



**Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (DCoE)  
Webinar Series Transcript**

**Understanding Relationship between mild TBI and Post Deployment Health Concerns:  
Evidence, Clinical Implications and Treatment**

**March 27, 2014, 1-2:30 p.m. (EDT)**

Welcome and thank you for standing by. All participants will be in a listen-only mode for the duration of today's call. Today's conference is being recorded. If you have any objections, you may disconnect at this time. Your host for today's conference is Dr. Lolita O'Donnell. Thank you.

You may begin.

Good afternoon. Thank you for joining us today for the DCoE Psychological Health March webinar. My name is Dr. Lolita O'Donnell, and I am DCoE's Planning and Logistics Division Chief. It is my pleasure to introduce today's moderator, Dr. Robert Koffman, a Navy Captain and Behavioral Health Consultant Chief at the National Intrepid Center of Excellence, or NICoE, in Bethesda, Maryland. In addition to his 30 years as a Navy medical officer, Dr. Koffman has collaborated on numerous studies and projects, including the work of the Mental Health Assessment Teams, or MHAT, in a landmark study on the psychiatric sequelae of combat duty in Iraq.

Last November, Dr. Koffman was awarded the prestigious Patriot Award, which was presented to him by the U.S. Special Operations Command for his tireless work with the wounded, the ill and injured military population.

Welcome, Dr. Robert Koffman.

Thank you very much for that kind introduction, Dr. O'Donnell.

We will now proceed with the 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.

Today's webinar is hosted using the Defense Connect Online and Adobe Connect technical platforms. Should you experience technical difficulties, please visit dcoe – and I'll read phonetically, Delta, Charlie, Oscar, Echo – [www.dcoe.mil/webinar](http://www.dcoe.mil/webinar) and click on the Troubleshooting link under the Monthly Webinar heading.

There may be an audio delay as we advance the audio slides in this presentation. Please be patient as the connection catches up with the speaker's comments.

During the webinar, you are welcome to submit, and indeed encouraged to submit, content-related or technical-related questions via the Question box.. The Question box is monitored, and

questions are forwarded to the moderator for response during the Q&A Session, which will be held during the last half hour of this webinar. Our presenters and I will field as many as time permits, and we look forward to a lively discussion.

Please feel free to identify yourself to other attendees via the Chat box; however, please use the Question Box for technical or content-related questions.

Today's presentation and resource list are available for download from the Files box below. If you are pre-registered for this webinar and want to obtain a CE certificate or a certificate of attendance, you must complete the online CE post-test and evaluation. After the webinar, please visit: <http://continuingeducation.dcri.duke.edu> as you see on your screen. The Duke Medicine website online CE post-test and evaluation will be open through Thursday, April 3, 2014, until 11:59 a.m. Eastern Daylight Time.

I will now move on to today's webinar topic, Understanding Relationship between mild TBI and Post Deployment Health Concerns: Evidence, Clinical Implications and Treatment. Mild Traumatic Brain Injury or mTBI, otherwise known as concussion, has been identified as an important injury of the Afghanistan and Iraq conflicts. Controversy exists regarding the relationship between mTBI and other health conditions resulting from service in a war zone.

The goal of today's webinar is to share current research and treatment practices related to post-deployment symptoms, including those attributed to mTBI. This pragmatic discussion will include the perspectives of one of the Defense Department's most cited mental health researchers as well as specialty care provider on ways to manage service members and veterans with combat-related injuries.

After completion of this webinar, participants will learn to identify evidence regarding the ideology and management of post-concussion and post-deployment health problems; examine the complex relationships between mTBI and post-deployment health concerns; and evaluate clinical approaches to the management of service members and veterans with post-deployment, post-concussive complaints.

I now have the pleasure of introducing our first presenter, Dr. Charles Hoge. Dr. Hoge is a retired Army Colonel who currently works as a Senior Scientist and Neuropsychiatry Consultant at the Office of the Army Surgeon General and Walter Reed Institute of Research, and is an attending psychiatrist at Walter Reed Military Medical Center.

Dr. Hoge graduated from the University of Maryland's School of Medicine and completed specialty training and obtained board certification in internal medicine, infectious disease and psychiatry during his 20 years of active-duty service in the United States Army.

He authored more than 100 peer-reviewed journal articles, 20 of which have been published in the *New England Journal of Medicine*, the *Journal of American Medical Association*, and the *Lancet*. Dr. Hoge is also the author of a self-help book, "Once a Warrior--Always a Warrior: Navigating the Transition from Combat to Home."

Thank you for your participation and welcome, Dr. Hoge.

Thank you very much.

Good afternoon or morning or evening, depending on where you're calling in from. It's a great pleasure to be here. I'm going to go through a series of slides initially, and then Dr. Bowles in San Antonio is going to do the second half of the presentation; and then we'll have plenty of time for questions at the end. I'm going to be talking today more generally about post-deployment concerns, weaving in quite a bit of discussion about PTSD and mild Traumatic Brain Injury.

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I don't have any disclosures to make.

Next slide, please.

I'm going to start with a case presentation, so I'll read this. This is a case of Staff Sergeant Warrior, obviously not his real name, a 26-year-old Army infantry E6 with eight years' time in service and three combat deployments, who was referred to primary care due to his responses on the post-deployment health reassessment form. So this would have been at about the five- or six-month post-deployment time period.

Staff Sergeant Warrior's physical mental health symptoms included headaches, back pain, joint pain in shoulders and knees, fatigue, indigestion, concentration and memory difficulties, balance difficulties – dizziness and balance problems, tinnitus, chronic sleep disturbance, depressed mood, anger, hypervigilance, nightmares, avoidance. And he sometimes reported drinking alcohol to get to sleep.

He reports multiple direct combat exposures, including two close-proximity blasts, one of which hit the vehicle in front of him that caused brief – which was a few seconds to a few minutes – alteration of consciousness, where he was disoriented or dazed. He also lost two close team members during the last deployment.

His PHQ-9 -- which is a commonly-used depression screening measure -- score was 15, which is in the moderate depressed range. His PTSD Checklist had a score of 60, which is high, quite high actually. And his AUDIT-C score was 6, which is sort of in the level where you want to ask more follow-up questions about alcohol misuse.

Next slide, please.

Oh, so this is basically a fairly – I think probably a lot of folks on the call will agree that this is a fairly typical case of a lot of the service members that we see in the post-deployment period or veterans coming into the system.

Next slide, please.

Just to reinforce that point, this is a study that Dr. Vanderploeg did looking at the Florida National Guard. I think this was done about two to three years post-deployment. And this is just a simple roll up of reported health concerns, physical symptoms in particular, that the deployed National Guard service members reported compared to service members from the same unit who had not deployed. And you can see big differences in the prevalence of physical health symptoms.

