

**DVBIC Monthly Webinar Series: Hot Topics in Traumatic Brain Injury**  
**TBI Global Synapse Town Hall: Your TBI Information Connection**  
**Nov. 20, 2013 – 2:30 p.m. to 4 p.m. EST**

Welcome to today's conference. At this time, all participants are in a listen only mode. Today's conference call is being recorded. If you have any objections, you may disconnect. I will now introduce your conference host, Dr. Alison Cernich. You may begin.

Thank you.

Good afternoon and thank you for joining us for today's DVBIC November webinar. My name is Dr. Alison Cernich. I'm the Deputy Director for the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury. I'll be your moderator for today's webinar.

Before we begin, let's 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 Platform. Should you experience technical difficulties, please visit [dco.mil/webinars](http://dco.mil/webinars) to access trouble shooting tips. There may be an audio delay as we advance the 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 technical or content-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 held during the last half hour of the webinar. Our panelists and I will field as many questions as time permits. Please note that Continuing Education credit is not available for this event.

I will now move on to today's webinar topic, TBI Global Synapse Town Hall, Your TBI Information Connection. In August of 2013, DVBIC presented Traumatic Brain Injury Global Synapse: a TBI Summit Without Borders, a groundbreaking, virtual, multidisciplinary training event for the Departments of Defense and Veterans Affairs and military health care systems' health care providers. In this webinar, a panel of presenters will answer selected questions, plus additional questions submitted during the webinar relating to the assessment and screening of TBI, symptom management, pain, headache, sleep disturbance, management of the complex patient and the role of rehabilitation therapy.

Webinar participants will learn to articulate the incidents of mild traumatic brain injury and persistent post-concussion symptoms, identify evidence-based strategies for symptom management in various clinical settings, discuss resources and education tools used to develop an interdisciplinary treatment plan, explain strategies for patients to overcome obstacles to successful reintegration and promote the expectation of recovery in the acute phase of recovery from concussions.

We are very fortunate to have three distinguished panel members for today's webinar. You actually only see three people currently on the screen because one of our participants, who I'm about to introduce, will be joining us; but he may be a bit delayed due to transportation issues.

Colonel Sydney Hinds became DVBIC's National Director on July 1, 2013. Previously he was the Deputy Director of the Armed Forces Radio Biology Research Institute for Military Medical Operations, the In-theater Neurologist in Afghanistan, and Chief of Nuclear Medicine Services at Walter Reed National Military Medical Center. He was the Nuclear Medicine Integration Chief for the Base Realignment and Closure Process that combined the former Walter Reed Army Medical Center and National Naval Medical Center.

As National Director, Colonel Hinds oversees all aspects of the organization's mission, which is to serve active duty military and veterans with traumatic brain injury through state-of-the-art medical care and care coordination and innovative clinical research and educational programs.

Lieutenant Commander Cathleen Shields' career path has led her through a variety of clinical, management and administrative experience in hospitals, home health and skilled nursing facilities. She's a certified brain injury specialist and a clinical specialist for adult dysphasia and neurologic diseases. She

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received her bachelor's degree in communication disorders and her master's degree in speech language pathology from Pennsylvania State University.

Dr. Stephanie Maxfield-Panker has been working at the Office of the Surgeon General since 2011, and has expertise in program management and policy related to concussion care. She holds a Ph.D. in Neuroscience from Georgetown University and a doctorate in Physical Therapy from Baylor University. She conducted her dissertation research on motor learning, motor control, and rehabilitation of stroke using robotics and non-invasive brain stimulation at the National Institute of Neurological Disorders and Stroke and the National Institutes of Health in Bethesda, Maryland. She practiced orthopedic physical therapy and is board certified as an orthopedic clinical specialist.

Thank you for your participation and welcome soon to Colonel Hinds and also to Lieutenant Commander Shields and Dr. Maxfield-Panker.

Thank you.

So what we're going to do is start with the first question. And what I will do is for those questions that we're starting with, some of them we may just bounce around. And I just want folks to be aware that we may be moving from person to person with some of the answers.

So the first question is: "What is the source of the TBI injury statistics presented and how are they collected?"

I can take the beginning part of that question. The Defense and Veterans' Brain Injury Center has for some years now been the office of responsibility in charge of collecting and publishing the statistics related to traumatic brain injury for the public. That data is coordinated with the Armed Forces Health Surveillance Center, which is the major office that's responsible for surveillance data for the Military Health System.

I'm just going to give a minute for Colonel Hinds to get seated, and then I'll continue. So this is Colonel Hinds. You've been waiting patiently. And he can also sort of help me to finish off this answer.

As the Office of Surveillance and DVBIC works with AFHSC, they gather information from the Medical Records System; they gather information from the Joint Theater Trauma System; and they gather information from throughout the department, especially as it relates to some of the concussion data that we get from event-related reporting, meaning that people are screened after an event where they may be placed at risk for concussion. And so after that collection, they are then quality assured; and then they are vetted through the AFHSC process and also cross-walked with case definitions to make sure that they do actually meet the diagnostic criteria. And those are the data that are published on the website.

Colonel Hinds, do you have anything to add on that?

I just want to back up what you just said; there are many areas and many sources from which we glean data. That's the primary source; but we work heavily in conjunction with the services in the VA to gather almost any type of TBI data that's out there and help our stakeholders answer any questions that they might have. But AFHSC is our primary source for that information.

Perfect. So for our next question that we've received: "Are Military Acute Concussion Evaluation (MACE) results placed in a database?"

And I'll put that to Colonel Hinds.

The Military Acute Concussion Evaluation has undergone many policy execution phases. We instituted – and we didn't have a clear-cut electronic repository for it. Currently in-theater, the MACE card is electronically available through an Ames form through Alta-T in-theater and is stored in that fashion. Prior

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to that, a lot of it was just hand copied and then perhaps transcribed into an alternate available only through evaluating the record rather than being mined by any type of data extractor.

Right, and I think that there are also – which points out another point with this, which is before that electronic record, we either used paper and pencil that might have been scanned or typed in manually. And so one of the efforts that's currently underway in the Department of Defense, in collaboration with the Department of Veterans Affairs, is to look at how do we extract some of that data that's not computable and get that into a data system as well, one, so that it's part of the person's record; and, two, so that really it could inform, if we were to look at it for our programs, how we improve them in the future.

And so if we can get some information about that initial point of care, it really may help us to move forward. So there are efforts underway in the departments to make sure that we are capturing that information and that we are trying to get that automated or at least in a database so that it's useful to the provider going forward.

Anybody else from the panel want to comment on that? Okay, fantastic.

