Session Date: 1/19/2016  
Series: Traumatic Brain Injury  
Session title: VA’s TBI Screening and Evaluation Program  
Presenter: Joel Scholten, Doug Bidelspach

*This is an unedited transcript of this session. As such, it may contain omissions or errors due to sound quality or misinterpretation. For clarification or verification of any points in the transcript, please refer to the audio version posted at www.hsrd.research.va.gov/cyberseminars/catalog-archive.cfm.*

Molly: Without further ado, I want to get things started. I am going to turn it over to Dr. Ralph Dipoma [PH], who will introduce our speakers today. Ralph?

Ralph Dipoma [PH]: Yeah, thank you. Molly, we are calling from snowed in Washington each in our own home. Dr. Joel Scholten is kind enough and Doug Bidelspach to do this. Joel is the National Director of Physical Medicine and Rehabilitation to a Veteran’s Administration, as well as Associate Chief of Staff for Rehab Services at the DC Veterans Medical Center. Master of Physical Therapist, Doug Bidelspach, is the rehabilitation planning, specialist responsible for tracking and screening, and diagnostic services for traumatic brain injury in the agency. With that I will turn it over to Molly.

Molly: Thank you. I believe that we will start off with Doug Bidelspach. I will turn it over to you.

Doug Bidelspach: Hi, thanks Molly and good morning – good afternoon, I guess depending where you are today. We are excited to be here today to present on the topic of the TBI screening and evaluation program. We will give you an overview of the history of the program and also get into some of the data and some of the research that has been completed to date. Hopefully there will be some discussion of future topics that may be malleable as we move forward. We are going to start with a polling question I believe on the second slide. Molly, would you like to take that over?

Molly: Absolutely, thank you. For our audience members, you should see on your screen now a poll question. We want to get an idea of how familiar you are with the diagnosis and treatment of TBI. Your answer options are not at all, a little, moderately, or very familiar. You can just click the circle right there on your screen next to your response. These are anonymous responses. We have a very engaged audience. This is great. We have had almost a 90% response rate, so we really appreciate that. It helps to give our presenters an idea of how in depth to go. I am going to go ahead and close the poll and share those results. We have 2% responding not at all. About a quarter of our audience is a little familiar. Then 37% each are for moderately or very familiar. Thank you to those respondents, and we are back on your slide. Are you up in the full screen mode?

UM: Yes I am. Can you see okay?

Molly: Yeah. I am just seeing your task bar down at the bottom. I did not know if there was a way to hide that.

UM: Oh yes. I am not sure.

Molly: That is okay. It is no problem. We are good to go.

UM: All right. Let me advance the slide then.

Molly: You should just be able to use your arrow keys or your return. There you go.

UM: Okay.

Doug Bidelspach: Okay, great thank you. We should be on slide three. It is a quick overview of the organization of today’s presentation. As I mentioned, we will touch on the background of the TBI screening evaluation process, talk about some of the implementation and enhancement activities related to the programming. It is not only the clinical programming, but also from an IT perspective. As I mentioned, there is also the research findings to date. We will also touch on some of the treatment programs and coordination of efforts really in terms of developing the treatment plan, following a diagnosis of TBI, or other polytraumatic related injuries. In specific detail we will look at the individualized rehabilitation and community reintegration care plan as well as the Mayo-Portland Participation Index. They are two documents and templates that we really use to help guide the process. Also we will close out with our opportunities for future investigations. Can you advance to the next slide please?

One of the questions that always has faced VA and any other clinician when you look at TBI and other conditions as well is whether we should screen or we should not screen. Specific to TBI, when we go back to the initial years during the conflict, the initial focus was looking at returning service members that had moderate or severe TBI or polytrauma. These were obvious injuries. They would require inpatient rehabilitation. Really it was the driving force of the polytrauma system of care, starting with the polytrauma rehabilitation centers. As we got through the development of the inpatient treatment and began to see a little bit more of the types of cases that were returning from combat, we found that there was an increasing number of service members and veterans with multiple symptoms following deployment. It was not just those that were moderate or severe traumatic brain injuries. We also had these milder cases that came back with other comorbid conditions and really unique presentations.

