



**TBI Management in the Deployed Environment: The Concussion Care Center Model**  
Date/Time: Feb. 13, 2014; 1-2:30 p.m. (EST)

Good afternoon and thank you for standing by. At this time, all participants are on listen only for the duration of today's conference. I would like to inform participants that today's call is being recorded. If anyone has any objections, you may disconnect at this time. I would like to turn the call over to your conference host, Captain Tisha Bridge. You may begin.

Good afternoon, and thank you for joining us today for the DCOE Traumatic Brain Injury February webinar. My name is Captain Tisha Bridge. I am the Chief of the Office of Education Outreach for the Defense and Veterans Brain Injury Center. I will be your moderator for today's webinar.

Before we begin, let us review some webinar details. Live closed captioning is available through Federal Relay Conference Captioning. Please see the pod beneath the presentation slides. Adobe Connect and Defense Connect Online are the technical platforms hosting today's webinar. Should you experience technical difficulties, please visit [dcoe.mil/webinars](http://dcoe.mil/webinars) to access troubleshooting tips. If you cannot connect via Adobe Connect or Defense Connect Online, please continue to listen via the phone and go to [dvbic.dcoe.mil/online-education](http://dvbic.dcoe.mil/online-education) to download the slides.

There may be an audio delay as we advance the slides in this presentation. Please be patient as the connection catches up with the presenter's comments. During the webinar, please submit technical or contact-related questions via the Question box. The Question box is monitored and questions are forwarded to the moderator for response during the question and answer session during the last half hour of the webinar. Our presenters will field as many questions as time permits.

Please feel free to identify yourself to other attendees via the Chat box, but refrain from marketing your organization or product.

Today's presentation and resource list are available for download from the Files box below and will be archived in the Online Education section of the DVBIC website. Please note that continuing education credit is not available for this event.

I will now move on to today's webinar topic, TBI Management in the Deployed Environment, The Concussion Care Center Model. Traumatic Brain Injury occurs when trauma to the head interrupts the function of brain. TBI is commonly known as the signature wound of Afghanistan and Iraq conflicts. Drawing on personal experience at the National Atlantic Treaty Organization Role 3 Hospital in Khandahar, Afghanistan, the presenters will share their approach to TBI management in the deployed, multidisciplinary setting. The discussion will delineate the role of the concussion care center, a role proven instrumental in contributing to a significant increase in the return to duty rate for service members. Additionally, the presentation will highlight psychological and trauma cloaking aspects affecting recovery following a concussion in a forward deployed location.

At the conclusion of this webinar, participants will learn to describe the interdisciplinary treatment approach to TBI in the deployed setting, explain the phases of recovery at the concussion care center, identify early interventions following a concussion to prevent Post Traumatic Stress Disorder, PTSD, evaluate the impact of post-concussive symptoms and PTSD on cognitive functioning.

I would now like to introduce our first presenter, Captain Catherine Hill. Captain Hill, the Assistant Chief of Occupational Therapy at Martin Army Community Hospital, Fort Benning, Georgia, possesses more than five years of experience as an occupational therapist. Her current practice focuses on orthopedics and mild traumatic brain injury. In April 2013, Captain Hill deployed to Kandahar Airfield, Afghanistan, for seven months as the officer in charge of the Concussion Care Center, (inaudible) Regional Command (inaudible). In addition to her clinical responsibilities, she managed and had training oversight of approximately 250 providers, medics and corpsmen in concussion recognition, evaluation and management at the Occupational Therapy Orthopedic Clinic at Kandahar Airfield during this period of deployment.

Thank you for your participation and welcome, Captain Hill.

Good morning, everyone. I would like to talk to you today about mild traumatic brain injury care, also referred to as MTBI care in a deployed setting.

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The views here represented are my own, and do not necessarily reflect those of the United States Army, the Department of Defense, or the federal government. I have no financial conflicts.

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Today I would like to advance your knowledge in MTBI screening and evaluation, care models, briefly discuss DOD policy guidance and documentation, and review Purple Heart guidance in regards to concussions.

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TBI is broken into three categories according to the severity of the injury, not the severity of the symptoms. We will be focusing on Mild Traumatic Brain Injury, which presents with normal imaging, loss of consciousness (LOC) up to 30 minutes, alteration of consciousness (AOC) up to 24 hours, and/or post-traumatic amnesia. Symptoms alone do not equate to a concussion diagnosis. Loss of consciousness is not required for the diagnosis of concussion. In fact, only about ten percent of concussions result in actual loss of consciousness, often lasting less than a minute. Confirmed loss of consciousness greater than five minutes is considered a red flag and requires referral to a Level 3 facility for further evaluation and brain imaging.

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What constitutes a head injury event? A vehicle incident, a blast, a collision or a rollover, a blast within 50 meters of the individual whether they are inside or outside. If they feel the over pressure from the blast wave, they should be evaluated. Anyone who sustains a direct blow to the head, be it a fall, a sports injury, an assault, or a workplace accident, receives a command directed referral. This can include a positive reading on a blast sensor worn on the service member's Kevlar, or if a service member is exposed to multiple blasts. If the service member tries to decline evaluation and/or treatment, the commander can override that decision if it's in the best interests of the patient. Every service member who is involved in a head injury event is given 24 hours mandatory down time regardless if their screening is positive or negative, though commands can delay or postpone that based on mission requirements. That delay must be documented.

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The Department of Defense Instruction 6490.11 is the policy guidance for managing concussions in theater. It not only outlines head events as we just discussed, but it also outlines requirements for both medical personnel and line leaders. Medics, corpsmen and providers must utilize the (inaudible) when

screening for concussion. All encounters must be documented in the service member's electronic health record using the correct ICD-9 codes, and they must follow the algorithm which guides their decision-making process for each patient.

Line leaders are responsible for checking out those involved in a head injury event using the IED Heads Checklist, which we will discuss in just a moment. They are responsible for insuring that anyone identified as exposed be evaluated and treated as appropriate by medical personnel. They are also to document all incidents in the Blast Exposure and Concussion Incident Report, the BECIR, module within the Combined Information Data Network Exchange, the CIDNE.

Both medical line leader parts are extremely important when it comes to Purple Heart consideration. All pieces of the puzzle must be present, complete and accurate so the service member can receive what they rightfully deserve in a timely fashion. If any part is missing, incomplete or inaccurate, a delay or even a denial can occur.

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This is the IED Heads Checklist. It is an easy-to-follow screening for non-medical leaders to utilize in order to get their men and women to the right care providers. Again, this information is recorded in the BECIR CIDNE.

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Prior to 2010, up to 90% of concussed individuals were being undiagnosed, redeployed, or evacuated out of theater. There was a lack of standardization in many areas, including training, facilities, staffing and medical documentation. In 2010, concussion care in theater was completely overhauled. Concussion care centers were established across the battlefield in order to treat the injured service member as close to the unit as possible. Since then, the return to duty rate has been around 95% within two weeks.