So the next one is: "Is there an ideal number of visits for the speech pathologist per week with a service member who is ready to address all the cognitive issues that usually accompany persistent mild traumatic brain injury sequelae?"

And for that one, I'm going to turn to our fabulous speech-language pathologist, Cathy Shields.

Thank you.

There's really not a one-size-fits-all; it depends on a lot of factors. Specifically, what are the symptoms that the person is showing? How severe are they? How much are they affecting the person's life? So I think if you're looking at a catchall of a number that it's not there. But ideally, two to three times a week is what people are seeing. But you also want to look at how well is that person motivated to participate in therapy. So if they're not participative at that point in time, you might want to back off and do it a little bit less frequently.

How much is it time-sensitive? Does somebody have a goal of getting back to work in a quicker timeframe so that you maybe want to do a little more therapy to get them ready faster. So it really is a number of different – just like physical therapy, it just depends on what that person needs.

Fantastic, is there anything else that anyone else wants to add to that one?

Well, I would just say that there are also lots of apps out there and things that SLPs and OTs can help their patients as they equip them for going out and between visits and things that they can see if they are efficacious in helping them keep track of their appointments and things like that. So there are lots of technological advances, even for those that aren't able to come in on a regular basis for their one-on-one.

And there was also, interestingly, a published practice guideline that was jointly published between DOD and VA speech-language pathologists that talked about addressing some of the common symptoms accompany mild traumatic brain injury sequelae, and that document also gives some resources and some references to some programs that might be useful just for that particular population. So I think those resources are out there, and there are also some hubs that really do speak to those self-management devices that might be useful to a veteran or service member.

So I think we've covered that one fairly well. If we can move to the next question, which I as somebody who can speak to this, will answer myself; so that should be fun to do: "How can the Department of Veterans Affairs staff and researchers access Automated Neuropsychological Assessment Metric (ANAM) scores for clinical research purposes?"

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For clinical purposes, there is actually a Help Desk. And I'm sure that we can share that with the audience through various means. Is there a link to the Help Desk from the website at DVBIC? I don't remember off the top of my head.

I think on the looping screen.

On the looping screens there is. So if you go to [www.dvbic.org](http://www.dvbic.org), there is a link that will take you to the ANAM Help Desk. The ANAM Help Desk can transmit ANAM scores for individual patients with their release to a VA provider. We are working in the VA to determine how we can socialize that better among the providers that would need access to that information so that they know that that resource is available to them.

For clinical research purposes, that would probably have to go through an approval process with that specific Army office that runs the program. And so there would likely have to be an approved IRB, some releases, and it would likely be with a de-identified dataset rather than a full dataset, though I don't know that there are established permissions to do that. So that would have to be individually addressed probably on a protocol-by-protocol basis.

Dr. Maxfield-Panker, would you have anything to add to that?

No, I think you're spot on.

All right, so hopefully that answers the question for those that submitted it. So we'll move on to the next one: "Is it important to incorporate family members or coworkers in the treatment of TBI?"

So I will be passing that on to somebody on the panel.

I'll take that one first.

Fantastic.

So obviously, the first thing you want to do is you want to make sure that the patient is okay with you incorporating family members or coworkers because you want to make sure that that's comfortable for them. But if it is, ultimately you want to have as many people in that support system as possible. So you definitely want to get in the family members or any team members involved.

You want to make sure that they can provide support in that recovery process and helping to carry over. As we said earlier, if they're having therapy a couple times a week, you want to continue that process throughout the week. And by incorporating family members or loved ones into that, they can follow through with whatever strategies. By telling people what apps or things that you're trying to have people using, then they can learn how to use those apps as well and start helping them carry that over in their day to day.

Coworkers – it's important, especially if the person is looking to go back to work, if the patient is open to it, it might be helpful to let a boss or a team member know what strategies they're using so that they can incorporate it into their day-to-day work life and people can help support them in that.

Absolutely, the other thing is that at least through VA, there are some job coaching resources that are available. And so we can make job coaches available if the veteran is interested in order to go to the workplace and talk through some of the strategies that may be useful for the veteran in the workplace and also to help potentially set up a workspace for them. So that if they're having symptoms that are because of noise interference or because of balance problems and they need an evaluation of their workspace. That is a possibility for VA to assist through the Vocational Rehabilitation and Education Service.

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So there are a number of services that are out there. And that's actually also offered by one of the veteran service organizations will offer job coaches that will go out. I can't recall right off the top of my head which one that is, honestly; I've just thought about that.

But there are some services out there that will provide job coaches to go. And that's obviously, as Commander Shields said, some folks are very much happy to have that workplace integration and happy to have people participating in their treatment. But obviously, it's the patient's treatment. So if they are not comfortable including that, then that's something that you're going to have to work through with the patient.

Anything else?

The only thing that I'll say is that the Defense Centers of Excellence for Psychological Health and TBI, the Division Defense Veterans Brain Injury Center, has a 15 year longitudinal study looking at the effects of TBI on the caregivers; and so that hopefully we'll have some information in a few years as to what that impact on the caregivers has been for traumatic brain injuries sustained.

Fantastic, sir, thank you.

"Some providers seem quick to dismiss post concussive symptoms and put every patient in the post-traumatic stress disorder (PTSD) category. How common is it for both to occur at the same time?"

I'm going to throw this one to Dr. Maxfield-Panker.

Sure, so it is fairly common in certain populations, certain patient groups, to have an overlap. There was actually a study in 2009. The lead author was L-e-w, Lew. And that team was looking basically at OES/OIS veterans and comorbid conditions to include traumatic brain injury, post-traumatic stress disorder, as well as chronic pain. And they found significant overlap in all three of those diagnoses.

Actually, the middle of the (inaudible) diagram was actually about 42% of their sample had all three at once. And again, this was in a study of veterans they looked at. So the mechanism of injury for traumatic brain injury certainly has an effect on whether someone is more likely to have post-traumatic stress as well; but there is also a group of patients that are not going to have post-traumatic stress. So to equate them, I think, does a disservice to those with PTS, to those with TBI, and to those with co-occurring.

Right, and there have been multiple since then. The Lew study was one of the definitive studies. But there have been studies since then that show that there is a range of those veterans or service members that are diagnosed with both that ranging across studies, depending on how the cases are defined, anywhere from 10% to 37% to 42%. And it really depends on whether or not those studies even rely on screening versus full diagnostic data.