As we began pulling feedback from the field and talking with clinicians, we realized that evaluation of treatment was inconsistent. When you think about the size of the system there were some variations across the different sites. We tried to develop a program that was going to streamline and have some consistency. There also was a lot of pressure both from congress, from the media, and the general public really to develop a system to help address the issues that were facing this cohort of patients. The VA collaborated with DoD and DVBIC in developing a TBI screening tool. That was deployed to VA clinicians in April of 2007. From that point forward, and as we will go into in a little bit more detail in the subsequent slides, there is a lot of different clinical processes that were developed. A lot of debate that is really still ongoing is what is the underlying cause of some of the symptoms? Is it TBI specific? Is it PTSD or behavioral health specific? Is there a combination of both? Or are there other driving factors? Those are some key elements to consider. But I think ultimately the one key factor to keep in mind is we are really addressing the symptoms regardless of the underlying cause. That is something that I think is very important for everyone to keep in mind. Let us move onto the next slide please. It should be slide number five.

When the TBI screen was released it was accompanied by a policy – a VHA directive. What I am showing in this slide is actually the second iteration of the directive, but they are very similar. Actually we are in the process of updating and releasing the next version, which hopefully will be out in a couple months. The VHA directive on screening and evaluation of possible TBI and OEF/OIF/OND veterans, this outlined the policy and requirements for screening OEF/OIF/OND deployment related injuries. Any individual that receives a positive screen on the TBI clinical reminder must be offered referral for the comprehensive TBI evaluation. With this CTBIE, the TBI evaluation is also known as the CTBIE. There is a national template, and this national template should only be completed for those who have a positive screen for deployment related injuries. The language is very much deployment specific. So if you completed for a stateside injury, motorcycle accident, or things of that nature; it is really not consistent with the way that the template is written.

The directive highlights that the comprehensive TBI evaluation needs to be completed at a Polytrauma Network Site or a Polytrauma Support Clinic Team site, and be completed by a TBI specialist. Given the breadth of the overall VA system of care, sites that are not classified as a PNS or PSCT can use other providers. But this alternate plan of care must be requested through the VISN CMO. Then it comes to our office where Dr. Scholten and others in our office will have a meeting to discuss the specifics of the plan and develop a coordinated effort to ensure that the training and experience is adequate to provide the TBI evaluation. Then more significantly, it is then to develop the treatment plan when indicated. Move onto the next slide.

It is the TBI clinical reminder. This slide is just a brief overview. Again, it is a four section screen. The first section touches on exposure to traumatic events. The second section provides the opportunity for the patient to affirm if they had immediate disturbance of consciousness after those traumatic events. The third section discusses new or worsening symptoms after the events. Then the last section talks about current symptoms. In the recent time since you returned, are you still having any of these symptoms that may be related to TBI? An initial positive screen is tracked for completion of the comprehensive TBI evaluation. A positive screen is identified by the presence of an affirmative answer to the fourth section, which is essentially a health factor in Vista. It is TBI section four yes. If that is present and there is a presence of a TBI referral sent – again, another health factor in Vista. If there is not a TBI referral declined health factor, those are the different elements that are viewed and analyzed to come up with a cohort of patients that are tracked for completion of the comprehensive TBI evaluation. Move onto the next slide.

The comprehensive TBI evaluation has specific components. The first thing we look at is the history of patient’s illness or symptoms. There is a review of body systems, a targeted physical exam, and the administration of the NSI – the Neurobehavioral Symptom Inventory. Then also we confirm the diagnosis of deployment related TBI. There are also questions immediately after the diagnostic question that touches on from a clinical perspective. Based on what you feel, are the current symptoms related to TBI, related to behavioral health, or related to some other condition? If the patient has symptoms that need to be addressed, another key point is the development of the Interdisciplinary Treatment Plan. Then after the treatment plan is implemented and the patient has either going through a course of treatment, possibly some home therapy, and possibly therapy in the community; then follow up is also a key component as well.

A key aspect of the comprehensive TBI evaluation is that it can be completed face-to-face or through telehealth evaluation. The first bullet has a link to the TBI teleconsultation protocol. This is a pilot that was completed about a year and a half or two years ago. It was a collaborative effort with multiple VA sites, some other clinical experts, and from also a contract with the University of Pittsburgh to help in pulling together much of the training material that is provided at that link. This helps to lay out some of the requirements for a TBI teleconsultation visit. Really we just tried to pull back the curtain a little bit. There is not a great mystery or not a secret approach to telehealth for this evaluation, but hopefully this helps to just give individual clinicians an orientation and become more familiar with the process.