There is a lot of contribution to these symptoms, and we're going to talk quite a bit about that. But I just want you to see the stark differences in percentages for every single one of the symptoms that were looked at in that study. And this is a finding that has been replicated in numerous other studies.

I'm going to start with the first polling question for you. And this is an opportunity to get your feedback at this stage of the presentation. Then I'm going to use your feedback to bounce off the direction of the discussion in the next few minutes.

The first polling question is: What is the most likely cause of Staff Sergeant Warrior's cognitive and physical symptoms? You have a whole range of answers there, so feel free to answer.

At this stage in the polling, I'm going to jump in here. You all are welcome to continue answering. We have almost 60% of participants online marking "all of the above," and another 30% -- so about 60% marking "all of the above" and about 30% marking either A or B, which is mild Traumatic Brain Injury and PTSD. And I really like the fact that this is the way folks are responding because, in fact, that's absolutely correct. What produces these generalized symptoms is quite a bit broader than TBI and PTSD. And I think that a lot of times the lens has been focused on those two conditions without as much consideration of other factors. So I really like the way the audience is answering this question.

And sort of to reinforce this a little bit, if you'll go to the next slide – this is a slide that you probably have seen before in various presentations on the nature of the overlap between PTSD and Traumatic Brain Injury. But I think that it's fair to say that this is really not a model that really explains the data very well.

We all know that all of these symptoms – for instance, take headaches or dizziness or even concentration and memory difficulties – these are very common complaints that individuals have when they come into primary care settings. And there are a heck of a lot of reasons why individuals report those symptoms than just Traumatic Brain Injury and – in this case just Traumatic Brain Injury.

The other fact of the matter is there have been numerous studies that have shown that PTSD actually more strongly correlates with those very symptoms than concussion does, which is somewhat of a confusing result in some respects but is important to have an understanding of. So in reality, this simple Venn diagram that has been widely used in a lot of presentations, really I think is not a model that's very helpful in understanding what's going on with our service members and veterans when they come back from combat.

So just to sort of continue this discussion and reinforcing this, the next slide shows – it's similar to what I showed before with deployment versus non-deployment. In this case, the column – this is a brigade combat team surveyed, I think, in this case was surveyed 12 months post-deployment. This was an active component brigade combat team. And you can see those who screened positive for PTSD on the PCL with a high score of 50 or more, compared with the soldiers in the same brigade who had gone on the same deployment who did not screen positive for PTSD. And you see that the percentages in the left-hand column are significantly higher. In all cases, these were statistically significantly higher than the percentages in the right-hand column.

And we can't go backwards now. I don't want to go back. But if you recall the slide looking at deployed versus non-deployed – when you break out that deployed population – so deployed

versus non-deployed, you have increased generalized physical symptoms. And then if you break out the deployed group into those who screened positive for PTSD versus those who screened negative for PTSD, you see yet more of a stark difference in the prevalence of symptoms.

This has been also repeated in numerous studies. And we know that PTSD is associated with generalized symptoms, probably as a result of the autonomic dysregulation and the dysregulation of the neuroendocrine system. And there is a very strong correlation of physical symptoms. There is also a strong correlation with physical symptoms with depression and probably other mental health problems, but those two have been studied quite a lot.

In the next slide – I'm sort of hitting you with a lot of data slides here. But in the next slide, it's a similar slide. Here you see this is again a group of active component soldiers surveyed in their brigade areas post-deployment. I believe this was three or four months post-deployment. And we looked at those who screened positive for concussion versus those who reported other injuries. Again, these are all folks who went on the same deployment. And those who had concussion with loss of consciousness, in the left-hand column, compared with those who had alteration of consciousness compared to those with other injuries, and again you see big differences in symptom prevalences. And a lot of these are significant. And in this case, it looks just like the other slide in that there seems to be a very strong association of the symptoms in this case with having had a history of concussion.

The problem with this is that when you start putting all the variables into one model – a model that includes depression, PTSD, concussion, and things like the level of combat exposure and demographics – virtually all of these associations with concussion and physical symptoms go away. And PTSD and depression end up explaining the bulk of those symptoms.

If you'll be so kind as to go to the next slide.

Out of all of the symptoms that were significant in the last column in the last slide, concussion with loss of consciousness did remain significantly associated with four symptoms: headaches, memory problems and balance problems. So there was an effect. A reported concussion with loss of consciousness was associated independently with some physical symptoms in the post-deployment period in this particular study. But loss of consciousness was also associated with a generalized symptom that was probably not related to concussion, and you can see the odds ratios of the associations with PTSD and depression are quite a bit higher than the odds ratios associated with loss of consciousness. So again, if you go back to remembering that Venn diagram, you can see that PTSD and depression have a stronger relationship to these various symptoms than the concussion with loss of consciousness.

I'm not saying this to in any way minimize the importance of concussion. I'm just saying that there is a complex relationship in what's happening in the operational environment that is leading to individuals coming back and experiencing generalized symptoms. And a lot of what we're seeing with the generalized symptoms is very strongly associated with PTSD and depression.

I don't think that PTSD and depression are the cause of these symptoms. Just as in this case I don't really necessarily think that loss of consciousness is the cause of these symptoms. I think that the definition of PTSD and depression are the strongest clinical markers that we have for underlying physical and physiological processes associated with extreme exposure to stress and trauma in the combat environment.

And if you know that having a concussion with loss of consciousness, or a concussion even with just brief alteration in consciousness, is a very significant event in the combat environment. It's a very close call on one's life. It's an event that is often associated with other very serious casualties. And it makes sense that in the context of that experience that this would lead to a higher rate of PTSD and depression and in turn underlying autonomic and physiological processes, neuroendocrine processes, that then contribute to generalized symptoms. I hope that's making sense.

The next three slides are available to you for download, and we'll just flip through – just keep going through them. I just showed those to show that there is a lot of literature out there that replicates what I just showed. I'm just reinforcing what I just showed. It's not just my perspective based on the research that we published in 2004 and then replicated again, which is what I just showed you, two years ago. But it has also been replicated in numerous other studies, including a study by Dr. Bowles who is online.

So why are PTSD and depression so strongly associated with generalized physical and cognitive symptoms? Just briefly -- I've already sort of talked about this.

Next slide, please.

The limbic system and the brain stem have very strong connections to the autonomic nervous system. And I'm sorry I don't have a slide of the autonomic nervous system. But you all are probably very familiar with the fact that there are neural connections that connect to literally every organ in the body. And I think that's why you get cardiovascular symptoms, muscular pain symptoms, gas intestinal symptoms and a variety of generalized symptoms associated with these conditions.