And so you really have to evaluate from the literature, what are we talking about here? Did the person screen positive, or did they have the symptoms? And I think this is really when the clinician has to take that role of making sure that they actually meet the diagnostic criteria and really evaluating because there are some symptoms that really are distinct to PTSD and that are not found in TBI. So for instance, flashbacks are not a common symptom of TBI; they are a common symptom of PTSD. Frequent nightmares – though there are may be sleep disturbances in TBI, nightmares are not the thing that you will hear about the most.

And so I think this is where even though you're dismissing the post-concussive symptoms, you can have a lot of symptoms and not meet criteria for a diagnosis. And that's where I think the clinician has that role of making sure that somebody is meeting those diagnostic criteria sufficiently to meet that diagnosis being put in their chart. And so I think that's something that the clinical interview becomes extremely important in that case.

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Great point.

So, Colonel Hinds, what do we know about the natural history of deployment-related concussions?

Let's talk about head injuries and concussions across the board. What we do know, the vast majority of concussions happen at the home station or in the in-garrison study. So only a smaller percentage are happening in-theater. Since about 2009, the Institution of Concussion Care Centers, the directive type memorandum 09-033, the incorporation of that into the Department of Defense Direct Instruction 6490.11, Institution of MACE Evaluations and the Clinical Practice Guidelines. What we're seeing is that still the vast majority are being returned to duty fairly quickly. We have a lot of education to ensure that return to duty isn't just time-based. It is symptom-based and that folks are ready to go back. Our concussion care centers within-theater have been doing a phenomenal job, with a 95% to 90% return-to-duty rate.

And again, I want to emphasize that the symptom-based approach, these folks are having rest that's supervised. And they have a progressive return to activity to ensure that they're ready to go back.

Having said that, there are a number of research studies going on taking a look at what's been happening in-theater and seeing what happens long term. I think what we're going to find is that the best way to take care of concussed patients is identifying them quickly so we have an event-driven rather than a symptom-driven identification process that's non-medical and leadership heavy to get those folks identified and then evaluated.

Concussion or not concussion, those folks who are deemed to be not concussed go back to their jobs. Those who have been concussed have a prescribed regimen of treatment and care from the Clinical Practice Guidelines. So natural history in-theater -- huge success story. I think we're going to have more data to dive into to see what the long-term effects. And certainly, as most everyone has heard from either the lay press or the medical journals, we're trying to find out what that association with repeated head injuries and nerve degenerative disorders. And I think those studies are ongoing and are very important.

And just as a follow up, how many of the brain injuries that are diagnosed are mild?

The vast majority -- so we're looking at over 80% are mild TBIs or concussions.

So the good news story there is that most folks after their concussion, especially in-theater where those protocols are in place, are getting back to duty on a symptom-based protocol. And so folks are recovering; and they're able to resume their normal day-to-day activities, which is a huge change from a couple of years ago where we didn't have that information to know that that was happening.

Absolutely correct.

I'll throw this out to the panel: "When someone reports only "seeing stars," is this sufficient to diagnosis concussion?"

I'll start with this one. In the DOD, diagnosis of concussion is made when there has been an event that is a potentially concussive event. And then when someone has either post-traumatic amnesia, a loss of consciousness or an alteration of consciousness. That alteration of consciousness is really traumatic to try to define, especially for a lot of our service members.

So some examples that might be described when you're trying to communicate with the patient are: Did you see stars? Did you get your bell rung? But it's not necessarily definitive. So if someone has had an event and they say, "I saw stars afterwards," I think that the communication needs to follow on from there to get more information about was it an alteration of consciousness because it is a bit of a hard term to describe for patients.

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Especially given some of the events that people are involved in – and again, that's where a good clinical interview can really be a huge resource. There's a great asset that we have out there for example clinical interview by Wendy Law that is going to be on the DSBIC site, again soon, where she walks through even an alteration of consciousness event with a patient. And what's great about that is she talks about the difference between responding to an explosion, which of course can throw anybody off with respect to how they're feeling in the moment, and a real alteration of consciousness where the person feels like they are disoriented, they can't respond, etc., and getting that into lay language for a patient. So seeing stars, I agree, may be an indication; but there's a lot of follow up that comes in after that in the clinical context. So it's really beholden on the clinician to try and follow that up.

So let's move on to the next one: "How do common symptoms following concussion interfere with successful reintegration such as school, work or day-to-day activities?"

I'll take that one. When you think of the common symptoms following a concussion, one of the major physical symptoms is a headache. So obviously if you're walking around on a daily basis with a headache, it makes it very hard to pay attention to your daily activities and pay attention in school or work.

From a cognitive standpoint, people after concussion have defined problems maintaining attention and having poor memory and higher level thinking skills. So if you're in the school situation, learning new information and paying attention to a class, especially in a college setting where the classes might be longer, paying attention to a longer lecture is very hard to attend to.

So some of the strategies – I'm going to the next question – some of the strategies that we would give to these patients, as Dr. Maxfield-Panker already mentioned, the apps, the things that we can do to help people manage the schedule and remember when things are due and remember what their course schedule is. But things like pen and paper, writing things down, taking notes, making sure – again, if they're comfortable with their professors or their employers knowing some of the strategies of, "I might need to sit away from the window because the light is bothering me. It's making my head hurt more." And just taking extra time to take an exam are some things that you can work on with the school.

We just recently put out a Back To School Guide for service members returning to school who have sustained a concussion. And we've taken them through, step by step, a checklist of things they can do and how they can access support in that setting and become more successful.

Dr. Maxfield-Panker, anything? I know you contributed the apps earlier; so any other things that you would contribute from that perspective for reintegration?

No. I'll say, I just don't want to talk that much; but I will say another thing that I used to work with veterans about was they would say, "I don't want to use all these reminder systems."

And I would say, "You know, you've got this neat Smartphone or this great iPhone or whatever. Everybody uses those devices now, especially in their cohort. And so it doesn't look weird for you to be looking at your Smartphone. And so if you don't remember where you parked your car, there's a Park Your Car app that's location based that will like home you back into it. You could be checking your calendar for all anybody else knows."

And so normalizing that for them as well and normalizing some routines -- I generally forget where I put my keys myself. And so it is normal for you to have a hook by your door for your keys; it's a routine. And so having some routines I think also is a major focus of helping people to reintegrate. If something throws you off your routine, you have to teach them some flexibility because not everything is always going to go according to plan. But one of the things that's always great is to have them work with their family or just work with themselves on, "What's the routine thing that I need to do to make my day successful so that I don't start off not being able to find my wallet, not being able to find my keys, and the rest of the day is downhill from there because I feel like I can't remember anything?"