Another piece on this slide is within the attachments for the Go-To Meeting. There is a document that outlines the requirements. If you are using community providers to complete the comprehensive TBI evaluation, there is a document that outlines some frequently asked questions and specifics that you would want to include in your documentation. It is very much consistent with what is outlined for VA providers. This just touches on how you want to communicate that with the community providers providing some educational links, some specific templates, and then how you would document completion once the patient and once the evaluation information returns to the VA.

Move onto the next slide – slide number eight. Molly, I think this is another poll question.

Molly: Indeed, thank you. For our audience members, again on your screen you will see the poll question up there. In December 2015, VA completed the one millionth screen for possible deployment related TBI. Do you think this statement is true or false? Again, these are anonymous responses so feel free to take an educated guess at it. All right, the answers are streaming in. We have already had two-thirds of our audience vote. They are still coming in. Okay, it looks like we have capped off at about 80%. There is a pretty clear trend, so I am going to close that out and share those results. We have 77% responding true, and 23% responding false. We are back on you.

Doug Bidelspach: Okay, thanks Molly. We are onto the next slide – slide nine. Yes, actually VA did complete the millionth screen in December. We have screened over one million veterans for possible mild TBI. Approximately 20% of those individuals screen positive and are referred for the comprehensive evaluation. Our most recent completion numbers are provided in the next bullet. From April 2007 through September 30 of 2015, nearly 138,000 have a completed comprehensive evaluation. 82,000 have received confirmed diagnosis of TBI. Overall, approximately 8.4% of the total veteran population screened receives a TBI diagnosis through the TBI screening and evaluation process. Move onto the next slide.

We will touch briefly on the polytrauma and TBI system of care. From the initial feedback it seems that there are quite a few experienced clinicians, so we will not spend too much time here. The Polytrauma System of Care consists of 110 specialized rehabilitation sites. The Polytrauma Rehab Centers provide the most intensive inpatient rehabilitation services. They also have outpatient care obviously and telehealth offerings as well. Polytrauma Network Sites are more focused on outpatient TBI and telehealth. There is an inpatient rehab unit as well, but it is not as specialized and not as active in terms of treating the returning service men and women with a polytrauma or TBI related condition. Then the Polytrauma Support Clinic Team Sites are outpatient TBI care. There may be an inpatient unit at these sites, but that is generally not the case.

In terms of the overall system of care, some of the unique programs that have developed from the system of care include – as we are discussing the TBI screening and evaluation program – polytrauma transitional rehab, which is the program found at the five Polytrauma Rehab Centers. It provides that linkage from acute inpatient rehab to discharge to the community for those individuals that may need a little bit extra time, a little bit more focused on location and community reintegration. That is the real emphasis of the Transitional Rehab Program.

Emerging consciousness again is done at the five Polytrauma Rehab Centers. Polytrauma case management has really expanded and been more formalized through the Polytrauma System of Care. Assisted technology labs provide additional expertise and coordinated efforts as it relates to different technology. It could be communication devices. It could be customized wheelchairs. It could be in some instances advanced prosthetic interventions as well. Then many of you are familiar with the assisted living TBI pilot, which is a contracted service into the community. They are very successful over the past five years or so. Move onto the next slide please.

Slide number 11 just shows a visual map of the Polytrauma System of Care. You can see the distribution of the different levels of care that are provided across the country. Move onto the next slide please.

Number 12 we look at the integration of comprehensive rehabilitation care. Always the patient and family are at the center of the services that are provided. But this schematic just tries to give you a little sense of the complexity of the cases that we are seeing, and specifically for polytrauma and TBI. There are many different conditions that may be involved. There are many different dynamics in terms of the patient and family that really need to be considered. Something that is a little bit unique for VA in terms of rehab is the involvement of the military. Many of these individuals that come to the VA and specifically the Polytrauma Rehab Centers still are active duty. The care management and military liaisons are very essential to the process because some of the services are provided on the VA side. Sometimes they will go back to a DoD facility or military treatment facility for services. Coordinating the effort of the entire team – the entire team in this case may involve DoD providers – is really essential for a positive outcome. Move onto the next slide please.

Slide 13 is in terms of the implantation and enhancements. The clinical program we have kind of gone through already with the system of care development, enhancement, and activity at the Polytrauma Rehab Centers, moving that out to the Polytrauma Network Sites and support clinic teams for additional outpatient clinical interventions, and ongoing education, training, and oversight of the entire system of care. That comes not only from our office, but also the experts at the Polytrauma Rehab Centers, Polytrauma Network Sites, and even the support clinic team sites. They always share their knowledge, whether it is a national training call that we may sponsor but also the regional training calls that occur at the network site and also from the Polytrauma Rehab Centers themselves.