I just want to digress a little bit and talk briefly about PTSD in a slightly different way than maybe you're familiar with.

Next slide, please.

And that is to sort of talk about it from an occupational perspective. And that is that virtually every symptom of PTSD and associated symptoms that we see in our service members when they come back from deployment who are experiencing PTSD are based in physiologically-adaptive responses. So being hypervigilant and hyper alert translates in the operational environment to very high situational awareness, sharply-tuned threat perception. You want to have that ability.

Intolerance of mistakes – servicemen come back and they frequently have relational problems either on the job or with their loved ones because of their sort of over-controlling behavior and intolerance of mistakes. But you can see how attention to detail and minimizing mistakes in operation situations is extremely important and hence why that skill gets reinforced when individuals work in those environments.

Guilt, re-experiencing, should have/would have/could have are based in part on the intense training and rehearsal and after action reviews that are done in the military to try and mitigate against mistakes happening the next time people go on a mission.

Sleep problems – servicemen get pretty effective at functioning on limited sleep. This obviously can take a huge physiological toll over the long run.

Anger equals adrenaline, focus, control – autonomic – it's the sympathetic nervous system activation. Even detachment and numbing, which can really impair functioning when individuals get home, has its roots in adaptation, which is the ability to control one's emotions in the combat environment.

That's a bit of a digression. But to me, why this is important is it reinforces that when we're talking about PTSD, we're not talking about a psychological condition. It's defined that way according to the DSM. But we're really talking about a physical health condition that has very significant psychological, emotional and physical as well as cognitive symptoms associated with it and a strong physiological basis for those symptoms. And I think this kind of communication is important in the way in which we communicate with our clients.

Let me go to polling question #2 now. Polling question #2 is: Other than PTSD and depression, which of the following is the next most likely contributor to generalized post-deployment symptoms in Staff Sergeant Warrior?

I must confess, this is a little bit of a trick question because I've already sort of talked about this in a more global sense. And you all have a very good – the way in which you responded to the first question, it was very clear that you already are very much on point with this.

What I'm seeing here is almost 50% of people are reporting chronic sleep loss, and then there is a mix of responses in the other categories. And I like the way in which you're responding to this as well. Chronic sleep loss is huge. I think we don't give it enough credence – the importance of it. We have documented in the operational environment that our service members in infantry units have averaged 5 to 6 hours sleep in a 24-hour period; and most of it, the Circadian rhythm has been completely dysregulated by night operations.

And we have this expectation that this is all supposed to reset smoothly when people come home. But I think that's a very unrealistic expectation.

I threw in somatoform and somatization disorder in column A just to be able to prompt myself mostly to mention that those terms are no longer in the psychological parlance according to DSM-5. Actually a very beneficial thing that DSM-5 did with that section that now refers to that section globally as – I'm forgetting – I don't know. I can't remember, but it's better. Symptom disorders or symptom-based disorders or something like that, but I'm not 100% sure. You guys can look it up -- my apologies.

But there is a very profound shift that has happened in the DSM-5 approach to discussion of multiple unexplained physical symptoms. And I think that that's a very healthy thing that has happened.

Obviously, alcohol and substance use are important. Negative illness expectations are also very important. And I think sometimes the messaging that goes out around the whole TBI label actually has the potential for creating negative expectations. And grief and bereavement are actually surprisingly very important. I think only 6% of you marked that as the next most likely contributor; and you may be right, but I want to show you a study related specifically to grief, if you'll flip to the next slide.

This is a study where we looked at the association of grief over the death of someone close in our service members' brigade combat team infantry six months post deployment. And we looked at the association of physical symptoms, depending on the level of grief that they reported. And most of these losses were team members. And you can see this very, very strong linear association with physical – yes, thank you.

One of our participants – Somatic Symptom Disorder now is the term that is used in DSM-5.

But you can see very strong associations with physical health problems and grief, and a very linear association there.

And then if you look at the next slide where we put everything into regression models, including whether there was a history of concussion, whether the person met screening criteria for PTSD or depression, and their level of combat exposure, demographics, and even alcohol misuse – all loaded in to look at the association of generalized physical symptoms. And here you see actually grief coming out as strongly as PTSD and depression. So I think this is something that's important to think about. We don't really have time to get into the nuances of complex and persistent grief. But it is a research diagnosis now in DSM-5, and I'm sure there is going to be quite a bit more coming out on this.

Next slide, please.

Coming up now on summary – this is the summary slide, and I'm going to talk very briefly about treatment and then turn it over to Amy Bowles to give you more specific information on treatment. But just to summarize, there are lots of factors that contribute to persistent post-deployment symptoms, including what we label as post-concussive symptoms. Clearly, concussions have some relationship; but throughout the magnitude of the associations, are relatively strong compared to some of these other factors.

And I think I'll just move on in the interest of time. But you're welcome to come back and re-look at this and send feedback on it. This is sort of my attempt to do a quick summary.

Very briefly, let me touch on the questions of -- What do these findings tell us about treatment, and what are optimal treatment approaches for generalized post-deployment symptoms that we know have multiple causes?

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If you go into the literature and you look beyond the psychology literature and beyond the concussion literature and start to look at other conditions that involve multiple symptoms that have more than one ideology, you find some interesting clues that might be worthwhile to consider and are in many ways being considered in treatment approaches now throughout the VA and DOD. And I think that it's helpful to really think much more broadly in terms of what literature is relevant for best developing strategies for our patients.

The strategies that I think have the most support in the literature in general – and this is my opinion, but I think that it's substantiated fairly well with the literature – is patient-centered treatment based in primary care. When you have people who have multiple physical symptoms that are interacting with one another, it's helpful to have regularly-scheduled primary care visits with a brief sort of laying on of hands during each visit; and step care approaches to symptom management and attention by the primary care professionals to sort of trusting their clinical

judgment; and trying to protect the patients from having unnecessary diagnostic tests or unnecessary specialty referrals that might actually lead to symptom reinforcement or side effects of treatments.

I think having an interdisciplinary consultative approach and the judicious use of consultation that protects patients rather than just immediately referring to the specialist, having more of a consultative collaborative approach, has been shown to be effective.

Next slide, please.

There are CBT approaches, behavioral activation and stress reduction techniques that have been universally helpful in a number of different conditions. I think motivational interviewing is a very important part of what we do. Care management has a very strong literature in addressing generalized symptoms and managing expectations for recovery. And then also when we start to talk about the interrelationship between physical and cognitive and psychological symptoms, it's not to sort of convey the message that we think that the physical symptoms/ the cognitive symptoms are psychologically generated or in the person's head, which is the way a lot of patients receive the information, but to really strongly educate patients that there are physiological underpinnings for what they're experiencing.