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So sometimes even just starting with those basic things gets them into that routine and then allows them to help set up routines that work. And I always normalize it and say, "There are a lot of people – given all the things that people have to do every day – there are a lot of people who use reminder systems and use calendars and use their Smartphones, and so you're no different. And so I think normalizing that makes a big difference as well.

And looking at time of day effects too in the rehab environment, that's fairly common to if you're in college organize your classes so that your tough ones are in the morning if you do better in the morning or after a nap in the afternoon if you have that type of flexibility – so knowing that the circadian rhythm of your symptoms in particular and how to best manage that.

And, you know, that points out a great point, which is sleep; and we're going to potential talk about that a little bit later, but also making sure that you're ready for your day by actually getting the sleep that you need because that's going to impact so many other things. So if you're fatigued, all the cognitive symptoms that you have are going to be worse during that day. So give yourself that little bit of baseline to make sure that you're ready and prepped, and I think that's a really great point.

So we'll move on to the next question: "I'm a provider in a clinic treating active-duty soldiers who deployed one to three times. Many have long-standing sleep, pain and other behavioral health issues that have been only marginally addressed. What is the best way for a provider to develop a concise, yet effective plan to catch up on their needed care?"

And I'll throw that one to Dr. Maxfield-Panker.

I'll be happy to start. This is kind of a tough one, and I think one that's commonly encountered out in the field. I actually reached out to some of our Army providers out in the field to get some other opinions. One of the opinions I got was that really when someone has had those long-standing issues and maybe they've been addressed and maybe they haven't been addressed, we really need to build that trust with that patient again.

And so at that first visit, that first visit is a little bit longer. You really have to get the buy in with the patient that you are going to attempt to address multiple issues with them and really find out, have them tell their story, find out what medications they've tried in the past that they haven't had success with or maybe they had side effects that they were not able to be compliant with that medication. Try to find out the why of why they think that's it's been marginally addressed. And that time spent up front will pay for itself in the long run because you'll get the buy in. As we know, the best evidence for certainly mild traumatic brain injury includes education. So that education piece up front is really critical, especially when they haven't had, perhaps in their mind, a successful experience with the medical health system to that point.

I think the other thing that I used to tell -- this was a coming thing that would happen from the VA side -- which is I would have folks come in after two years or so, and maybe they've never told a provider that they were having these issues or they got portions of them addressed. And one of the things that I would also say just from a rehabilitation perspective, it's no different than if you have an ankle sprain. If you have an ankle sprain and you let it go for two weeks, you're going to have a much more significant injury than if you have the sprain and you get it addressed more immediately. The same with a fracture -- well, you may not be able to walk on a fracture -- but that being said, the analog is there. The longer you've let the injury fester, the harder it may be initially to see that progress because you're going to have to deal with that initial getting over the hump of starting to treat the bigger issues.

And so sometimes I tell them, "It may take us a little longer than you'd like, so stick with me and tell me if we're addressing it and it's getting better because if it's still not getting better, we may need to accelerate. We may need to do different consults than what you currently have. We may need to get other things evaluated. Maybe we're not treating the actual thing, and we may need to do some more diagnostic work." But ferretting that out with the patient and checking in to make sure that not only that initial, but

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then following up and really making sure that you've established the trust and you keep the trust by trying to make sure that all of those symptoms are addressed, I think, is really key with folks who haven't felt like everything's been taken care of.

And also exploring maybe they do need something that's a little bit more intensive for a bit. That's another way to potentially accelerate, is to change the setting of treatment if it's warranted.

I think the other thing is as long as it's okay with the service member or the patient, that is this is a good time where getting the family members or the support system involved is key. If you're looking down the road and trying to remember the things that have happened, your family might have a very different picture of what life has been like over the past six or seven or eight months than what you're reporting. So at this point, getting that history from the family and kind of comparing it to what the patient is saying is an ideal situation.

The only thing that I'd like to add is that this really underscores the evaluation. And getting to our patients quickly and instituting care, what we do know is if head injuries go unaddressed and you have maybe yet another concussion before you're better, your likelihood of being one of those 85% to 90% who get better in a short period of time worsens. It may take you a longer period of time. So being identified, getting the evaluation and treatment early on is key.

Once you have them, time really is what you need to invest in your patient -- taking a look at their medications, taking a look if they're doing those things that are just exacerbating their symptoms. It may be that you are the first provider to really give them a look-over, and maybe you can be the hero and not add another medication. Maybe you can simplify the medications; maybe you can teach them sleep hygiene. Any of these things I think will help take what seems to be a very complicated patient and give you a patient that you can help.

And then as you need, as you're looking at the symptoms and if you feel you're not getting anywhere or you don't feel that you have a full range of knowledge in regards to concussion care, reach out to the specialists in your community and try to utilize them as a good sounding board for what you're trying to do with your concussed patients.

So I think knowing that, then we're going to move to a specific symptom, which is: "What are the efforts for us to communicate with service members and veterans to let them know what we're doing to help them with cognitive impairment resources and support?"

So I'll probably start out with this given my background. The biggest thing that I think – the way we communicate that, one, is making services available. And so making sure that the patients and other providers are aware that if they do have those issues that there are resources, both within the military health system and within the VA, to assist folks with cognitive impairment. So there are some major programs that are innovative, like those at Walter Reed. But there are also boots-on-the-ground folks in OT and speech language pathology and even PT to some extent, depending on what other therapies if you have really a transdisciplinary team that's working on the same goal, many of the times people will be working on cognitive impairment in all those sessions.

There are also neuropsychologists that are available both in the VA and the DOD to provide those services. Not only that, but I think there are also a number of – as we were talking about before – apps and/or other technologies that folks can use as resources, that speech language pathologists train on, that nurse psychologists train on, that put things in the person's pocket – so again, where did you park your car, what are the things that you need to do today – just a to do list, calendar reminders. There are specific apps for medications that integrate with your task reminder so you can remember what medications you're on and when you need to take them.

And so I think that there are a lot of resources out there. The other thing that I think that's really been introduced recently on the VA side that's been a huge help is also some peer support, and knowing that

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other folks are dealing with some of those same symptoms and how in real life they've dealt with them. And I know that's been integrated in mental health, but they're also a resource for folks that have both a mental health diagnosis and a TBI and are balancing those things.

So I think that there are a lot of resources and support avenues out there for cognitive symptoms. It's just making sure that the providers in your area or you are aware of where those things are and how you can access them and get them to your patients. I know that sometimes the biggest obstacle is, I know what they are, but how do I get them to my patients? And so where those resources are is definitely something that potentially DVBIC or VA can help with.

