such as sleeping on a warm beach
- Create a pre-sleep ritual (taking a warm bath every night before you go to bed or reading for 20 minutes)
- Write down things that bother you during the day. If you can, talk to someone about things that bother you. This will help you "set aside" thoughts that may keep you awake
- Have a regular sleep schedule and stick to it

Environment:

- Block out all distracting noise
- Temperatures above 75 degrees Fahrenheit and below 54 degrees can disrupt sleep. A slightly cool room tends to contribute to good sleep
- Light regulates our biological clocks
  - If you find yourself struggling to fall asleep, try increasing your exposure to bright light during the morning
  - If you find yourself waking earlier than you'd like, try increasing your exposure to bright light in the evening
  - Avoid light if you wake up in the middle of the night to go to the bathroom
- Reserve the bed for sleep and sex. Do not do work, read, play video games or watch TV while in bed
- If you do not fall asleep within 15 to 30 minutes, get up and go into another room and read until sleepy

When you first make these changes, you may find that your **sleep gets worse initially** and that you are even more fatigued during the day; **this is normal**. **Being consistent with these strategies is the key to improving sleep and fatigue.**

While these techniques are helpful, in cases of PTSD, anxiety and/or depression, and if you are experiencing persistent nightmares, talk with your medical provider to discuss whether you would benefit from sleep medications.

Depression

When unpleasant things happen, most people become sad; to be sure, experiencing a concussion is unpleasant. In contrast, when good things happen to us, we feel good. An effective way to treat depression is to **make sure that good things happen.** One way to do this is to plan to do something enjoyable for yourself every day. Make your plan specific, and then stick to it. Decide on something you like and exactly when you're going to do it; that way, you can look forward to it. Anticipating and doing enjoyable things each day will improve your mood; for example, seeing friends and/or forming new relationships add to our emotional well-being.

Thoughts can make us depressed. Thinking that things are bad or terrible will do it. Situations are often not as terrible as they may seem at first. Think back to an unpleasant moment in your own life, and you will see that this is so.

Chances are that if you are depressed, you are telling yourself things that are depressing. Thinking that the situation is terrible, that there is no end to it in sight, that you are not able to do anything about it, and that it is your fault are all depressing things to tell yourself. Thinking this way can become a habit if you do it often enough.

Usually, people tell themselves unpleasant things all the time out of habit, not because those things are really true. If you find yourself thinking depressing thoughts, **stop**. Simply stopping a depressing thought can make you feel better. One way to stop yourself is to see whether what you're telling yourself is really true. Another way to stop from dwelling on negative thoughts is to distract yourself: Read a book, listen to music, call a friend, go shopping, or exercise. Think of three things that you could do to distract yourself from your unpleasant thoughts.

Memory problems

Memory difficulties have several causes. The part of your brain that stores memories is called the temporal lobe. It may be bruised in a concussion. Some memory difficulties can be caused by the bruises, which is why you may not remember the injury incident very well. Like a black and blue mark on your arm or leg, these bruises will recover in time. Your memory will most likely improve as this happens.

If you can remember being injured, chances are that your brain was not bruised. Most of the memory problems people notice after a concussion are not caused by bruising, but rather due to poor concentration and being tired. For you to remember something, you have to pay attention to it first. If you do not concentrate long enough, the information is never stored in your memory. Concentration problems are a normal part of recovering from a concussion, and some memory trouble is a normal side effect of this.

You probably will be able to concentrate and remember better when you get enough rest. Memory problems can be a sign that you are pushing yourself to hard. Writing things down or using a pocket recorder are excellent ways of coping with temporary memory difficulties. They will help recovery and not slow it down.

Of course, nobody's memory is perfect anyway. After a concussion it can be easy to forget that we sometimes had trouble remembering things even before the injury. Some of the symptoms you notice actually may have nothing to do with your concussion.

Worrying about remembering things that you would normally forget can make your memory seem worse to you. If you can remember your memory problems, you probably don't have much of a

memory problem! People with serious memory difficulties are usually not upset by their symptoms. They don't remember that they have any memory trouble. If you are concerned about your memory, tell your health care provider.

Headaches

Headaches are part of the normal recovery process, but that doesn't make them any less bothersome. Headaches are another cause of irritability and concentration problems after a concussion. This guide cannot replace the medical advice that you should get if you are bothered by headaches. Headaches can have many causes, and your doctor will want to diagnose the problem and prescribe helpful medication if you need it.

Stress or tension is one of the most common causes of headache after a concussion. This is usually the cause when the headaches start for the first time several weeks after the injury. These headaches mean that you are trying to do too much. They probably will disappear if you take a break and relax. Your work day, class schedule, or daily routine should be temporarily shortened if you continue to have headaches.

Stress or worry causes tension headaches and increases muscle tension in your neck or forehead. These muscles can stay tight, without your realizing it, out of habit. They can become even tighter once the headache starts, because muscles automatically tense in reaction to pain. This muscle tension makes the headache worse.