I'm going to close there and turn it over to Amy Bowles, who has more specific information on her treatment program. Thank you very much.

Thank you, Dr. Hoge.

Before Dr. Bowles begins, please let me remind everyone that you may submit your questions in the Q&A pod right now. We're actually starting to get some interesting questions. So please, get your questions in the queue so that we can address them.

It's now my pleasure to introduce our second presenter, Dr. Amy Bowles. Dr. Bowles is the Brain Injury Rehab Center Service Chief at the San Antonio Military Medical Center in San Antonio, Texas. She is board certified in physical medicine and rehabilitation and served as Staff Psychiatrist at Audie Murphy Veterans Affairs Hospital.

Her current and past academic appointments include Adjunct Assistant Professor in the Department of Rehabilitation Medicine in Occupational Therapy at the University of Texas Health Science Center. In addition to her many clinical responsibilities, Dr. Bowles is also the principle investigator for two traumatic brain injury research protocols.

Thank you for your participation and welcome, Dr. Bowles.

Thank you. It's nice to be here. I appreciate the invitation.

What I'm going to talk about, kind of following on Dr. Hoge's comments, is how we've implemented this in our clinic here at San Antonio Military Medical Center which, for those of you who are having a hard time keeping up, sometimes it's Brooke Army Medical Center and sometimes it's San Antonio Military Medical Center. That's why it's confusing – because it is confusing.

I don't have anything to disclose – no financial relationships and these views are my own.

I'd like to bring us back to Staff Sergeant Warrior. This is a pretty typical patient who will present to the clinic, and he has this litany of symptoms. And what are you going to do with that? What are you going to do with all the information that Dr. Hoge has presented, and what are you going to do with the patient actually sitting in front of us?

A lot of things – like the Clinical Practice Guidelines – might suggest symptom-based management, which is absolutely true; but you have to be very careful about sending people to five million appointments. If you were to take this and send it to each of these specialties, this is fairly overwhelming.

This is a lot of different appointments, and it's probably not really that helpful for the patient in the long run. It's logistically difficult and exhausting for the patient. That's a lot of appointments to go to. With all of these different cooks in the kitchen, there's a lot of conflict. People will give medications for one thing that exacerbates another thing. The instructions will be different. You'll be given instructions to rest; you'll be given instructions to exercise; and the education will be different. And so it's really challenging when you invite this many people to take care of the patient.

We have to also remember that these sort of meta messages we're giving, the patient thinks – Oh, my gosh, I must really be bad. She's sending me to about a million people. What is wrong with me? This must be really quite terrible.

And then there's also that you kind of undermine your own expertise in that – I don't know that she really knows what she's doing. Is she going to be able to help me? And I don't think those things are generally helpful for our patients a lot of the time.

We use an interdisciplinary rehabilitation model here, and that's what I'm going to talk with you about today. There is a lot of talk about interdisciplinary teams and multidisciplinary teams. And maybe it's a semantic difference, but I don't actually think so. The key part of the interdisciplinary team is the collaborative work towards setting the treatment goals and helping the patient to carry these out. It's not just everyone sat and heard the story at the same time. It's about we are all going in the same direction, we're working on the same goals, and we have this kind of buy-in with the patient and this partnership with the patient.

The composition of an interdisciplinary team may vary related to the patient's needs and the clinical resources. But one of the core things is for there to be common beliefs about what's going on and how we're going to help this individual. It works best, in my opinion, when the group truly functions as a team. And I'm a rehab doc – full disclosure – and for us, the focus is really on function. And this is a rehabilitation team.

So when we talk about function, we try not to get too wrapped up in the cause because whatever the cause might be – Sergeant Warrior is having trouble getting to his appointments on time. And there are a lot of ways we can help him, regardless of what the cause might be. And it's also important for everyone to recognize that many things contribute to these symptoms, as you guys did well on your polling question.

One of the examples we tend to give is if half of your attention is focused on those footsteps in the hallway, you're going to have trouble remembering what we're talking about right now. It's another example of how those behaviors that are adaptive in countries can cause you problems when you get here. And so we work a little bit on normalizing some of that experience and

talking about – We've got to work on how to fix this and make this more functional for you, help it work for you.

And then it's also really important to understand that physical therapy or speech therapy or occupational therapy or any of these kinds of modalities is really not the right place to treat depression or PTSD or any kind of co-occurring mental health issue. Because at PM&R, I don't know how to do that either. And so it's important not to provide a stand-in. We are treating it. You don't actually need to go over to see your social worker or your psychologist or psychiatrist because really we want to support and facilitate and encourage that so that they get that assistance as well. I can work on teaching you to use a calendar all day long for months and months. We can help you work a calendar, but we're not going to necessarily address these underlying issues with depression or PTSD.

One of the nice things about our clinic is we are really set up for success. It is a charmed world in some ways. All of the services are co-located in the same clinic. And administratively, we are a single clinical service in the Department of Orthopedics and Rehab. What that means is it's the same people every day. They don't get pulled to cover the inpatients or the outpatients. And we all live together, so it's really easy to talk running in the hallway, over lunch – those sorts of things – if it's really important.

We also have this team philosophy that many things contribute to cognitive symptoms; we believe that we can help these patients; and we believe that we experts. I can't overemphasize the importance of communication because it really doesn't help the patients when they get a lot of different messages.

So Sergeant Warrior comes in, and what are we going to do? As I said, we are a rehab clinic; we're not situated in primary care. And so we have the luxury of having the initial clinical interview to be 60 minutes long. So we document the concussion history and then explore the current complaints. So we talk about – Are you having some headaches, pain, dizziness? -- all of these different things that Dr. Hoge detailed, some psychological issues.

And what we really want to focus on are the functional issues: I'm having trouble with my appointments. I can't find things. I lose my keys all the time. I'm really messing up with my medications. And then we talk about past and present management of these symptoms and do a lot of education. They will have regularly scheduled follow-ups with the provider, which might be me; or it's more likely one of the PAs or the nurse practitioner. And they'll follow up every few weeks until they've had subjective improvements and are discharged from the other services within our clinic.

For all these follow-on visits, they will present to the same waiting room; and the team knows them. So it's a very different experience than being sent over across town for this or over to that clinic just two floors over, which makes it very nice.

So the education – you hear a lot of talks about education is really important, and we need to do education. There are a lot of educational materials. But there is not as much discussion about what it is and what to do – more than just a handout. We do a lot of education on what concussion actually is. And we talk a lot about what it's not because a lot of people take home from their education session on Traumatic Brain Injury that – If I have any cognitive problems, I must have had a concussion – rather than the concussion being a discreet event.