This is the care model that has been used since 2010. Level One starts at the blast incident and battalion aid station. Here the medics or corpsmen perform the initial (inaudible) screening. The unit physician monitors the patient daily up to 48 hours. If the doc feels the patient needs a higher level of care, they can send him or her to Level Two or to Level Three. Level Two has a concussion care center run by an occupational therapist and an occupational therapy tech with access to a Level Two physician and cognitive testing. Level Three has a multidisciplinary team including physical therapy, occupational therapy, neurology, neuropsychology, behavioral health and imaging.

CT scan is currently the only method of study for concussion evaluations available at this time. If the patient requires long-term care, they are sent to (inaudible) or back to the States, Level Four.

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As noted earlier, every potentially concussed individual receives 24 hours of mandatory down time, which begins at the point of injury. This down time can take place at the individual's post with monitoring by the unit doctor. During this down time, any activity that risks a repeat concussion is prohibited. If the mission dictates that the service member participates, this must be documented in the CIDNE BECIR report.

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Primary care management encompasses several areas. The patient is provided a restful environment and their sleep quality is monitored. Duty restrictions are implemented, and headache intensity and frequency are tracked and treated as appropriate.

The number one treatment for a concussion is education. Using terms the patient understands is critical. Traumatic brain injury is a scary term for so many people, and it can lead to questions about immediate

and long-term fitness for duty, long-term consequences once they return home, and a general anxiety they don't need to go through. I had dozens of patients ask me if they sustained a traumatic brain injury or a concussion because they simply didn't understand what they were told at the hospital. Using the term concussion when explaining their diagnosis can be the best thing for them. Assure them that most people fully recover without any long-term side effects within a few days to a few weeks. They need to know that there is hope for them to heal and to get back to their missions and to their battle buddies, where all of them want to be.

Reevaluation occurs daily up to 48 hours. If primary care is not as effective as expected, don't hesitate to send the patient up the chain of care. Avoid narcotics for pain management, as brain function is already slowed due to the nature of the injury and narcotics only exacerbate the situation.

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According to the DOD Instruction 6490.11, specific information is critical to document in the service member's medical record. The MACE score, the number of concussions sustained in the last 12 months, any symptoms experienced, the patient's sleep quality, a detailed description of the event, and the result of any additional screenings that are pertinent to the cognitive and/or emotional and behavioral health of the service member. The DODI allows medical providers to decide which would be best to administer. All screenings should be performed using clinical judgment.

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The MACE, the Military Acute Concussion Evaluation, is a standardized concussion interview and assessment tool. It is used in conjunction with clinical judgment. Consistent administration in its proper sequence is crucial for obtaining accurate results. The main MACE score for a non-concussed individual is 28, so a score under 28 is not necessarily indicative of a concussion. There are many factors that can affect a score. If someone just watched their battle buddy be wounded or killed in action, they can have a hard time focusing on anything you're saying.

Pain is another big factor. Any medications they are given or sleep deprivation they are experiencing may also work against them.

A blast could damage their hearing, which could result in a lower score simply because of the injury to their tympanic membrane.

There are three parts to a MACE score, a cognitive score, a neurological score, and a symptoms score. Each part must be recorded. Again, this is critical not only for the continuity of care, but when a Purple Heart case is reviewed for a concussive injury, the MACE score is one of the pieces of data the reviewers look for.

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All service members are to sit for a neurocognitive assessment prior to deployment. The Automated Neuropsychological Assessment Metrics, or ANAM, is what the DOD recommends for pre-deployment and post-concussive injury evaluation. It is not a diagnostic tool, but rather an aid to assess how well a patient is progressing through their recovery. Serial testing can be performed in theater, and the results can be prepared to the test they took in the States. It looks at immediate attention, sustained attention, and processing speed, among other facets. Both Level Two and Level Three have ANAM testing capabilities.

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Role 2 and Role 3 concussion care centers are very similar in the care provided by the occupational therapists who run them, though there are some differences. Role 3 utilized a more multidisciplinary

approach and worked more closely with the hospital, whereas Role 2 worked more closely with Charlie Med (sp). Both OTs provided MTBI training to other providers, though the locations of the training varied. Role 2's concussion care center had the line leaders in units more directly accessible whereas Role 3 communicated through secure telephone calls and secure email. Role 2 and Role 3 worked tirelessly to provide the injured with the high caliber of care both expected and deserved.

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What helps brain recovery? Maximizing down time during the day and receiving adequate sleep at night allows the brain to devote its energy and resources to recovery. Keeping physical demands low also allows for proper healing. Easing the service member back into their normal routines while monitoring symptoms is the focus of all concussion care centers. We would start with an evaluation day, which would then be followed by several days of games with progressively increasing demands. A trivia board game, a board game like Cranium where they would have to work on teams to act out clues, and then finally Xbox Kinect where they would have to get up and move in different directions to control the avatar on the screen. All the while they would be educated as to how to monitor themselves for an increase in headaches, dizziness, visual and auditory disturbances, nausea and other discomforts. We taught them meditative breathing to help self-treat their symptoms without medications or outside assistance. If that didn't help, they got to retreat to a quiet room until they felt well enough to reengage. They were never pushed past their comfort level and all symptoms and methods of alleviation were documented in their treatment notes.

OT sessions were worked around any other treatments they required, such as PT, neuropsychology and medical appointments. They were encouraged to follow a regular schedule for waking, sleeping and mealtime.

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Service members will often engage in activities during down time that might actually disrupt or delay brain healing to include staying up playing videogames, consuming caffeinated beverages or energy drinks that will often disrupt sleep, exercising or weightlifting, and participating in full contact sports or combatives. I had a rule for my patients, no coffee after breakfast. If one cup could carry them through the day, a cup in the late afternoon could interfere with their ability to unwind in the evening and cause insomnia.

It is critical to avoid a second concussion during the period when the brain is healing and is especially vulnerable to even minor trauma. This period may last several days up to several weeks.

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A (inaudible) concussions influence the length of down time the service member requires before they can be considered for return to duty. They must wait 24 hours after their first concussion before they can be considered for return to duty. If they have had two concussions in the last 12 months, they get seven days past the resolution of symptoms. So if it takes seven days for symptoms to resolve, they must wait seven additional days before they can be considered for RTD.

If they have had three concussions or more in the last 12 months, they must receive a concurrent concussion evaluation by a neurologist in order to be considered for RTD. I would allow a service member to return to their unit for any remaining down time provided they could pass their exertion testing after explaining that they were to remain on what is known in the Army as a dead man's profile. That means nothing strenuous to the body or to the mind. I would communicate all instructions to their chain of command so everyone was on the same page. I would instruct the patient to follow with their unit physician for the ultimate RTD clearance.

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Exertional testing is conducted upon resolution of symptoms. I would use a stationary bike to elevate their heart rate for five minutes, have them come to a slow stop and then dismount. I would have them stand in place for approximately one minute and then have them perform five pushups. The increase in heart rate and changing of planes could cause or exacerbate symptoms, such as headache, dizziness, visual disturbances and nausea. If symptoms were reported, a determination to retain the patient or send him or her to a higher level of care was made at that time. If a service member needed to perform a modified exertion test due to physical injuries, PT was consulted as to the best exercise to limit discomfort.