I was just going to say on the DVBIC website – and I know there are similar things on the services websites and the VA sites – but we have symptom management fact sheets that we have produced for our patients, our service members, families, veterans, on cognitive disorders, memory disorders, how to teach better teach sleep hygiene. So those are all readily available on the DVBIC website under the Education tab.

So if nobody else has anything to add, we will move on to our next submitted question: "Because of cognitive deficits, the patient is sometimes unable to rate pain using methods such as visual analog scale (VAS). What are suggested methods to track or rate pain levels in patients like this?"

And I am tossing this one to Lieutenant Commander Shields.

I guess the first thing I would think of when I read this is it's obviously not a patient with a mild TBI because somebody with a concussion should still be able to use a visual analog scale. So if you have a patient that is having trouble doing that, then the first thing is you're not looking at a mild TBI patient. But if you are looking at somebody who has more moderate or severe TBI, there is a whole host of things -- working with your other medical providers, working with your occupational therapist/ physical therapist. It could be simple things – eye tracking, facial grimace – any of the non-communicative signs that you could be looking for.

But at the very basic level, if you can get a reliable "Yes" or "No" – Does this hurt? Yes. Does this hurt? No. Then at least it gives you somewhere to go from there.

I think that's great. So let's go to the next question: "How would you handle the complex patient who comes to you post-deployment with a history of concussions that will be moving to a new unit in one to two months? He may not be able to come to multiple medical visits."

And that is a challenge.

I'll start.

Dr. Maxfield-Panker will explain this to you in great detail.

I think one thing is this is going to highlight the importance of case management in a lot of traumatic brain injury patients. Case management is such an invaluable resource and member of the team for a lot of these folks. So I think the first thing is to start addressing things, to use the time that's available to get the symptoms and the patient's concerns noted and to have a treatment plan that starts to address those.

And then also work with other people, other resources – whether it be other resources within the building, certainly case management – but also, if you're at a smaller site, out in the community. And then there's that warm handoff to the next place where that person is going. Depending on the situation, the PCS may be able to be delayed; or there can certainly be calls made and someone on the other end to reach back to once they get to their new station.

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But I think the key is really case management and having those resources – be they within the building, outside in the community and the network, and then also at the next location where that patient is going to be -- really making the connections and connecting those dots.

And if it's a place where you don't have a lot of those care management resources. DECO does have a program called In Transition, where we do help with some care management handoffs. So you can contact the In Transition Program. They're on our website. You can reach them through our Outreach Center. And they really are there to help you find that next provider and make sure that the person gets walked through the process so there aren't any lost opportunities.

Another potential resource is if you are located within the military health system and you are able to get with a DVBIC Regional Care Coordinator. Because they know their network areas and they can reach to the other Regional Care Coordinators, one, they may be able to give you some community-based assets as Dr. Maxfield-Panker alluded to. Or they may be able to connect them directly with the next TBI service.

And so I think there are a lot of things that we can utilize that are resources to us with respect to care management that we don't think of off the top of our heads. So the In Transition Program is one; the Regional Care Coordinator is the other. But even just a simple phone call and making sure that that receiving provider is aware is another way. The more that's reinforced, the more somebody knows that person is coming in and they're going to need some more services. But totally agree that addressing what you can when they come in, there's no reason for delay. The earlier they get the treatment, the better.

So I think we'll move to the next question, and the next question is: "Post concussive tinnitus seems to get worse with fatigue. Are there any treatment recommendations for managing tinnitus?"

Lieutenant Commander Shields?

I will tell you quite blatantly, my first thing to say is refer them to an audiologist, which is what I did. I referred to an audiologist when I saw this question because obviously that's where this patient needs to go. So when talking to an audiologist, they said one of the things they look at is doing some kind of sound therapy where they can fit service members or patients or veterans with hearing aids that might be able to filter out noise and make that a little more manageable -- educating a person on the different kinds of noise that they can listen to that might be more soothing, like the sound of rain or a waterfall, and how to maybe filter out background noise.

One of the other things that the audiologist conferred with me is that they a lot of times have to end up doing a lot of counseling on just the emotions of having that sound in your head all the time and the emotions that that can bring with it. But my short answer would be refer to an audiologist.

Which is perfectly acceptable.

So I'll ask the panel: Have you noticed any link with disturbance and concussion?

Well, I guess it depends. A lot of people, especially in the military environment, perhaps are in situations where they're not getting good sleep. So they kind of go hand-in-hand in a way in that a lot of people aren't getting good sleep and then they sustain a concussion. And what do they really need to do? They really need to rest, and so that sleep is such an important component.

What we find is that insomnia in certain patient groups within the military is fairly common -- also sleep apnea. So these types of sleep disorders the question should be asked and they certainly should be investigated if someone is not getting good sleep. But certainly I think the first question that should be asked is about sleep hygiene and are folks allowing themselves enough time to sleep if they're in an operational environment that is supportive of sleep and adequate sleep, and are they doing other things that may inhibit their sleep such as energy drinks after a certain time in the evening or other things that may be impinging upon their ability to get to sleep.

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So there's such an important link between rest and sleep and then successful recovery of concussion that that definitely needs to be addressed at the first possible opportunity.

I think you said that very succinctly and wrapped everything up. The only thing that I would really add is that our concussion care centers in-theater would keep a log of sleep, headache and other activities -- scores on neurocognitive assessments. But as I moved around Afghanistan looking at those logs, sleep especially is correlated with headaches; and the headaches seem to go away as sleep returned to normal.

So you may not want to make them go cold turkey with their cigarettes or their energy drinks, but certainly supervise them and keep that to a minimum. You don't want to precipitate some symptoms that may come from nicotine or caffeine withdrawal; but by the same token, as you're doing that very supervised rest and return to duty, monitor that and help them with the sleep hygiene. And hopefully they'll take those skills with them and utilize them for a full recovery.

We'll move to the next question, and it's another symptomatic question: "Could you please provide headache treatment and prevention recommendations for the small traumatic brain injury concussion."

And you just alluded to some of the sleep and headache relationships. Is there anything that you could recommend for headache treatment and prevention?

Certainly, the clinical practice guidelines for in-theater spell out what you should use in the acute setting and what you can then move to. So Tylenol – try not to use any of the NSAIDS early on. Can't emphasize enough getting a good history and asking them whether or not they already had some type of headache syndrome in their past because the concussion itself may precipitate headaches or worsen them, exacerbate them, make them more frequent. Especially for migraine'ers, if you are very sensitive to short-acting analgesics, you can take someone who was just having a headache and then spin them into an analgesic rebound or chronic analgesic use headache. So you really do need to take a good history. Nothing substitutes for a good history and physical.