And then it's really important when we talk about prognosis and expectations for recovery to be careful with how you talk to someone about the idea that the majority of people recover quickly without long-term sequella. Because if you're talking to somebody who believes that their symptoms are related to a concussion that they had three years ago – telling them most everyone gets better and then here they didn't – you have to be careful how you handle that. You don't want to set up and already say – Well then, you must be really bad. We can't figure what's wrong with you. We don't possibly know how to help you. So it's important to think about how you do that education.

It's also important to help them decode this prior education they've been given. If you think about the way the education mandates are here in the Army, for example, there is regularly-required Traumatic Brain Injury education – annual intake, monthly, all this kind of – I don't think monthly, but at least annual and when you first come in. And there is a metamessage we send that says – This is a really big deal and a really important thing. If you think about it, they don't have similar education sessions on AIDS or cancer or smoking cessation. And so it kind of puts this into a context that makes it much more scary and terrifying.

We then talk a lot about additional contributors to cognitive symptoms, using examples like how the adaptive responses in countries are maybe problematic Stateside. But we also talk about when your kids are preparing for a big test, you have them get a good night's sleep. You make sure everyone has a nice breakfast. Talking about these things to normalize it and put it into context about – You know, there are a lot of different things we can work on.

We talk about -- There is not a magic pill I have for you. And I think that there is a belief that we do have some sort of magic fairy dust or something; and it sets us up a little bit for failure, I think. But it's important to talk about – I am not doing this to you. I am helping you do this for yourself. And that's what our team is doing. And we really, again, focus on function.

We have several different tracks in our clinical program. And the stabilization track probably makes up the majority of the patients that we see. And this programming is individualized, and it might include group or individual therapy. And it's based on what the issues are when you present for your initial visit. So we might send someone to speech therapy for cognitive remediation and compensatory strategies. We might send them to physical therapy for headache or dizziness complaints. We have psychology embedded here; we might send someone to the psychologist for sleep, anxiety, PTSD, etc., if it's not provided elsewhere. And less often in this population, we might send somebody to occupational therapy for assistive technology or vision complaints.

Then the team will meet to talk about this patient. Well, we talk about all of our proteins once a week. We'll talk about how things are going; what are you all working on; is there something you're working on that can utilize a strategy we need to utilize across the board for everybody and different kinds of things like that.

A lot of people wonder – How much therapy is that? And so for speech therapy in general, people have one evaluation and maybe four weekly sessions. Physical therapy, more or less weekly for four to eight weeks. Psychology varies widely because the psychologist is going to be working on a really wide variety of things, so it's much more variable. When we look at our patient population, the mean length of stay is 62 days, which is about two months; and the median is right there about six weeks.

So we don't do this forever, for a really long time. Part of it – we worry about this, again, this sort of metamessage. Therapy forever – are we saying that we don't think you're ever going to get well, you're not going to get back to your life? But even though with this amount of time, we have good outcomes.

Another program we have is called the Cognitive Behavioral Education Strategies, CBES. And this is a manualized program. And this is really more kind of a psychoeducational group program. It's specifically talking about these attributions, cognitive dysfunctions, which tend to perpetuate symptoms. It's really designed for these very chronic symptoms, people who have had this problem that they attribute to a concussion they had six years ago, ten years ago.

So this is a group-based program, as I said; and it addresses all of these different fields – memory and attention, planning and organization, sleep, behavioral health issues. But it's not really targeted towards a specific behavioral health diagnosis. It's more utilizing some of the ACT principles. We talk about functional independence, activity level and community and social reintegration.

So here's what the schedule looks like. It's aimed at people who are working. We don't want to pull them out of jobs if we can avoid that. So it's a four-week program, 9:00 a.m. to 10:00 a.m., Tuesdays through Thursdays; and they'll have a brief, interdisciplinary evaluation for appropriateness.

So at the end of the day, we have decreased symptom burdens – not just of patient satisfaction, but we actually measure the neurobehavioral symptom inventory and a PCLM and a variety of measures pre and post. And people have fewer symptoms.

Also, there is a lot about patient satisfaction. I've chosen some of these comments, and I think that they were important because I think that these comments illustrate some of the important pieces you need to have. They need to feel like they are cared for. They need to feel like everybody was on the same page – this idea of working well together. And there is a lot of fear. I think some of the educational efforts have created a lot of fear. And they just want to be sure that I'm going to be okay. And then a really important thing about tools to move forward – tools so I can do this myself, empowering the self-efficacy and those sorts of concepts.

There are a lot of traps to avoid, which many of you may be familiar with as are we. We've learned about these. I've talked a little bit already about inadvertently undermining yourself, and then sort of creating this idea that maybe in the patient's mind -- Maybe I'm exceptionally broken or unfixable.

And then one of the other things that we fall into sometimes is trying to prove to patients that they are better. Look, your test is better; you must be better. Patients really should tell us that they're better rather than us telling them that they're better. We are rarely able to convince anyone that they are better, and they are more likely to be able to convince us that they're better.

And then one of the biggest issues, I think is the mixed messages. It's becoming less common, but sometimes they'll happen. Patients will come and say my psychologist said he can't help me until my TBI is better. And I know that people go to their [audio break] -- They can't help me until my psychology issue is better. And that doesn't help patients. It undermines the confidence patients need to have in us that we can help them by sort of sending them back and forth. And it

a lot of times, I think, alienates patients so that they don't get help at all. And I know that's not what any of us are looking for.

So in our team and in our processes, I think that here are some of the really key components. This consistency of message – that we expect you to improve; that we recognize that many things contribute to cognitive complaints, not just concussion; the aura of competence – We are experts, and we know how to help you, we know what we are doing; and caring and empathy – I believe you, it's nice to see you, how are you – all of those kind of just the social niceties, that someone is taking them seriously and trying to help them.

And for those of you who are familiar with some of the Clinical Practice Guidelines, they talk a lot about risk communication. And each of these is a risk communication strategy. And so they are really important, and they're helpful.

Here are just a few references – the Clinical Practice Guidelines. And I think that is all.

Thank you for your presentation, Dr. Bowles.

Let me remind everyone, if you have questions for Dr. Bowles or Dr. Hoge, please submit them now via the Question box located on your screen. We've gotten several good questions already, and we'll probably have time for another two or three.

Can we have our first question?