If you have tension headaches, relaxing your muscles can help. It is not a good idea to do muscle relaxation exercises while you're actually having a headache. Wait until you are not having head pain, and then try progressive muscle relaxation. Start by clenching your hand as hard as you can. Harder. Notice how the muscle tension feels. Now relax your hand completely, and notice the difference.

Now clench both your hands as hard as you can and hold them that way for a moment or two before letting them relax completely. Notice the difference. Now, continue to tense and relax more muscle groups together by adding a different set each time. Face, chest, stomach, buttocks, feet. This method works best if you are lying on your back. Finally, tense all the muscles in your body at once as hard as you can, and then let them relax. At this point all your muscles will be very, very relaxed.

Progressive muscle relaxation can help prevent tension headaches by relaxing your muscles. This works best if you practice it once a day at about the same time for five minutes or so. This can help with anxiety and stress also.

RESCUE plan for headaches:

- **R**emain calm
- **E**scape from known triggers
- **S**tay away from stress
- **C**arry your headache medications with you
- **U**se relaxation exercises
- **E**at and sleep on schedule

See Table 3.3 for more help managing your headaches and Table 3.4 to learn about headache triggers.

Table 3.3. Managing Your Headache More Effectively

Component	Rationale	Benefits
Relaxation	Stress can trigger headaches. Muscle tension is the primary component of post traumatic headaches and a common trigger of migraine.	Positive physiological changes. Prevent onset of headache episodes. May reduce frequency of episodes. May help to cope with headache one it has started.
Trigger identification and avoidance	If you can identify environment and other stimuli that trigger headaches and make behavior changes to avoid them, you can reduce headache frequency.	Reduced headache frequency. Greater sense of control over headache condition.
Proper use of medication	Overuse of analgesics can lead to transformation chronic daily headache.	May prevent "rebound headaches" and gradual worsening of condition.
Exercise	Reduces muscle tension. Known to reduce headache frequency.	Improved cardiovascular health. Improved sense of well-being and self-concept. Decreased headache frequency. Decreased bodily pain.
Nutrition	Many foods may trigger headaches. Balanced diet contributes to overall health, which may reduce headache frequency.	Improved overall health and fitness. Improved sense of well-being and self-concept. Decreased headache frequency.
Sleep	Sleep disturbance is thought to contribute to headache frequency and intensity. Developing good sleep pattern is important for overall health and sense of well-being.	Decreased headache frequency and intensity. Improved sense of well-being.

Table 3.4. Common Headache Triggers

Dietary Triggers	
Caffeine	Coffee, tea, cola all can cause headaches. Decaf coffee and tea may be problematic, too.
Chocolate	White chocolate is okay. Carob is questionable.
Monosodium Glutamate (MSG)	Chinese food; soups; Accent® flavor enhancer and seasoned salt; flavored, salty snacks; croutons and breadcrumbs; gravies; ready-to-eat meals; processed meats; veggie burgers; low-fat and low-calorie foods
Processed Meats and Fish	Aged, canned, cured, fermented, marinated, smoked tenderized – or preserved with nitrites or nitrates: hotdogs; sausage; salami; pepperoni; bologna; liverwurst; beef jerky; certain hams; bacon pates; smoked or pickled fish; caviar; anchovies; fresh beef and chicken livers; wild game
Cheese and Other Dairy Products	The more aged the cheese, the worse it is. Permissible cheeses include cottage cheese, ricotta, cream cheese, and good-quality American cheese. Beware of cheese-containing foods like pizza. Yogurt, frozen yogurt, sour cream, and buttermilk are all possible triggers.
Nuts	Avoid all kinds, including nut butters. Seeds are okay.
Alcohol and Vinegar	Especially red wine, champagne, and dark or heavy drinks Vodka is best tolerated. Clear vinegar is allowable. Do not overdo condiments made with vinegar (e.g., ketchup, mustard, mayonnaise).
Certain Fruits and Juices	Citrus fruits and their juices, bananas, raisins, raspberries, red plums, papayas, passion fruit, figs, dates, avocados
Certain Vegetables	Especially onions Also, sauerkraut, pea pods, certain beans (broad Italian, lima, fava, navy, lentils) Leeks, scallions, shallots, spring onions, and garlic are all allowed.
Dietary Yeast-risen Baked Goods	Less than one day old: homemade/restaurant-baked breads (especially sourdough), as well as bagels, doughnuts, pizza dough, soft pretzels, coffee cake
Aspartame (NutraSweet)	Saccharin (Sweet 'n Low) also may be a trigger for some people. Sucralose (Splenda) is likely NOT a trigger.
Others?	Maybe soy products (especially if cultured, like Miso; fermented, like tempeh; or otherwise highly processed, like soy protein isolate/concentrate) Less risky are unflavored tofu and soy milk, and flour. Soy oil is safe. Possibly tomatoes and mushrooms. Anything else that may give you a headache.