Switching as you go into the subacute phase to a long-acting NSAID like Naprosyn can be helpful – again, doesn't eliminate the possibility of chronic analgesic rebound headaches, but certainly will reduce it. Long term, if you're looking at someone who is continuing to have headaches, the recommendation is to use one of the tricyclic antidepressants like nortriptyline or amitriptyline at low doses – starting very low. One of the reasons, it has good results for managing pain as well as helping to sleep.

And there are guidelines available. Some of the guidelines are on the DVBIC website – the guideline that you mentioned. And then there's also a VA/DOD guideline for mild traumatic brain injury or concussion that has specific sections on headaches and what the level of evidence is for someone of various headache medications and some of the potential protocols for those.

I think there are a lot of resources out there – again, it's just making sure you know where to get them. They're available on the DVBIC website as well as in the Veterans' Health Library or on the Public Health website for VA. If you just Google [www.vadodtbiguideline.com](http://www.vadodtbiguideline.com), it pops straight up on about 20 websites. So if you put a quarter in the Google machine, hose will pop right up.

So anything to add from either of you on headaches?

I think not only for headaches, but most of the things we're discussing have been vetted through the services – through the Veterans Affairs and specialists around the country – to ensure that we're giving the best care to our service members, veterans and their family members.

Absolutely, no question.

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"What are the unique characteristics of blast injury compared to non-blast concussion?"

I can start this one, and then I'm going to ask for some help from my friends. I think because generally when you look at a patient, the etiology is important; but I'd probably tend to take more of a symptom-based approach, paying attention more to what I'm seeing being manifested in symptoms. But from a general perspective, I've seen that the blast is more diffuse; so it may not be as localized. It's more of a diffused injury.

And I think the biggest issue here is that across the studies that have really looked at blast versus non-blast – and to start with, I think that the biggest issue there is sometimes it's difficult to tell if it's "pure" blast. Pure blast is a difficult thing because when somebody is in an explosion, not only do you get that primary blast wave but then you also have those kinetic forces that either throw you into a building, into the ground. There's potentially shrapnel. There's potentially heat injury. And so there are all phases of that blast injury.

And at last count, I think we were at quintinary. So there's primary, secondary, tertiary, quaternary and quintinary. And that's still just physics. But what we haven't seen in any of the scientific literature to date – and the panel can absolutely correct me if I'm incorrect – is a real distinction in the symptom presentation, in the duration of the symptoms, in the types of outcomes between those that are called blast injury – though that may not be just primary blast, just from the blast wave. It may be really a blunt injury that's not unlike many other brain injuries.

And so those distinctions have not been fully defined in neuroimaging. They haven't been defined cognitively on personality testing. Even from DVBIC's own 15-year study, there was a study that looked at more blast versus non-blast, and there were no differences in personality testing or neurocognitive performance. So I think that the difficulty is that we really haven't seen that there's a "distinctness" to blasts; but that those folks really do have symptoms that are more consistent with what we see in a traumatic brain injury presentation.

The only thing I would add to that is that fortunately, we have event-driven protocols or potentially concussive events that mandate screening include blast and non-blast. And then to progress the patient through treatment, it's really symptom-based. So it's not a matter of time, and it's not a matter of how they received their injury, but what symptoms are they experiencing now.

And the success for the Concussion Care Centers includes blasts as well as head injury. And if you want to look at phenotype, they respond to that therapy being evaluated early on and getting the treatment that they need.

Absolutely, so I think we're going to move to the next question, which is: "What other post-concussive symptoms do you see long term, such as behavioral or cognitive functioning deficits?"

I think it's important to realize, as Colonel Hinds said earlier, the vast majority of these patients with concussions recover fully and quickly. So 90% of people will not go into long-term sequelae. If there are those symptoms, you're looking at more of the attention deficit difficulty with memory, difficulty with higher level thinking skills – what we call executive functioning skills. Behaviorally what I've seen is maybe a decreased motivation and just kind of almost a depression from knowing what you've lost; but the vast majority of people with concussion will recover quickly and fully.

And I would add to that and say that there are some folks that – most folks do get better. For those that don't, it's not usually also only the brain injury that we're dealing with. Just as you noted, that's also the time where I think the clinician really needs to key in on what else might be going on. Once we just say it's the brain injury, it's the brain injury, it's the brain injury, we blind ourselves to any other potential condition. And as we noted and VA data really validates, many people are coming in with pain disorders that can interfere with sleep, that can then make their cognitive difficulties worse. There are a lot of folks that have a diagnosis of psychological health disorder – whether that's PTSD, whether that's depression, whether

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that's another anxiety disorder -- and so really looking at the full person and not just that specific diagnosis.

Again, I know we had that question of, "Do people put the PTSD label on too quickly?" But I think there is also the other side of that, which is that if you don't look at the full patient – if you don't look at that service member or veteran as a full person and really consider all the things that may be going on – like they may have back pain or knee pain or shoulder pain. Those are not easy things to sleep with, and that can make other things worse. And so without considering the full person, I think you miss a lot of opportunities in people that are presenting long term to make some improvements.

So we are going to go the next question, which is: "Do you use cranial electric stimulation to help with post-concussive insomnia and other sleep issues?"

I'm going to toss this one down to Dr. Stephanie Maxfield-Panker

Cranial electric stimulation or non-invasive brain stimulation, in my opinion, can be useful for a lot of things. But it's really generally still in the research realm. There are multiple types of non-invasive brain stimulation – be it transcranial magnetic stimulation, repetitive TMS, direct current stimulation, alternating current stimulation, cranial electric stimulation, etc. I am not aware of any widespread clinical use for post-concussive insomnia or post concussive symptomatology. But that doesn't mean that there aren't some case studies and there aren't some research studies going on looking at those modalities. I am not aware of any widespread studies or widespread use of that.

So I think we'll move to our next question then: "How do medical providers access the information in the Combined Information Data Network Exchange (CIDNE)/Blast Exposure Concussion Incident Report (BECIR)?" And that is a mouthful.

I'll toss that to you, sir.

When I saw this question, I've had anecdotal experience with trying to get access to this. Usually one has to go through their S-2 or their Intel/security folks to get access. I reached out to a number of folks at the Joint Trauma Analysis and Prevention of Injury in Combat, JTAPIC. That's a mouthful; don't ask me to repeat that again.

You can say that again too, and then you'll have done your job for the day.

That's right.