Dr. Hoge, while the first question is being brought up, you've really emphasized the importance of the autonomic nervous system and ways that the autonomic nervous system can be treated. Do you have any particular ideas with regard to the modalities that are effective in the comorbid population? I know our next couple of questions, as they come up, are going to be talking about heart rate variability training, per se.

From my experience treating folks with PTSD, relaxation techniques are always an inherent component of PTSD treatment. And there are a lot of different ways in which that can be accomplished. Heart rate variability is a nice technique that people can learn that helps them produce that relaxation response. But there are all sorts of other different techniques that are also just as effective or at least just as effective.

Our first question is actually specifically: "Are there heart rate variability biofeedback protocols that you or Dr. Bowles would recommend?"

I don't have any specific recommendations. I know that a lot of people find them helpful in producing that relaxation response.

I don't know of anything either.

I know there certainly are some proprietary protocols out there. And we'll take the next question.

In general, stress and stress inoculation techniques, diaphragmatic breathing, mindfulness, things like high heart rate variability are all tools that people can use in eliciting that relaxation response, which is one of the four most important components of treatment, in PTSD in particular.

Dr. Bowles, you indicated the absolute emphasis on education and patient empowerment. Is full recovery expected or optimal recovery?

In our clinic, we see the full spectrum of brain injury. We talk about we're always hoping for the best but preparing for the worst. And we are expecting people to improve. Now, whether or not they get back to how they were before is hard to say. But one of the things I think people forget about when they come to our clinic is the complaint – I'm not the same as I was before my deployment. Or the spouse – He's not the same as he was before.

And I think that the idea that you would be the same after deployment, even if you had no injury, is maybe potentially erroneous. You go to summer camp and you come back and you're different. And so I think that we underestimate the impact of some of these experiences. And from what I gather, deployment is very, very far from summer camp. And I think that we hope that people will be independently functioning and doing well, but whether or not they'll be the same is really kind of hard to say.

Dr. Hoge— (multiple voices) full recovery?

I don't use those terms necessarily. I talk with my clients more about the goals of the transition experience being integrated into the experience of who they are now and essentially learning to live with the experiences that they've had. Some of the experiences are very difficult. Some of them are very difficult to either recollect or talk about. They trigger major physiological responses. And the goal is for them to be able to go on and experience joy in life and have high functioning socially and occupationally despite having had those experiences. And that those experiences aren't walling them off or they're not allergic to their own experiences, so to speak - that they're able to integrate the experiences that they've had.

Thank you. So for the question – Is full recovery expected or do we consider optimal recovery? – I think from the perspective Dr. Hoge just mentioned, we really can consider not just the full trauma spectrum but also traumatic growth as part of that recovery. The next—

I also like to sometimes just drop terms like healing, recovery, coping, and talk more about navigating the homecoming environment or integrating one's experiences into who you are now or setting the goals. What do we really want to see for the future is the ability to be able to experience joy and go out and do things with my family without getting triggered. And so sometimes I just try to sort of drop the clinical lingo and just talk more about the person's experience. Rather than talking about traumatic events, let's talk more about those experiences that you had when you were in the combat environment and how you had the strength to get through that process. That's kind of the way I like to talk about some of these things.

More experiential than measurement.

Exactly.

Dr. Bowles, as a physiatrist where you have your range-of-motion and goniometer and everything can be measured and function is actually very scalar, do you consider it to be an optimal endpoint?

I'm with Dr. Hoge. Really what we are looking to help people find is meaningful things in their life -- to find meaningful activities, meaningful roles, to return to the things that make them "them." And that's really what we're looking at. I don't know that we have any particular – if you're

looking at particular instruments that we measure. We've tried a number of them, and that's probably a topic for a different day. But in this population, the main thing we are following administratively, metric wise, is we're following function; we have a quality of life inventory; we do follow the PCL; and we look at a measure we've developed here at home called the (inaudible), which looks at kind of symptom reporting and maybe kind of global stress count, things like that.

Our next participant wants to know: "Between the connection of poor concentration and poor memory, are there distinguishing factors between memory problems more connected to TBI when compared to PTSD?"

Well, from the research perspective, I'd say, "No." You look at neuropsychological tests and the types of tests that are done in research studies and the correlation of various objective measures in neuropsychological testing, most of the strongest predictors have actually been PTSD and depression rather than the history of concussion. But that tracks with what we know about all the generalized physical health symptoms. And I don't think that there are any particular neurocognitive measures that can be used diagnostically.

Amy, what do you think about that?

I'm not a neuropsychologist, but I would agree with you. I think that one of the reason there's so much struggle in figuring out how to measure improvement in traumatic injury, especially in the concussion population, is that there are not a lot of objective abnormalities in things like [audio break]. So I would agree with you.

Amy, do you find that the cognitive behavioral therapies that you mentioned under the importance of education sometimes are overwhelming for cognitively-challenged patients?

I don't know. I'm not the psychologist either on our team. I think he really approaches kind of a very stepwise approach to be able to get things so that the patients can manage it. There are a lot of studies in the behavioral health literature certainly about just getting people to come and stay in therapy and engage in therapy and complete therapy. So I think the foundation of a lot of what he's doing is a lot of different kinds of relaxation strategies. And I think most people are able to engage in that, even people with a lot of problems. And I think that's sort of his window towards figuring out what to work on next.

And as you say, that is done in an interdisciplinary model. So those assessments are shared real time with the rest of the team.

Yes.

Our next listener would like to know if there is a psychoneural immunologic approach to diagnostics and, if so, is there a use for a SpecScan?

From my perspective, there is a lot of research that's being done with functional neuroimaging and a variety of different types of functional neuroimaging including SpecScanning. I don't see a well-defined clinical role yet because even though you can see differences in aggregate when you're doing research studies with one group of people versus another group of people, trying to use the Specs on an individual basis – either diagnostically or to monitor progress – I don't think we're quite there yet, from my perspective.

Dr. Bowles?

I would agree. We don't use SpecScanning.

As you pointed out just a moment ago, there's a tradeoff between, if you will, over evaluating, over treating, over testing a patient and just listening to a patient. And I think that obviously that's what the basis of this discussion is, is best clinical approach to a very complicated patient.

Can either of you speak to the efficacy of EEG testing as a follow-up to the comprehensive TBI evaluation to assess memory difficulties, particularly in anger episodes?

I think that's a question for Dr. Bowles.

I can't answer that either I'm afraid.

Yeah, I don't have any experience with EEG for that purpose.

Other than perhaps partial complex or something.

Right, exactly.

But this is interactive; so if there are some listeners out there that would like to submit some Chat who have some understanding of EEG testing, particularly when it comes to memory and anger reported by veterans, please text us.