Medication Triggers	
Hormones; Adrenaline-like Drugs, Stimulants, and Diet Pills; Vasodilators	Talk with your doctor to make sure your medications are not making your headaches worse.
Environmental Triggers	
Barometric Pressure	Changes in barometric pressure and weather patterns can trigger a headache in some people
Bright Lights	Being in the sun without sunglasses, or bright artificial lights, may trigger a headache.
Odors/Pollution	Smog, perfumes, and chemicals Flashing lights or screens (e.g., a computer)

Anxiety and post-deployment stress

Worry about symptoms and problems at work are the main causes of anxiety for most people. Anxiety should not be a problem for you if you understand that your symptoms are a normal part of recovery, get enough rest, and gradually increase responsibilities. Interacting with others, rather than isolation can be crucial.

If you are anxious, chances are that you are telling yourself things that are making you that way. Usually, when people worry all the time, it is out of habit, not because the things that they are telling themselves are really true. The steps you need to take to solve a problem will be the same when you are calm as they would be if you were anxious. If you find yourself thinking anxious thoughts, STOP. Simply stopping an anxious thought can make you feel better. See if what you are telling yourself is really true. Try relaxing your body and focusing on your breathing. This may help you relax.

It is very common for service members returning from deployment to experience stress related to their experiences. You may have experienced loss of comrades or witnessed terrible injuries. Some or most have felt the daily threat of injury or harm, and some have had to cope with the aftermath of traumatic situations. The experience of post-traumatic stress has a great deal of overlap with concussion symptoms. Following an emotional trauma, individuals may often feel dazed, numb, lost, or irritable. If these difficulties are interfering with your day-to-day functioning, you may have a condition called PTSD. Tell your medical providers about your experiences so they can help you get the right treatment and reduce the impact that PTSD has on general recovery. Effective treatments for PTSD can also work well for those who have suffered a concussion.

Trouble thinking

Problems thinking clearly or quickly are usually the direct result of other symptoms. For example, poor concentration, being tired, headaches, and anxiety can all make it hard to think clearly.

Dizziness, visual difficulties, and light sensitivity

If you are experiencing dizziness and/or visual changes, be sure to discuss these symptoms with your health care provider. For most people, these symptoms tend to disappear on their own within 1 to 3 months (or even less) of the initial injury. However, if you find these symptoms particularly troublesome, discuss them with your health care providers as they may want to have your dizziness evaluated or have you evaluated by optometry for eyeglasses.

You may notice some increased sensitivity to bright light or loud noise, particularly if you have headaches. This increase in sensitivity is normal after a concussion. Recent scientific studies show that someone's actual sensitivity to light and noise has nothing to do with how much light and noise bother them. So, in other words, paying attention to these symptoms will make them seem worse, because paying attention to feelings seems to magnify or increase it. Therefore, the less you think and worry about your symptoms, the faster they will usually go away.

3. Take-Home Points: Persistent Symptoms Following Concussion or Mild TBI

- **Remember!** Most people with a concussion will recover within hours to days following the injury. If you are over the age of 40 or have had multiple concussions, recovery may take longer. Co-occurring symptoms and conditions, such as sleep problems, combat stress, depression, substance abuse and pain, may affect cognitive abilities and other post-concussion symptoms and make them last longer.
- **People get better after a head injury, not worse.**
- **Know what to expect!** Scientific studies show that people who know what to expect recover faster and feel better during recovery than people who don't know what to expect. Symptoms from a concussion injury might include poor concentration, irritability, tiredness, depression, memory problems, headaches, anxiety, trouble thinking, dizziness, blurry or double vision, and sensitivity to bright light.
- **Get enough sleep!** The key to recovery is to be sure to get enough rest and resume responsibilities gradually. A lack of sleep can make symptoms much worse.
- **Protect yourself** from further blows or jolts to the head while you are healing. Avoid alcohol and drugs.
- **Can't remember things?** Write them down, use a daily planner or use applications on your smart phone.
- **Distracted?** Try doing one thing at a time; make sure your environment is quiet and non-distracting (turn off the radio or TV).
- **Be patient!**

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Appendix A: Acronyms

mTBI	mild traumatic brain injury
PCS	post-concussion symptoms
PTSD	Posttraumatic Stress Disorder
SCORE	Study of Cognitive Rehabilitation Effectiveness
TBI	traumatic brain injury
VA	Department of Veterans Affairs/Veterans Administration

Appendix B: Resources

Defense and Veterans Brain Injury Center, http://dvbic.dcoe.mil/ 1-800-870-9244

Brain Injury Association of America, http://www.biausa.org/ 703-761-0750

National Brain Injury Information Center (Brain Injury Information Only) 1-800-444-6443

Center for Disease Control and Prevention, http://www.cdc.gov/ncipc/factsheets/tbi.htm , 800-CDC-INFO (800-232-4636)

National Center for PTSD, http://www.ptsd.va.gov

"Wheels Down: Adjusting to Life After Deployment" © 2011. Practical advice written by military psychologists Bret A. Moore and Carrie H. Kennedy.
http://www.apa.org/pubs/books/4441014.aspx