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The Purple Heart differs from all other decorations in that an individual is not “recommended” for the decoration. Rather, he is entitled to it upon meeting specific criteria. Examples of external forces may include any of the following events: a head being struck by an object, a head striking an object, the brain undergoing an acceleration or deceleration movement without direct external trauma to the head, a foreign body penetrating the brain, forces generated from an event such as a blast or explosion, or other force yet to be identified.

The injury event must have resulted directly from an enemy or hostile act, international terrorist attack, or friendly fire. Examples of enemy-related injuries which clearly justify award of the Purple Heart are as follows: injury caused by enemy bullet, shrapnel, or other projectile created by enemy action, an injury caused by enemy-placed mine or trap, an injury caused by enemy-released chemical, biological or nuclear agent, an injury caused by a vehicle or aircraft accident resulting from enemy fire, or concussion injuries as a result of enemy-generated explosions.

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For a Purple Heart to be received for a concussion, two conditions must be met. An injury event from an external force must occur, and LOC, AOC, PTA, any neurological deficit, or an intracranial lesion must occur. Symptoms alone do not qualify a service member for this medal.

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Award of the Purple Heart may be made for wounds treated by a medical professional other than the medical officer provided a medical officer includes a statement in the service member’s medical record that the extent of the wounds were such that they required treatment by a medical officer had one been available to treat them. Mandatory rest periods, in and of themselves, do not constitute qualifying medical treatment.

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Examples for concussion treatment for soldiers is described in (inaudible) Message 11-125 and include a limitation of duty following the incident, a recovery or rest period directed by a medical professional, a referral to a theater concussion care center, and referrals to any medical specialists.

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For the Marines and Navy, guidance can be found in MARADMINS 245-11. Marines and sailors must meet one of the following criteria for a Purple Heart to be awarded for a concussion: either a concussion with associated LOC or a diagnosed concussion with persistent signs and symptoms or functional impairment that results in the service member being declared not fit for full duty for more than 48 hours. The medical officer must document one or both of these criteria within seven days of the injury event.

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When contemplating an award of this decoration, the key issue that commanders must take into consideration is the degree to which the enemy caused the injury. The fact that the proposed recipient was participating in direct or indirect combat operations is a necessary prerequisite, but it is not full justification for the award. As listed, these are the service specific documents that can be referred to when seeking guidance on the Purple Heart medal.

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So the first question, how many hours of mandatory down time does the service member receive following a head injury event?

And the correct answer for that is B. It's 24 hours.

When does the down time clock start?

And the correct answer for that is immediately after the head injury event.

What percentage of service members who sustain concussion in theater are able to return to duty?

A is the correct answer. Greater than 95%.

In summation, we discussed MTBI screening and evaluation, concussion care center models, policy guidance and documentation regarding concussion care in theater, and Purple Heart considerations.

Thank you for your time and the opportunity of speaking with you on this important topic.

Thank you for your presentation, Captain Hill. If you have any questions for Captain Hill, please submit them now via the Question box located on the screen.

I would now like to introduce our second presenter, Commander Randy Reece. Commander Reece is a Senior Neuropsychologist at the Intrepid (inaudible) Concussion Recovery Center at Naval Hospital Camp Lejeune, North Carolina. His primary responsibilities include neuropsychological assessment of cognitive functioning with program participants, interdisciplinary treatment team planning, and principal assistant investigator in multiple research in clinical practice improvement projects. During his assignment to the National Atlantic Treaty Organization's Role 3 Hospital in Kandahar, Afghanistan, Commander Reece's primary responsibility was that of a subject matter expert on concussion assessment and recovery and early intervention for trauma exposure for service members presenting to the concussion care center.

Commander Reece's background includes over ten years as a U.S. Navy clinical psychologist with specialization in neuropsychology.

Thank you for your participation and welcome Commander Reece.

Thanks and good afternoon. Thanks to DCOE for inviting me to present, and thanks to everyone that's logged in. This webinar format is new to me. My preferred method of doing presentations or discussing this is to have a face-to-face discussion. I prefer having discussions rather than lecturing because I'm sure a lot of you have significant experience and insight, so I encourage you to submit questions and maybe we can have some of the discussion at the end.

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Have the standard disclaimers here. No relevant relationships. And I don't prescribe so I'm not going to recommend any off-label use of medications.

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With our objectives, I expect that most of you are familiar with symptom presentation following concussion, and Captain Hill has already reviewed the primary areas of concern and standard interventions that we followed in the deployed setting. I'll briefly touch on some cognitive changes often seen with concussion, and then cover some other factors that seem, at least in my experience, to complicate a recovery process. I'll briefly review some of the available interventions and go over just a really brief review of research for early intervention. And then I'd like to share some of the alternative interventions that were available to us that seemed, at least anecdotally, to be helpful for recovery and return to duty in theater.

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Captain Hill has given an explanation of the typical course of concussion recovery in theater including the protocol for assessing and monitoring symptoms and symptom recovery and the interventions that she used there to foster recovery to full recovery and overcome many observed difficulties. However, in theater, the source of concussion is often a traumatic event, such as an IED, and these events often include significant injury or loss to members of the team, and they're typically life threatening. And they are often repeated experiences, meaning that they may be exposed to IED blasts or threats of IED blasts several times during the course of a deployment or deployments. And these experiences are often sustained within the larger context of ongoing stress, sleep deprivation, and kind of chronic heightened vigilance. I think that all of these may be factors in what often turns into long-term symptoms.

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So to give you a little bit of a background on my mindset going into the work over there, I was deployed, I was actually in country, from about February until early September, but I had come from a year or so of working at the Marine and Sailor Concussion Recovery Center at Camp Lejeune and a few months at the National Intrepid Center of Excellence in Bethesda, Maryland.

But we typically see service members who have experienced a concussion months to years previously that are still symptomatic when we see them. So typically we would expect recovery of cognitive functioning within a couple of weeks following concussion, but instead, in these patients that we saw long term, typical complaints included difficulty with attention and concentration, multitasking, short term memory, even things like word finding. They would also often comment on cognitive fatigue, a difficulty with sustaining cognitive effort for long periods of time.

Outside of the cognitive domain, balance was also a common issue as well as blurred vision.

In nearly all the cases that I have seen as a neuropsychologist here in the clinic, service members report long-standing sleep deprivation. They typically get four to five hours of sleep per night, and this is usually broken sleep so it's not restful and restorative. They also report varying degrees of anxiety ranging from hyper-vigilance in some situations to full symptoms for PTSD. And they also usually have chronic pain, typically headaches, but often back and knee pain and other pain from injuries as well.

Now we know from the literature from a cognitive perspective, any one of these factors, sleep deprivation, chronic anxiety, chronic pain, they can all have negative and somewhat overlapping effects on cognitive functioning. And the effects are similar to those seen in acute concussion. It's very common for us here in the clinic to see resolution of cognitive difficulties as sleep, anxiety and headaches resolve.