The next question is a long one, and I'll address it to both of you: "If funneling post-deployment service members through mTBI clinics permits self-identification and access to appropriate, team-based, collaborative, patient-centered, holistic care, function-focused rehabilitation care for Somatic Symptom Disorder without fear of mental health stigmata as an obstacle, is that not an appropriate way to address and treat the presenting issues? It's a long question.

Basically, what this individual is asking about is do mTBI clinics effectively address the generalized symptoms? And I also don't know that it's helpful to necessarily talk about these as somatic symptom disorders either. I really prefer to just think broadly. We're talking about generalized post-deployment symptoms, and there are a lot of causes for those symptoms. And my personal position on this or my personal belief on this is that we run a big risk of re-enforcing symptoms and re-enforcing the attribution of those symptoms to one specific condition whenever we send a person into an mTBI clinic.

Even if that clinic is delivering the care that Dr. Bowles described so well -- which is interdisciplinary, holistic and has all the components that one would like to see -- I think that we still run the risk of re-enforcing symptoms with that kind of specialty-focused approach. And I'm not saying necessarily that the answer is all that type of care should necessarily be moved into primary care either. But I think we may want to consider something like post-deployment clinics that treat the gamut of post-deployment symptoms, of which concussion is one.

I think we need TBI clinics specifically for seriously injured individuals with moderate and severe TBI. But when we start talking about concussion care weeks and months and years after concussions have occurred, I think that it would probably be more effective in the long run to have a focus on post-deployment clinics. Again, that's my opinion; that's not in any way and

official position, as you all know. Actually, none of what I've said is an official position; it's all my opinion.

Dr. Bowles, do you have an opinion?

I think that a lot of what Charles says is correct. I agree with it. I think that we need TBI clinics for the more severely injured people. And I think what to call these clinics and how to set them up and how to approach them is really a challenge. I think there are a lot of different names. When our clinic first started, we were the TBI clinic; and we've switched to being the brain-injured rehabilitation clinic. But the kind of stovepiping of the way money goes or the way the hospital is organized – these sorts of things – kind of create these structures.

I don't know what the best structure would be to be. I think ideally, concussions should be managed in primary care. And frankly, we encourage acute concussion to be managed in primary care because we're a rehab clinic. We want to look at rehab. And so we're more set up and geared towards people who have kind of more chronic issues and complaints, like I said, regardless of what the ideology is. But we'd like there to be kind of a suggestion that they had a brain injury because that's what we're really supposed to be doing.

But I think that the idea of a post-deployment clinic is a good one. And I know it's been deployed in a lot of different places. But one of the other things that I've noticed is that it's easier for some people to come into the clinic, as Gary alludes to, to come into the TBI clinic for their care. Even though the only person you see here is the psychologist and the only thing you do is prolonged exposure therapy, but you're in the TBI clinic. And over time you can get so that the service member realizes – You know what? I have PTSD; I'm working on it; I have the tools to take care of this and to move on. But to get in the door and to come in for the second and third visit, sometimes it's easier with these different names.

So I don't know what the best way to name it is. And I don't know -- I think it's a great question.

I also want to add – and I've written quite a bit about this, so it's widely known what my view is on this. But I think we have an inherent problem with mild, moderate and severe TBI being lumped under the term TBI. Because it's equivalent to an ankle sprain and an above-the-knee amputation being lumped under the rubric of traumatic leg injury. Clearly, those are not in any way similar. And just as a simple concussion with transient alteration of consciousness of a few seconds to a few minutes is in no way the same thing as a severe or penetrating brain injury that leads to permanent coma in some cases.

So granted, there may be physiological processes in the brain that are similar between an ankle and a serious traumatic leg injury. There may be physiological processes that are the same also. But when we start lumping them into one category, clinically that has meaning. Labels have meaning. Labels lead to expectations and perceptions of illness. And there's actually very strong literature on the impact of illness perceptions on functional outcomes.

So I've argued for years that we need to continue to call concussions, concussions and reserve the term traumatic brain injury for moderate and severe (inaudible). There are a lot of reasons why people have not been willing to go in that direction. But I think when we start talking about functional outcomes, there's fairly good reason to be thinking about that.

What about chronic recurrent concussions that a lot of our veterans experience? Is that a different comorbidity?

I think that there is clearly a literature on multiple concussions and repetitive concussions increasing the risk both of generalized symptoms or symptoms like headaches and potentially long-term outcomes. But I think there are also a lot of other factors that go into some of the long-term outcomes. So we've got a ways to go on that, on really making the attribution and looking at the relative impact of different numbers of concussions or types of concussions.

Our next question relates to the treatment of cognitive fatigue with amantadine. Would either of you like to comment on the use of amantadine for cognitive issues related to concussion?

In our clinic, we rarely prescribe anything really because of the sole provider things and we're not primary care. But I'll tell you that we rarely recommend it. We use amantadine a lot in our more severely injured population, but very unusually in a concussion group.

How about other psychostimulants?

We very rarely give psychostimulants to the concussion group?

Dr. Hoge?

I would agree. I don't have any experience with amantadine, and I rarely use psychostimulants in this group as well.

Our next question is directed to Dr. Bowles: "Are patients within the stabilization track seen on an individual basis at the same time as they attend group session?"

Yes, right now most of the stabilization track is individually based. It sort of depends on the kind of patient flow and the patient census and kind of what all is going on about whether or not we have groups or individual or both. But generally, the stabilization track includes individual appointments. And right now, and for the last number of months, it has been exclusively individual appointments.

While we're on the topic, would you care to address the CBEST? Do you consider that the same as cognitive rehab?

Not really, I would really consider CBEST to be more a psychoeducational group – although cognitive rehab is such a big topic. And certainly there are some compensatory strategies covered in the CBEST talking about calendars and organization and lists and priorities and things like that. But I would not consider it cognitive rehab in the more traditional rehab sense of the term.

We have a study that we just completed looking at cognitive rehab. And the psychological components from CBEST are fairly similar in one of the treatment arms, and there are some components of CBEST in the score protocol. But they are not – I don't think anyone would really – it certainly doesn't have any restorative parts in it. It's all compensatory strategies.

Thank you, Dr. Bowles.

We have time for perhaps another two or three questions. We have two or three questions remaining.

And this is in reference to your clinic as well, Amy: "How many patients are you currently treating? How long is your weekly meeting with them?" And the individual wants to know a little bit about the logistics associated with that.

Our census for the stabilization track is around 50 patients at a time, which is a lot of patients to cover in an hour. And it is an hour that we talk with them every week. The way we do this logistically is we have a Data Management System that kind of helps keep track of the list, and so we run the list altogether as a group. And we have the case managers. Most of these patients are in the warrior transition battalion, and so the case manager is calling on the telephone, and then we kind of run the list.