CIDNE, the Combined Information Data Network Exchange, is really for the leadership. You have to, as a medical provider, really have an operational need to get access to that. Having said that, when you look at the administrative reporting system, which is the CIDNE as well as the Blast Exposure Concussion Incident Report, or BECIR, leadership-driven, admin-driven event entry of patients who might have been in a concussive event or possible concussive event, there is a bridge that a provider who's being deployed could get access to which allows them to see who was reported in the BECIR and take a look at the electronic health record to marry them up to see who has been evaluated.

So a couple things to note – event driven, just because you get entered into the BECIR/CIDNE report doesn't mean that you have a concussion. It just means that you have been exposed to a potential concussive event. Then there should be a note, at least a screening for concussion in the electronic health record, and then treatment for those who are diagnosed with concussions.

There is a TBI Tracker System that's through MODS, so medical providers would have access to the MODS system. But there are a couple levels before that BECIR data gets actually inputted into the MODS, and it's certainly not a perfect process. So there is some availability of that information once it gets through the BECIR/CIDNE and into MODS. But it's certainly something that at least Army leadership

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is looking at very closely – it's how do we improve that process for tracking in particular? And JTAPIC, its joint group, is really looking at that as well. Going forward for the next conflict, etc., what systems can we put in place that are perhaps improved over the ones we have now?

So I've really appreciated all the responses that we've had because many of these questions were taken from missed opportunities that we've had from our synapse and just as a follow up. The nice thing is with this interactive platform, we can get some other questions that I think would be useful for us to respond to from the audience that we've gotten from our audience portal. So what I'm going to do is take one of those questions while we're flying through the slides, and toss this out to the panel probably with me as the lead for the first one.

So the first one is: Given the comorbidity between TBI and drug and alcohol disorders, is the VA engaged in research with regard to identifying effective treatment interventions, and have any integrative programs addressing those conditions been developed?

I will tell you that from the VA perspective, there is a great deal of research on TBI and treatment protocols for comorbidity in the VA. The VA's research portfolio on TBI is not as large as some of the other portfolios that the VA has in research, but really comorbidities is one of the foci of that portfolio. And so I do know that there are a couple protocols that are looking at the specific interaction between traumatic brain injury and drug and alcohol disorders – most specifically alcohol, I believe. And those studies actually can be looked up through the NIH report. If you go into VA and type in VA and TBI and alcohol, you'll be able to see those protocols. And they really are focused on treatment interventions.

Another great resource is the National Institute for Disability and Rehabilitation Research has a Knowledge Translation Center. And one of the things that you can link to through that is a protocol that was developed at Ohio State that was specifically developed for the treatment of traumatic brain injury and alcohol use. And that's been refined ever since it was first developed back in 1999 and 2000. And so it's a great resource for folks who are working with dual-diagnosed individuals with these conditions. And they have a manual for the patient, manual for the provider, and a lot of different family educations. So I think that that's definitely a resource.

What I think we will do just as a brief pause to make sure that we do not forget it or get it overwhelmed is that I want to give Lieutenant Commander Shields a brief opportunity before -- because we have a question that will get to some of the initiatives that we have ongoing and this will potentially link to it -- I'd like her to just give you an overview about a new product that may be a resource for folks as they're working with veterans and service members.

Thank you. I wanted to introduce the Back to School Guide to Academic Success after Traumatic Brain Injury. I referred to it earlier in the presentation. This is a resource, and it's available for download at [www.dvbic.org](http://www.dvbic.org). It also will be available in print format soon. This guide is for service members and veterans who have sustained a TBI and are going back to school, whether it is a college situation, university or vocational school.

The guide is set up to help them navigate campus life, manage ongoing symptoms, learn strategies for success, and to help ease that transition back into a civilian setting. The purpose of this guide is multifaceted. It can be used for the patients, but also providers can use this guide as a teaching tool to help their patients build a list of helpful contacts, track their progress, and create a detailed schedule to manage their time. The guide includes a Frequently Asked Questions section, which also will give you quick answers to common questions about accommodation plans, financial aid, and assistive technology – the apps that we've been talking about.

Throughout the guide, the students can learn strategies to overcoming some cognitive strategies with intention and concentration; can learn about organization and planning; memory; thought processing; and some guides on self-awareness. A comprehensive student resource section empowers the students by

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providing websites/links that can help them find answers to their questions and connect them to people that can help and help them develop a support system.

The guide was developed in collaboration with DVBIC and DHCC, which is the Deployment Health Clinical Center, created through a panel of experts. It also included experts from the Department of Veterans Affairs, the University of Minnesota, the Virginia Commonwealth University. It included not only occupational therapists and speech language pathologists but counselors, rehabilitation psychology, psychology and social work. We hope this will be a resource which the service members and veterans can take advantage of the military's education benefits and empower them to be successful and improve their quality of life.

It's a really exciting guide, and I hope that folks can download it and get it to the service members and veterans who are really moving on into a new phase of their life potentially or gaining new skills and making sure that they can cope with that given some of the challenges that they may have from the injury.

Just a question – it is meant for the adult population or possibly late adolescents?

Yes, yes.

So that's a good clarifying point though.

Thank you.

So I think what we'll do is we'll take a couple more of the audience questions, and then we'll move to the conclusion of the webinar.

I think that we addressed this a little bit; but, Colonel Hinds, I'll give you another opportunity to make sure that the folks really get the message on this: "What is the DOD doing to ensure service members are not being rushed back to service after a TBI? What are the symptoms in place, other than a profile or restriction of duty?"

I appreciate this question for the important reason that we need to raise that awareness that we do have a system in place, and a system that's been working. So it's not just writing a profile and letting someone go home. It's not seeing a patient in the emergency department and just saying, "You've had a concussion. Family members, just watch them."

We have tons of education for leadership, for medical providers, for caregivers, for the patient. So that they understand what a concussion is, we have this analogy to an ankle sprain. But understand that you need rest; it's not just sleep. And what we need to take a look at is the symptoms -- it's not just a time limit – symptoms-based approach for return back to whatever activity you're doing. So if it's a service member who's going to work or a service member who is taking advantage of education, all of that is very prescribed.

Early evaluation -- if they're still having symptoms, coming back, getting further evaluation and further testing and access to specialists who might be able to help them with their particular problems from that type of headache they sustained.

So just to add on to that, I think the DOD recognizes that we need more definitive tools to help us make those decisions. Right now, a lot of the return to duty is based on clinical judgment and working with that patient; and not to downplay that, but the DOD is developing and has developed some tools to assist in informing that clinical judgment. Until we have the biomarker that tells clinicians that, yes, absolutely there's no grey area; you're ready to go back and you're not ready to go back.