The course of symptoms typically indicates these factors as having more of an impact on cognitive functioning in chronic cases than the concussion itself. Now what I mean by that is if you do a careful history with the patient, you'll find that oftentimes they may notice cognitive problems months after the concussion event. And sometimes they'll report that not only do these not get better like you'd expect

following a concussion, but they actually worsen over time which we wouldn't expect based on the physiology of what happens in the brain during a concussion.

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So with concussion recovery, it's clear that the ideology of cognitive difficulties can be complex and multifactorial, so I'd like to briefly break down some common cognitive changes associated with each of these contributing factors.

As we know and as Captain Hill has talked about, the acute effects of concussion on cognitive functioning generally can include changes in processing speed, span of attention, so not only the duration but the amount of information that a person can get in at one time, working memory, which is not storing information away for long-term retrieval, but just holding information in mind for a brief period to work on that like if you're holding a number to dial it. And then also complex attention, and by complex attention I mean things that we typically call multitasking, so alternating attention, screening out distractions, selective attention, things like that.

These types of difficulties with simple and complex attention and processing speed can also result in problems with memory, which is one of the primary complaints that we see.

Also psychological factors are known to impact cognitive functioning negatively. Chronic anxiety and stress can impact aspects of attention particularly with switching or selection, being able to select what you want to attend to. And it can also have a negative impact on working memory.

Frontal executive skills, things that I describe to patients as like the manager part of the brain, being able to solve problems, switch back and forth, manage complex information, that's also impacted. You'll notice on the slide that I have that in parentheses because some people consider complex attention and aspects of frontal executives to kind of overlap.

We know that sleep deprivation, particularly chronic sleep deprivation, can have a negative impact on cognitive functioning. This seems to particularly have an impact on processing speed as well as accuracy.

When you have disruptions in processing speed and attention, like I mentioned before, more complex cognitive function such as learning and memory and also work finding may be disrupted.

So this is kind of my background. My experience with chronic symptom presentation and treatment in mind. I wanted to have an idea. This was what gave me my idea that disruptions in cognitive functioning may be multifactorial and involve more than just the acute effects of concussion. So my objective in (inaudible) was to try to find ways to reduce or prevent some of the symptoms that appear to contribute to chronic problems.

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So even though my training was as a neuropsychologist, I wasn't deployed as a neuropsychologist. I was in a clinical psychology billet. So Captain Hill and her assistant were primarily treating concussion, and then when there were trauma reactions that came up, that was when I was able to try and intervene. So in order to have some idea on how to prevent the chronic problems, particularly those related to trauma exposure, it's helpful to understand how chronic psychological symptoms may evolve from trauma exposure.

When people are exposed to trauma, it's normal to experience a traumatic reaction. Anything from re-experiencing it to heightened anxiety, vigilance levels, difficulty sleeping, emotional disturbance, these are all normal reactions. But in the majority of people these resolve relatively quickly. When they don't resolve, sometimes we'll diagnose this as an acute stress disorder. And just briefly experiences are re-experienced, you know, the trauma is re-experienced whether it's through dreams, or nightmares,

thoughts, flashbacks. They tend to avoid stimuli, anything that will remind them of the event. And they also have an increased level of arousal which could cause difficulty with sleeping, irritability, problems with concentration. And with acute stress disorder, it's when the symptoms last for two days for up to four weeks. And this is when it occurs within four weeks of an event.

In more chronic cases we call the symptoms Post Traumatic Stress Disorder, so the same types of symptoms that I just went over, but it's when they persist for more than a month.

So even though we didn't have service members in our clinic for more than a month, my goal was still to try and prevent that chronic presentation. So that was what we were targeting.

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I'm going to briefly go over a few basic theories of what PTSD is primarily because these theories of how PTSD may develop have some overlap in terms of concussion symptoms, and there appears to be some interplay between concussion symptoms and chronic anxiety or Post Traumatic Stress.

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One theory of PTSD looks at symptom presentation as a learned response based on conditioning. And with classical conditioning, a fear response can be linked to certain triggers, whatever the traumatic event was. And then avoidance behavior develops in order to reduce the anxiety. And the reduction in anxiety then reinforces the avoidance in an operating conditioning model. So you can see people may become sensitized to internal cues as well, heart racing, that nervous feeling, anxious feeling. They become sensitized to that, too, and then may avoid triggers as well, so there's conditioning going on in a learning paradigm in both of those.

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From an information processing perspective, there may be a breakdown in the way the information about the traumatic event is processed. For example, traumatic experiences often violate our just world belief, which is basically an operating scheme of rules such as if I do A, B and C, then X, Y, Z should or shouldn't happen. Violations cause a sense of helplessness, and then as a result, fear and anxiety.

Even in a war zone you might think that well, if you're in a war zone and you're fighting over there, then you should expect to have your life threatened, but I think service members, even though they know that they are being targeted, it wasn't uncommon for me to hear them say things like, if I had just done this or that, you know, if I had just used a different lighting system to look for the IED, or if I had been in this position instead of that person, so it was clear to me that their scheme of – their rules of a just world had been challenged, then what it seemed to me was there was a striving to have a sense of control, to not have those kind of terrible events happen to them, so it interfered with the way they processed the information about the traumatic event.

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From a memory perspective, memory processes are also impacted by both trauma exposure as well as concussion. So combat trauma memories are often vivid and recalled in a narrative, in my experience anyway. However, concussion can contribute to post traumatic amnesia and can also disrupt a memory consolidation process. I've also noticed that there may be an over prominence of trauma memories that the emotional intensity behind the memory seems to make them be re-experienced more frequently which can contribute to excessive recall, or what we call intrusive re-experiencing.

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So if we have factors such as learning processes, information processing, and memory consolidation and processing, they can contribute to the development of PTSD, and this raises a question of how these processes may interact with each other as well as how they may interact with changes that go along with cognitive processing with concussion.

So you can see I also included on this slide hyper arousal into the mix. It fits with the symptom presentation of PTSD, a physiological manifestation of the trauma reaction. And it's also possible or even probable that changes in brain functioning from both concussion or trauma exposure can contribute to hyper arousal.

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So just a very basic review. A series of the development of PTSD and of possible interplay between the effects of concussion and the effects of trauma exposure processing. Literature indicates that there is often a higher incidence of PTSD in service members with comorbid history of concussion than in those with trauma exposure without concussion. Both I have been able to outline (inaudible) rationale for attempting to intervene early in the process to disrupt trauma reaction as part of the concussion recovery process. In my opinion they are very closely linked.

So in theater the referral and treatment process for concussion has been described. And since Captain Hill is managing the concussion recovery aspect, she and her team did a great job of identifying those who seem to show signs of possible psychological reaction and she would make referrals to me. And despite the goal to intervene early in PTSD and prevent post-concussive syndrome symptoms as well, in my review there is a limited evidence for efficacious treatment to prevent PTSD in the acute aftermath of trauma exposure.

So next I'd like to briefly review some of the literature about prevention which I used to help guide my efforts.

Next slide.

Looks like you got ahead. Go back one.

Oh, never mind. They took one out. Go ahead.

So the next several slides are from a review done by Feldner, Monson and Friedman. The reference for this is at the end. And they reviewed several different levels of intervention, so these slides are all from there. You see the citation at the bottom.