We can generally get through the list because the way it ebbs and flows is some patients have more issues going on right now than others. And so it usually ends up that we get through most all of them unless there is something unusual going on with a lot of patients. Also because we're co-located, there are a lot of hallway conversions and – Hey, do you have a minute? Or if somebody needs some really special stuff, in all likelihood, if they need something really unusual, they'll be pulled out of that track and put in a different treatment track.

So at the stabilization meeting and really all of our team meetings, we talk about what are the goals that we're working on? What are the strategies that – say, psychology has come up with a strategy because this person really kind of just gets really kind of perturbative and can't get off of the topic or it gets really catastrophizing. I think there's one gentleman who is always sort of catastrophizing. So the psychologist has worked with him; and they have this kind of joke between them where they'll say, "Who died?" And so he'll share that with the team. And so when all that happens in the context of therapy – Well, who died – or whatever the kind of strategies will be so that we're all utilizing the same things, re-enforcing the same things.

The same with kind of going the other direction from speech or from PT or OT. So that's kind of how the meeting – the meeting is generally pretty focused. One of the reasons that we can have it so focused is because my team has been together has been together for so long, and we've kind of hashed a lot of this out. We've come up with a lot of these different treatment programs and talked about it. And everyone has the same kind of foundational and fundamental knowledge and views, and so we're able to do it that way.

We do not document this meeting. We don't write notes. There's no way we could write notes for this high volume. And we've discussed that and debated it because of all of the beans that are being counted, especially these days. And this is an expensive meeting because it has all of these therapists and professionals in it, and their time is expensive. But we've felt like it is worthwhile; and if we were to add documenting, it would really kind of be more expensive because it would slow us down considerably. It would take out access for patients. And so that's an administrative decision we've made in order to accommodate.

Regardless, your treatment plan is a culmination of all of the various disciplines. So even though there is not individual credit given, the treatment plan itself reflects the contribution of all your providers.

Exactly, exactly.

This next question is also related to the multidisciplinary versus interdisciplinary approach: "Recognizing that co-located, multidisciplinary services report a best practice, for those of us

working in locations where that is not yet possible, do you have any suggestions on sequencing services or ways to best determine appropriate sequencing of services?"

When we started, we did not have the little nirvana we have now in the basement of SAMSI. We were not a mission that they had planned for. And so we ended up having services all over the hospital. We had to get an extra clerk in order to escort people since we couldn't have these patients showing up at 27 different locations since we didn't have group rooms, and it was really exceptionally difficult.

But you can still do it, but you have to get buy in from whoever is in charge of the bean counting and administrative things; but it takes extra time. It takes extra time to be on the same page. And these meetings are that much more important if you're not all co-located and you can't have that quick conversation in the hallway.

But there's no substitution for this communication. And a lot of times communication in the medical record doesn't quite meet the intent and the need and is not as efficient as sometimes a phone call or even just a quick meeting. So putting things in order sequentially, I think a lot of it is this partnership with the patient about -- What is the most important thing to you? What are your priorities? What is bothering you the most? And then sort of sorting that out -- What is causing the biggest functional problem for you?

And I think a lot of it also depends on the strengths and weakness of the programs that you work with. If PT has a six-month wait or a six-week wait, you might want to -- You know what? Let's start with this instead, and then we'll do the other.

This is such a unique situation that I know it's probably hard in your situation -- I don't have that. What do I do? But I think that there are a lot of opportunities to help build this partnership with the patient and help them figure out -- What do you think is the most important thing?

And a lot of times if you start exploring, somebody has got an interest -- some kind of go-to person -- and a team can start with two and then grow from there. But it is not easy. It is not easy. We are very fortunate to have all of the support we've had here and to have it set up so nicely for us.

Absolutely, the trust and the relationship in a patient-centered model is critical. And I think that all of the providers that are listening probably find that challenging in terms of the tie that they have with the individuals to be able to establish that. I know at the NICoE, we have the luxury of quite a bit of time -- four weeks -- which, given that model, we are able to offer a phased or stepped approach. The first step or phase is obviously safety. And part of that safety is both psychological and physical, as well as ensuring sleep and trying to manage pain. Of course, pain and sleep are ubiquitous.

So from a stepped or phased approach, as Dr. Hoge was mentioning in terms of step care, probably pain, sleep and safety in that order. Sleep, pain -- all of those components -- in the first phase.

We have time for just a couple more questions, and we'll shift gears here. One listener wants to know about the use of acupuncture for treatment. That's obviously something that as an acupuncture practitioner, I can address as well. But I'd like to hear, Dr. Bowles, how you use integrative medicine techniques in your facility.

We don't really use a lot of integrative medicine techniques. Those are available, but we don't generally utilize them.

This is probably the opportunity for another DCoE webinar in terms of (inaudible) or integrative medicine techniques because many, many patients find them useful. At the NICoE, we actually expose the patient to a great many techniques and really provide an intervention that is meaningful for them. Many of the patients do find acupuncture meaningful and helpful. And I know that Colonel (inaudible) has trained several with battlefield acupuncture for pain control. In fact, that is currently a joint incentive program that is available to come to your MTF and actually teach providers on how to do battlefield acupuncture.

But more sophisticated or more technical acupuncture is obviously delivered by someone who has much more training. So acupuncture, for the question, is an important modality; but it is a modality that unfortunately is not ubiquitously available.

And I think we have time for one more question – nope. I'm getting the wrap it up.

I would like to take this time to thank Dr. Hoge who, in the last few moments, unfortunately had to step out for a flight.

Dr. Bowles, thank you very, very much for your participation and contributions.

I'd like to do a couple housekeeping notes to help improve future webinars. We encourage you to complete the feedback tool that will open in a separate browser on your computer. To access the presentation and resource list for this webinar, visit the DCoE website at [www/dcoe.mil/webinars](http://www/dcoe.mil/webinars). An edited transcript of this closed caption will be posted to that link. and an audio recording of this webinar will be available as a downloadable podcast.

The next DCoE Traumatic Brain Injury webinar topic is Family Functioning and TBI; and it's scheduled currently for April 10<sup>th</sup>, 1300 to 1430, that's 1:30 p.m. to 2:30 p.m. Eastern Time. The next DCoE psychological webinar topic is Parental Deployment and Children's Psychological Health, and that's scheduled for April 24, from 1300 to 1430.

Once again, I would like to thank our presenters, Dr. Hoge and Dr. Bowles, for a wonderful presentation.

Thank you for attending and have a wonderful day.

Thank you, this concludes today's conference. Participants, you may disconnect at this time.