We're developing a return-to-duty task and protocol that will help inform that decision, and as well the progressive return to activity guidance that is going to be published here before the end of the year will

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help inform clinicians that patients have been able to progress through various stages of activity, and they've been able to undergo exertional testing without significant symptomatology; so that will help bolster the clinical judgment that informs that return-to-duty decision.

Great, and actually I think that leads well into the third audience question which is: "Are there any strategic initiatives related to TBI care, research or education ongoing at this time?"

I can start that one. I think people will be reassured to know that we don't just talk when we're on these webinars – that the Department of Veterans Affairs, the Department of Defense, the National Institutes for Disability and Rehabilitation Research, the NIH, even other departments in the HHS, like SAMHSA or HRSA, we do regularly talk about what it is that we can do to make sure that strategically we are coverage the landscape for TBI care, research and education.

You know, in research there is actually a National Research Action Plan that was published this year in response to an Executive Order by the President to make sure that we were crosswalking all the activities that we have in TBI and mental health for research. And there are multiple meetings where we are looking to see where we can advance the field together as federal agencies. And I think that's a major initiative that's going to be getting a lot of attention in the coming years.

The other thing in respect to TBI care, Colonel Hinds work together regularly with – we're going to be working with some service representatives and some clinicians from the VA and leadership in the VA to see how do we better enhance TBI care across our departments. How do we take the lessons learned from what the DOD has been doing in-theater? How do we take the lessons learned from what VA's been doing for rural and remote locations? How do we take some of our polytrauma system of care lessons or some of the initial trauma treatment recommendations? And then how do we inform each other?

And then for education, we as Lieutenant Commander Shields noted, for clinical guidance, for clinical recommendations for any of their products, we're constantly in communication to make sure that our education efforts are informed by all the lessons learned from all the departments.

So we do have some major strategic initiatives that we're going to be looking towards to make sure that people have good access to care, that people are aware that most of the traumatic brain injuries are not occurring in-theater. So you, as a clinician, need to be paying attention to the falls, the motor vehicle accidents, mixed martial arts, the other things that people do to put themselves at risk here at home or in garrison when they're not deployed or as veterans who are out living their lives.

So I think those are great initiatives that we're looking to do together. And I think that we'll advance the field for Traumatic Brain Injury as a whole.

Sir, do you have anything else that you wanted to add to that?

No, I agree. I think the common theme I'm talking among the services, talking with the Department of Veterans Affairs, talking with some of our non-governmental organizations, what about now? What about the dependence – the family members? How are we going to sustain this emphasis on concussion care so we don't have to recreate this for a future conflict? And I think to that end, everyone is committed to address those issues and come up with practice guidelines, to continue to do research, to help our service members, veterans and their family members. The Army has taken a step to ensure a continuity and standardization of care, taking what we've done in the deployed setting and creating an in-garrison policy with guidelines on the evaluation but also exertional testing and how to return somebody back to duty.

And I'll just add to that, from the Army's perspective, our desire (inaudible) and perhaps for most of us here is that we effect a cultural change within the military to reduce stigma for Traumatic Brain Injury and other invisible wounds, so to speak, so that people can get checked out that much earlier so that they

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can, again, ensure they have the best chance for a full recovery because they're getting treated that much earlier.

So the cornerstone of that cultural change is really education. And so the Army constantly works with DCOE, DSPC, as well as the other services to try to better our education, better our educational efforts – be it education for providers, education for family members.

And then the Army of course, as Colonel Hinds mentioned, has a new policy. We have two policies that really mandate education: 242-11 and 16513. So our educational products that are coming out for those policies we hope will be very engaging and really get the interest of everyone who watches them – whether they're a soldier, leader, medic, health care provider, or primary care provider. So that's a major initiative.

And then of course research – we have a paucity of effective treatments for mild traumatic brain injury. We have education, we have rest, and we have expectation of recovery. And there is research ongoing in other treatment modalities, as was mentioned previously. But our research efforts are robust to look for other treatment options, for mild as well as other severities of TBI.

Okay, so I think that the panel has given you a sense that this is a major cause for all of us. It's not going away anytime soon. And really all of us want to effect that cultural change, not only in the military and in the Department of Veterans Affairs, but in the culture at large. And so I think that's been our major push, is to just improve that care and our education to make sure that folks are aware of this.

So the last question – and I will just pose this one because I know that this is a major issue for some folks as they're looking at the revisions in some of our diagnostic systems. And most recently, the Diagnostic and Statistical Manual of Mental Disorders, Version 4, text revised, and DSM-5, there's been a transition. And so there was a question about what are the major changes there for the diagnosis of concussion and post-concussion.

And so I will turn that over to you, Lieutenant Commander Shields.

The major difference that I found was that concussion and post-concussion syndrome in the DSM-4 was listed within the Appendix; whereas now, in the DSM-5, there's a section that's entitled Neurocognitive Disorders. And this encompasses the diagnoses of mild NCD or neurocognitive disorders and major neurocognitive disorders. So this suggests that it's becoming more of a diagnostic residence than an off-to-the-side Appendix.

It was really one of the sort of research diagnosis previously. And what happened in the revision is instead of having the dementia versus mild cognitive impairment, they really changed that section to reflect mild impairment versus major impairment. And so as you look through the DSM-5, you'll see that there are a number of ways that people can meet that diagnosis, given the wide range of disorders that affect cognition.

And so I would say it's no longer really a research diagnosis; it is suggestive of a diagnosis, and that was recognized by the DSM-5 Committee. So I think that that's the major change there.

So I think that that's going to conclude our question session for today. I really do want to thank the panel for their participation and all of the work that they've put into preparing for today, and also to let you know that we definitely want your feedback on this webinar. So we invite you to take the interactive customer evaluation found on the Online Education of the DVBIC website.

And your feedback really does inform future webinars, and so we value that feedback. The other way you can do it is to click on that link and send comments to that extremely long e-mail address that will let us know what you think and feel about this particular webinar. But you only have to click it; you don't have to type it. So that's very convenient for you.

**DVBIC Monthly Webinar Series: Hot Topics in Traumatic Brain Injury  
TBI Global Synapse Town Hall: Your TBI Information Connection  
Nov. 20, 2013 – 2:30 p.m. to 4 p.m. EST**

So we do very much appreciate all of the questions that were submitted in advance, and we hope that we've answered many of them to folks' satisfaction. And we also appreciate your giving us these questions to respond to.

Our next webinar is going to be on December 18<sup>th</sup>, and so save the date for that. It will be The Role of Integrative Medicine in the Treatment of Traumatic Brain Injury. And I know that we will have a fantastic panel that will be addressing that topic for us, and we look forward to hosting that.

This will conclude today's conference. All parties may connect at this time.