About ten years ago, or maybe a little bit more, when I was fairly new in the Navy, there was a lot of attention being given to critical incident stress debriefing, and as a Navy psychologist I was sent to several different training programs, and I was even involved in teams working at the Pentagon following the September 11<sup>th</sup> attacks using a critical incident stress debriefing model.

Briefly, for those of you who are not familiar, this model uses an intervention that was initially designed to assist first responders to traumatic events, whether natural disasters or something else, rather than the trauma victims themselves. The basic structure was to allow the first cognitive processing of the event. They'd go around and let everyone talk about the facts and what they recalled about what happened, and then everyone got a chance to talk about their emotional experience as well. And the idea was to give everyone a chance to kind of vent and get their thoughts and feelings out and to normalize their experience and to provide some education on what to expect. And then to also make sure they knew what resources were available should there be any long-term problems.

I haven't kept up in depth on the literature, but I have seen updates that procedures have been expanded to include group intervention, interventions for trauma victims, and a lot of other components.

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In this review that we're talking about, the review of studies on psychological debriefing, generally show that venting without cognitive behavioral therapy does not seem to reduce the risk for developing PTSD over the long term. The majority of studies show that critical incident stress debriefing doesn't prevent PTSD. There is even a question that via a route of vicarious exposure that might actually increase the risk of developing PTSD over time.

Next slide.

Another type of intervention was a brief psychological intervention which may include limited aspects of standard psychotherapy such as relaxation, brief exposure, cognitive processing, but in a limited format. In a review of the interventions, two studies were discussed. One of them included education and relaxation skills coupled with self-directed exposure with sexual assault victims. And the second study sought to foster memory integration by having participants rehearse the memory to various people. The first one showed some improvement with symptoms over time, although the statistical significance was not there. And then the second intervention appeared to help reduce the rate of PTSD in the long term. If you think about the past slide, one of the theories of PTSD development was memory integration problems, so they were targeting that, and it seemed like they had some benefit there.

Next slide.

Another type of early intervention for trauma exposure is something called stepped collaborative care. And you can see here on this slide that they had varying degrees of intervention. So at the very lowest level, everyone who was a participant here had access to a case manager around the clock. Those who were identified as having alcohol use problems were referred for motivational interviewing. And then those who at the time of the incident had high psychological distress were referred for psychiatric evaluation and then care as needed. For those who had sustained distress, high symptoms that persisted for more than 24 hours, they were offered pharmacotherapy. And then for those who had PTSD symptoms at three months, they were offered pharmacotherapy, psychotherapy or both.

So in this study, the stepped care approach showed that there was no increase in PTSD, so intervening at the appropriate level resulted in not having an increase in their rate of PTSD symptom presentation, whereas the controls, who didn't get the stepped level of collaborative care, showed a six percent increase in their rate of PTSD over the course of this study. I believe it was a 12-month follow up.

Next slide.

Another type of intervention is an acute stress disorder treatment using cognitive behavioral therapy. So using four to 16 cognitive behavioral therapy sessions versus a repeat assessment, so initial assessment and repeat assessment versus a four-session cognitive behavioral therapy resulted in lower PTSD rates at two months, and then no difference at five months, so there was a change over time.

And then, in a different study, a group CBT for four to six hours versus repeat assessment showed no significant effects of the intervention. And then three other studies showed 20% fewer with PTSD. So it's kind of mixed results with using cognitive behavioral therapy, although it is a little bit more positive than some of the other interventions that we've covered so far.

Next slide.

So really quickly, that was kind of a long review that is summed up quickly here. Efficacy generally showed that cognitive behavior therapy was more useful than some of the other ones like psychological debriefing. The stepped collaborative care was also fairly helpful.

I didn't go over the reviews of medications. I don't prescribe and I didn't want to get too far into that. It just was noteworthy that they commented that use of benzodiazepine wasn't helpful and may have even been more detrimental in the long term.

So, next slide.

Switching to what we actually did in theater.

To try and bring all this together, we used what would probably best be described as a stepped collaborative care using the terminology that we went over just now. My primary objective was normalize the experience and reactions, (inaudible) education, and to decrease hyper arousal and hyperactivation and to facilitate emotional processing when it was needed. The idea was that early intervention and guidance would help reduce longer-term symptoms in that small percentage of people who do not seem to show the typical course of recovery from trauma exposure. It was common for us to get groups of service members who had been involved in a single IED event, although we also had individuals referred to us. Especially when we had groups that were involved in the same event, many interventions were presented in a group format, and it seemed like this provided some cohesiveness, bonding and mutual support. When it seemed like there was a good match, we would also include other individuals in the groups or we'd form groups of individuals.

So the most basic level of intervention that we did for nearly all the service members who came to us with concussion, even those without any indication of complicating psychological symptoms, was an educational component that reinforced and expanded on the information provided by Captain Hill. We would discuss typical trauma response and stress physiology, and we would provide basic education and practice with diaphragmatic breathing and relaxation skills. We also reviewed basic information to try and normalize their experience regarding their emotional reactions as well as letting them know what to expect as far as typical course of processing and integrating their experiences. We didn't get into discussing events in detail as it wasn't a therapy group and we focused more on the education and normalization.

Next slide.

We also had a number of alternative interventions that were available to us. All service members who were there for concussion were invited to participate in something called IRES, which is Integrated Restoration. It's a form of yoga (inaudible) or yoga of sleep developed by Richard Miller. We were fortunate enough to have a CD prepared by Robin Carnes (sp) who developed the IRES program at Walter Reed, and she gave us permission to use her CD with the participants there. Basically what IRES does, it incorporates elements of mindfulness, which is an intentional process and develops a participant's ability to non-judgmentally be aware of physical sensations, thought processes and emotions. So with practice the participant learns to observe without judgment. Participants practice sensing rather than thinking about feelings and emotions and also practice sensing the whole, including full body, full emotional reactions, both pleasant and unpleasant. Some of the exercises also included sensing unpleasant experiences simultaneously with safe emotions, which, in my opinion, was a form of exposure which I'm sure many of you know is an element of (inaudible) behavioral therapy for trauma.

Almost without exception, the service members really enjoyed the IRES experience and found it relaxing and beneficial. I have to admit some of them were a little apprehensive if I used the term "yoga," but once they experienced it, they uniformly liked it and would come back for it. For many of them, it was some of the best rest that they got. Even though the objective wasn't to put them to sleep, many of the would fall asleep during the exercises and they found it very restorative.

We also had access to biofeedback equipment. We were fortunate enough to have some Apple iPad devices with something called the Stress Response Training System on it. It's an application that's being developed in conjunction with the Navy's combat operational stress program. And the iPads had a heart rate variability biofeedback on them with a bunch of educational modules, and it had also had games that would teach relaxation skills. And also some of the games would gradually have increasing cognitive

demands, and so the idea was to be able to maintain the relaxed physiology with increased cognitive demands.

Biofeedback, just in case you're not familiar with it, is the use of technology to monitor biological processes and give some type of feedback, whether it's visual, auditory or something else, to the user. If you've ever used cardio equipment at the gym and checked your heart rate, then you've used biofeedback.

We were using heart rate variability as our measure, and heart rate variability uses an algorithm to calculate the amount of time between heartbeats and then calculates the variability or the standard deviation over a period of time. So it's known that a lower heart rate variability is an indicator of a stressed nervous system which doesn't adapt flexibly. And then a higher heart rate variability, or in other words a greater variability in the time between heart beats over time, is associated with a more resilient adaptive nervous system which can respond to stressors as needed and then return to a healthy baseline.

So we had these portable units. In addition to the stress response training system, we also had a couple portable units of M Wave 2, for those of you that are familiar with it, which monitored heart rate variability. So service members were taught diaphragmatic breathing, focused breathing, then cognitive strategies to help improve their heart rate variability fostering coherence or a more resilient state.

So the purpose of this ties back into what we were talking about before. My objective was, again, to try and bring down the hyper arousal, hyper vigilance that we've seen. And it seemed to help also improve their sleep.

We also had some other devices called Alpha Stem. Some of you may be familiar with that. I think they're gaining in popularity or at least frequency of use. That's cranial electrotherapy stimulation. By my reading, it's technology that's been approved by the FDA since the 1970s for the treatment of headache, anxiety and insomnia, which are all, as you know, prominent symptoms in our population. It uses small electrical current that's designed to foster alpha brainwave state. I've tried to review literature. I'm not sure there's good evidence that we know exactly what's happening, but that's at least the theory behind it. Alpha waves are associated with a restful, alert state. Anecdotally, I've had a service member with persistent headaches interrupt me while I was showing him how to use the device after having it on for just a couple minutes to tell me that his headache was gone. I had another Army special ops operator who had chronic PTSD and a recent concussion who had only slept for about three hours of sleep a night for the last two years. He got eight hours of sleep the first night he used the Alpha Stem, and needless to say, he loved it. Even though he didn't get that every night, his sleep was significantly improved so I sent him out with the unit into the field for a month.

Members typically reported feeling less anxious, more relaxed, and better able to sleep when they used the device. Of course, as is the case with every treatment, it's not a panacea, and I estimated about 75% of people who tried it out there, that they had some benefit with about half of those reporting really significant improvement with headaches, anxiety and sleep. I would say about 25% reported no benefit from it or they found the device to be too annoying or too uncomfortable to continue using it.

So service members seemed to typically have a positive response to these interventions, and it seemed like using the technology or gadgets allowed them to participate in skills building that may have otherwise seemed too touchy-feeling if it had been presented in more traditional ways. And, in fact, these were the primary interventions that we used that everyone was exposed to, and only in a few instances where the traumatic reaction was more pronounced did I ever get involved in more cognitive or emotional processing.

The next slide.

Unfortunately all I have to go off of in terms of efficacy is my anecdotal experiences with approximately 100 service members. I don't have any long-term outcome measures or follow up, although I am

interested in exploring the feasibility of doing a retrospective record review to see if any of the people that we had contact with had a better long-term outcome.

We did notice that the average stay for service members with concussion and no apparent complicated reaction to trauma was about five days while those with noticeable psychological symptoms had an average stay of about eight days, which seems to suggest that there may be some interaction between these two in terms of concussion recovery. Out of all of those that we saw, we only had two that we sent home for not having a good recovery course. They were slated to go home in about a month-and-a-half anyway, and they had really pronounced traumatic reactions and we weren't able to get them to a state where we thought it would be in their best interests to send them back. So I thought it was pretty good out of all that we saw to only have two that weren't able to get back to full duty.

Obviously there's a substantial need for more thorough and well-designed research into effective early interventions. And at least in the short term, longitudinal follow up is needed to see where any long-term benefit from any of these interventions, and if so, which ones or which combinations offer the best outcomes.

Next slide.

So future directions. Clearly there's a need for more research, prospective studies looking at risk factors, interactions, and which type of treatments are efficacious and why.

So it looks like questions are up already.

So the first question, what early interventions for trauma exposers show the most benefit in reducing future PTSD?

Of course the correct answer for that one, I think most people have gotten their votes in, the correct answer is E, cognitive behavioral therapy and a stepped approach, while not 100% across the board, seem to have more positive evidence than the other interventions we talked about.

So the next question, there is good clinical evidence that use of heart rate variability, biofeedback and cranio electrotherapy stimulation are effective interventions to prevent PTSD if used within the first 30 days of exposure to trauma.

So I see that the majority of you are saying yes, that's true. That's good. That matches up with my experience. However, the correct answer is false because we don't have a lot of good quality research that shows that these are effective early interventions to prevent PTSD. It was my anecdotal experience that they were helpful, but I don't have long-term follow up. Now once I told you that, I see that votes are changing and people are saying false, so that's good.

So those are the review questions. I guess we'll open it up to other questions. That's the end of my presentation.

Thank you for your presentation, Commander Reece. If you have any questions for Commander Reece, please submit them now via the Question box located on the screen.

Before we begin to address questions from the audience, I'd like to introduce the Military Acute Concussion Evaluation, or MACE. The MACE is the concussion screening tool for the acute assessment of service members involved in a potentially concussive event and includes the concussion screening, a symptoms screening, and cognitive and neurological exams. Each area must be carefully evaluated, and the results of all evaluations must be included in any MACE report for it to be considered complete. A group of subject matter experts from the Army, Navy, Air Force, Marine Corps, DCOE, DVBC, and the National Intrepid Center of Excellence updated the MACE in 2012. Changes reflect the latest scientific research and enhanced ease of use. This new version should be used instead of the 2010 version.

Military healthcare providers in the deployed setting or pre-deployed training arena execute the MACE concussion screening tool. If you are a medical provider and would like to request the MACE concussion screening tool or more information about this product, please visit [dvbic.dcoe.mil](http://dvbic.dcoe.mil) or email us [info@dvbic.org](mailto:info@dvbic.org). Thank you.

It is now time to answer questions from the audience. We are monitoring the Question box and will forward questions to our presenters for response. If you have not already done so, you may submit questions now via the Question box located on the screen. We will respond to as many questions as time permits.

Our first question is directed to Captain Hill. Would it not be more prudent for TBI patients to get as much mental rest as possible rather than playing games. What do you think Captain Hill?

That's actually a question that I got from a lot of the providers that I had worked with during training. We actually found that the service members who had extended down time between the incident and then coming to see us had a harder time recovering because their natural rhythms had just been disrupted, and it took longer for them to see an improvement. So with the limited input that we were giving them, they were actually improving.

Now with activity, it does have to be very carefully monitored. It's a very fine tightrope that you walk with these service members. But a little bit of input helps keep them focused and motivated, and they do respond better with that.

Do you mind if I chime in on this also even though it wasn't directed to me?

Sure.

The idea of having rest after concussion was based on our understanding of what happens in the brain in terms of the chemical processes that were going on and thinking that if the brain function is disrupted then adding a burden with more brain function might actually cause problems. There are some more recent articles coming out that question how much rest should be really be prescribing. For example, there was one in the journal Brain Injury last year that talks about that, and I'm blanking on the authors right now, but so that recommendation for rest wasn't necessarily based on research that demonstrated the optimal amount of time for recovery but it was more of a theoretical consensus that came up from experts. So necessarily avoiding mental activity for a long period of time may be detrimental, and the journal article talked about orthopedic injuries as well. You know, you don't just put people to bed rest, you get them up to their tolerated activity level as early as possible, so what Captain Hill is saying I think is on track with some of these articles that are coming out that you want to encourage them to be active.

One of the biggest risks with concussion is an expectation bias that they're going to have permanent problems from this. I see this over and over, even with providers in military healthcare, that they talk about your traumatic brain injury, you have a traumatic brain injury, and these service members who don't understand what that means think their brains are permanently damaged, so getting them back to normal functioning as early as they can tolerate without exacerbating symptoms I think is really important.

Super. Thank you to both of our presenters for your insight on that question.

Our next question is directed to Captain Hill, again. Which reference are you sighting when you say before 2010 90% of concussed service members were not treated?

This percentage comes from a review of the data that was received by the recent theater neurology reports. The two theater neurology consultants that I had the privilege of working with were in charge of consolidating the monthly data from all of the regional commands in Afghanistan, and then they presented the cumulative statistics. And it's very fluid as it represents real-time data. Trauma and resultant injury are ever changing, so the numbers were constantly being updated. And the review and

comparison of the data between both the prior establishment of concussion care centers and then after had clearly shown that the positive effect of providing that immediate intervention was just huge on conserving the fighting force across the battlefield regardless of what branch of service was being affected.

That's fantastic, Captain Hill. I hope that answers the question for our audience member.

We'll move on to the next question. This question is directed to Commander Reece. Concussion and PTSD often have very similar symptoms. Is it important to delineate the ideology of each symptom in a trauma patient or should the provider simply treat the symptoms.

Well, there's the ideal answer and the practical answer. Personally I would like it if we could delineate the ideology, but as I mentioned there's so much overlap and I think our level of research is not at a point where we can specify exactly what symptoms come from which ideology. I don't at a VA. During my neuropsychology fellowship I did some training there, and from what I've read in the literature I think the general approach is to have a symptom-based approach to treatment. And from what I see from what we do here, that seems to work the best. Like I said, primarily because I don't think we can answer definitively that question of ideology.

Great. Thank you for your insight into that question, Commander Reece.

The next question received from our audience is directed to Captain Hill. Captain Hill, is there a phased approach to patient recovery in rehabilitation? Can you share what each of those phases might entail?

Sure. We have five phases of recovery. They are pretty basic to understand. Phase One is very symptomatic. Fresh out of the battlefield and, you know, they're having headaches seven out of ten. Lots of dizziness. Not really hungry. Just a lot of stuff going on with them.

And then as they start to improve, they start moving through the next four phases. Phase Two is some resolution. Headaches are starting to come down. Appetite is starting to go up. There's moderate resolution in Phase Three. Phase Four is significant resolution where symptoms are intermittent, kind of coming and going. They have headaches more in the evenings or they have them when they first wake up. And then Phase Five is when they're mostly resolved or fully resolved.

And we have a pyramid approach to recovery, and cognition is at the top. And what we do below those are we work on their meta sensory. We work on their behavioral health. We work on any comorbidities that are occurring, in order to get to the top of the pyramid because cognition comes after all of the other stuff has been addressed and they can actually focus and pay attention to using their problem-solving skills, their time management, their organizational skills.

Thank you for your insight into the phases of rehabilitation for occupational therapists when addressing the treatment and management of concussed patients.

We've received a couple of questions on the ANAMS. This is the Automated Neuropsychological Assessment Metric. I'll forward this question to Commander Reece. The ANAM is frequently employed as a neurocognitive assessment tool to establish baseline cognitive functioning. How valuable is the analysis between the baseline and post-concussion testing in determining a treatment plan?

The ANAM was one of the tools that we got to use out there. For those of you who are familiar with it, there are a number of sub-tests on it. In terms of assessing the impact of concussion, it seems like the reaction time or the speed scores are the most useful ones. So with regard to that question, assuming we have access to the baseline, which we typically did, and assuming that the baseline score was a valid and useful score, the comparison was useful for us. It was helpful to see if there was a change. Of course it's not diagnostic, but it was one information point.

The other thing we used the ANAM for was to track progress over time. You would want to see improving scores, and again, that reaction time is a fairly sensitive score, so (inaudible) baseline from pre-deployment as well as to track progress while they were in care.

Great. Thank you for addressing that question on that particular neurocognitive assessment tool.

The next question is directed, again, to Commander Reece. The participant would like to know, is art therapy being utilized as an adjunctive alternative intervention along with cognitive behavioral therapy and Alpha Stem?

I'm sorry. Would you repeat that question for me?

Sure. Do you have any experience or are you familiar with art therapy being utilized as an adjunctive therapy with CBT and Alpha Stem?

Right. In theater we didn't have access to that. Art therapy, music therapy, some of those additional therapies weren't available to us. I know here at Camp Lejeune that there is an art therapist who has been working with the deployment wellness center with the mental health providers over there, and we've recently started incorporating that in our concussion recovery center as well.

Alpha Stem is used here in the pain clinic, and we're ramping up the use of Alpha Stem here in the concussion recovery center as well, so, yeah, we're adding those into what we do here.

Excellent. Thank you.

The next question we received is directed to Captain Hill. Our participant would like to know are family members involved in the OT's approach to TBI management?

It's not often that family members attend treatment sessions at my clinic. I actually work in an ortho clinic and I do see some TBI patients. I do encourage spouses or significant others to attend. We help educate them about the type of injury that their partner sustained, and what their treatment entails, what they're going through, and how they can help their partner in small ways at home. I hear a lot of times, my wife tracks my schedule for me, or she helps me with my medications, but she gets really upset with me if she has to tell me to take out the garbage seven times. So we kind of help them with internal and external strategies, you know, writing things down, keeping things where they'll see them, using a joint calendar program. I usually recommend Google Calendar for my patients. It's easy to follow and they can share it with their partner. We recommend dry erase boards. And this kind of helps keep the family involved and it helps reduce some of that stress on the couple so that way there are fewer conflicts at home and it's easier on both parties involved.

It's certainly very interesting to hear how family members might be involved in the management plan for concussed patients. Thank you for sharing your insight into that question.

Commander Reece, can you describe a treatment plan a neuropsychologist might use in a concussed patient to improve memory, reasoning and cognitive skills?

I can give a stab at it. We typically have speech therapists as our people who treat the cognitive rehabilitation. They're the ones that give all of our cognitive remediation. Basically you would use some of the things that Captain Hill was just talking about. You'd want to use organizers, planners, reminders. Teach them skills like chunking, consolidating. All these different types of tools and strategies that are going to help them be more efficient.

Also, as I mentioned before, I think processing speed and anxiety are issues, so addressing those underlying components is going to be just as important as teaching the skills.

And then the other thing I'd have to say is I've noticed, and I don't have a good explanation for why this is, but it seems like even when we teach skills, compliance and getting people to consistently apply the tools outside of the clinic is often a challenge. So they'll come in, we'll teach them interventions, and then they go home and try it once or twice and say oh, it doesn't work, I'm not going to do that anymore. And it's hard to get them to make it a habit so that it does work. So that's one of the other things that I would really focus on is trying to insure compliance and having them practice the skill until it does become effective.

Thank you for sharing your experiences related to that question, Commander Reece.

Commander Reece, does your experience indicate that PTSD is a learned response or a disruption in information processing, or perhaps a combination of causations?

If I could answer that definitively I would probably be a lot more famous than I am. It's probably, as I was talking about before, it's probably a combination of both. And especially when it occurs with concussion, we have that added component of causing a process in disruption that seems to, just based on rates of incidence, contribute to more frequent PTSD. So I think the information processing is part of it. I don't know that you can separate learning out from information processing, but I think it's all part of it together. Sorry if that's not a more useful answer.

I think it's very useful. Thank you, Commander Reece.

The next question is also for Commander Reece. Commander Reece, would it be reasonable to expect interventions you described as helpful in theater to be helpful in garrisons, specifically those for persons who experience forgetfulness and irritability subsequent to concussion?

Again, I don't have any good, hard evidence for it, but it's been my experience that those things are helpful. Like I said, I'm a neuropsychologist. I do neuropsych testing. And the primary complaints that people have when they come to me are about attention, concentration and memory. Those are the big areas of cognitive function that they have a problem with. But I find, almost inevitably, if we can get their anxiety under control and get their sleep improved, then their cognitive functioning improves, and so I'm all about any method or avenue that's going to improve that. So the Alpha Stem seems to work for a lot of people. Relaxation. We have people in yoga. We do mindfulness-based stress reduction here. Anything that's going to help lower those I think is going to result in an improved outcome here in the chronic setting as well as in the acute setting.

Excellent. Thank you.

The next question we have is for Captain Hill. Captain Hill, how does a patient arrive at the OT clinic following a TBI in garrison? Are they referred from their primary care manager or from the neurologist?

We get the referral either from their PCM or the TBI clinic physician that we have here on post. We actually have a TBI clinic specific for TBI. The OT slots that are over there are currently open, and there is a civilian certified occupational therapy assistant who has recently arrived on staff. There are also several civilian OTs on staff at our warrior transition unit that can also see them. I hope that answers the question.

I think it would be very helpful for the providers in the audience. Thank you.

Thank you.

Commander Reece, how might a neuropsychologist approach expressive aphasia in a concussed patient?

Well, I think a true expressive aphasia where a person has difficulty producing speech or writing and producing language, a true expressive aphasia would be extremely rare in a concussion. But like I

said, people often do report word finding difficulties, and what this comes across as, they'll be in the middle of speaking and even though they'll have their thought, they struggle to find the correct word or to get their words in a good sequence. So with a very loose definition of an expressive aphasia, you may see that with concussion. And I think that my understanding of that, I think that processing speed is probably the most likely underlying component of that. So if we can take care of the underlying issues that are reducing processing speed, I think the language issues improve. Beyond that, I would defer to my speech therapy colleagues for treatment of that.

Thank you. And we know that there are many speech language pathologists in our treatment teams here in our military treatment facilities as well as in our civilian treatment facilities.

The next question could go to either of our presenters. Could you please comment on your experiences in theater with patients' use of music during the critical days after concussion?

Dr. Reece, do you want to go first?

I'm not sure what the person is meaning by use of music. I don't know if you're talking about music therapy or if you're talking about just their own personal listening. So I'll go with the first one first. We didn't have any particular type of music therapy for them, so during the IRES there was some relaxing music and that was, you know, we would encourage them to use relaxing music to help with the down regulation of hyper arousal.

In terms of their own listening preferences, I'm not sure that many of them had access to music given the setting and how they ended up with that. But we would try and encourage them to not do things that would be over stimulating, whether it's loud music, or video games, or TV and movies, things like that. So Captain Hill, your thoughts?

I'm in agreement with you. You said it very well.

Thank you. We're receiving many questions on complementary alternative methods for treatment, so I will consolidate them, perhaps, into this single question. Commander Reece, what other options might be offered if requested by service personnel, and they offered some potential examples. They included acupuncture, herbal supplements, melatonin for sleep. Do you have any thoughts on that?

I'll try not to go too far outside of my scope of expertise and can't give recommendations. I do know here at the clinic that we have two neurologists who do acupuncture, battlefield auricular acupuncture and regular acupuncture, so that's part of one of the treatment modalities that's available here. Trying to remember the other ones that you mentioned.

They offered herbal supplements or melatonin.

Right. Melatonin is often prescribed by our providers here to help with the sleep. Other herbal supplements are sometimes used. Again, I don't want to go as far as to kind of make recommendations on that, but if there's good evidence for it and a prescribing provider wants to recommend that, I've seen them do it here.

Okay. Thank you for your insight into that question. Again, we emphasize that it's the multidisciplinary approach to treating our patients.

Captain Hill, I'm going to give you the last question for today.

Okay.

Can you help us understand better the role of the occupational therapist in the treatment of TBI in the garrison setting? Do you manage acute or chronic or both types of patients in the garrison setting?

Personally I have seen chronic more long-term issues. We've seen patients here from a few weeks to a few months to a few years prior to them coming in. And our goal here for all OTs is functional independence. So I've worked on mostly cognitive skills such as problem solving and attention span, organization, and use of internal and external memory strategies like we were discussing before. One case that I can mention in particular had a gentleman come in and he was just very overwhelmed. He had a large family and a lot of paperwork in regards to advancement of his career. Providing medical attention for himself, for his family members. So we worked on a binder system for each child, and then separated his medical stuff from his military stuff. And you could just see the difference in him in just a few weeks. Instead of having all this paperwork all over the house, everything was now consolidated into an easy-to-find location. And that was basically what we try to do for all of our patients. We try to get them to a level of functional independence. Even if they need to rely on the external strategies, they are the ones that are in control of them.

Great. That's an excellent response to that inquiry.

That will conclude the question and answer session for this webinar. Thank you again to our presenters. To help us improve future webinars, we encourage you to complete the feedback survey that has been opened in a separate browser on your computer. To access the presentation and resource list for this webinar, you may download them from the Files box below or at the DVBIC website, [dvbic.dcoe.mil/online-education](http://dvbic.dcoe.mil/online-education). An audio recording and edited transcript of the closed captioning will be posted to that link in approximately one week.

The next DCOE psychological health webinar topic, (Inaudible) Sensation in Military and Veteran Populations, is scheduled for February 27, 2014 from 1:00 to 2:30 p.m. Eastern Standard Time. The next DCOE traumatic brain injury webinar topic, Progressive Return to Activity Following Concussion, is scheduled for March 13, 2014, from 1:00 to 2:30 p.m. Eastern Standard Time.

Thank you again for attending. Have a great day.

Thank you. Today's conference has ended. All participants may disconnect (audio stop).