We have also developed a key partnership, not only with primary care but also with mental health and other providers. This is essential because you have a handoff of care at a certain point in time where the long-term management of these individuals may be best served through their primary care provider with continuing communication and consultation with the subject matter experts in a specialty area. That handoff from screening to evaluation, and then actually from evaluation and treatment back to the primary care provider is essential for managing these cases long-term. Really it is the primary care model for post deployment care that helps to highlight that and more formalize the connections as well. As I mentioned, there is also collaboration with mental health, dental, and other specialty care providers. The dental piece is more tied in with the screening process. When the screen was rolled out it could be completed through dental providers as well.

Onto the next screen is slide 14. The TBI screening and evaluation process is in terms of some of the IT implementation and enhancements. As we mentioned before April 2007, the TBI screen was rolled out. This was the four-question TBI clinical reminder. This is the starting point for the process. We realized though that we also had to have consistency, documentation, and what information was addressed during the evaluation. In October 2007 after many months of discussion and consultation with different subject matter experts, the \_\_\_\_\_\_ [00:21:07] TBI evaluation template was rolled out. The VHA Support Service Center was able to help us stand up, in a very short amount of time, the national template to collect the evaluation information. Again, it is in a very consistent and structured interview and evaluation process.

In June of 2012, the more final state – the IT supported TBI evaluation template, which we classified as the comprehensive TBI evaluation template – was released to the field. This gave us a little bit more analytic power, and a little bit more strength in terms of being able to link prior responses to different questions that would be coming in the template. It is specifically relating the responses to questions on alteration of consciousness, post-traumatic amnesia, and loss of consciousness to the confirmation of a TBI diagnosis. I will show you that in a few slides.

October 2013, we developed the comprehensive TBI evaluation reports, which helped us to move our reported of compliance for completion of the evaluation from a more manual system to a more automated system. February 2014, the Concussion Coach, which is a self-care app, was released. The screen shot on this slide is showing you the home page of the Concussion Coach. In August of 2015, we expanded use of TBI instruments to include additional templates that support other program areas. In December 2015, we finished the TBI clinical physician support pilot. This is a pilot through the VA Innovation Office. It was intended to ultimately be possibly a replacement for TBI instruments. What we ended up with in the development was a very strong data collection system, and a very strong analytic system. But the user interface was not quite responsive enough to roll this out as a clinical tool. This is something if you have a program as a researcher, if you have a project or if you are looking for a way to collect and analyze your data; this is something that may be useful to you. Please reach out to me. I can connect you with the right people. It is a very nice instrument for that type of a project, and we would like to see it used by researchers if possible. If you do have interest, please reach out to me following the training. Move onto the next slide please.

Slide 15 just gives a little visual of some of the branching logic that we have incorporated into the comprehensive TBI evaluation template. Essentially we are tying earlier responses to the consensus definition of TBI. If you respond that a patient did have loss of consciousness, they had post-traumatic amnesia, or alteration of consciousness; you cannot say that they did not have a TBI. Those elements are essentially the definition of a diagnosis of TBI.

The next slide please is slide 16. This is just showing you some of the additional templates that are available in TBI instruments. Obviously there is the comprehensive TBI evaluation. We also have the TBI follow up assessment. Some of the newer forms that we have released include the Functional Mobility Assessment and the Quebec User Evaluation of Satisfaction with Assisted Technology. These are the assistive technology programs. The VA Low Vision and Visual Functioning Survey is for the Blind Rehabilitation Program. The full Mayo-Portland Adaptability Inventory is the outcome measure that has been used in the Polytrauma Transitional Rehab Program, so the feature program. We have added those instruments in the past few months to try to expand some of the data collection capabilities of the system. Move onto the next slide please.

The CTBA data is as far as monitoring access to the evaluation and clinical services. For those of you who have been familiar with the TBI screening report, we have a target of 95% of all eligible veterans have a screen completed when they access the VA for care. The comprehensive TBI evaluation completion – we have a quarterly report that looks at the timeliness and overall percentage of evaluations completed. These are all based on completed of new evaluation template. Sites that fail the measures must submit a corrective action plan through 10N through the Operations Office and Central Office. Sites that have more than three consecutive quarters of failing the measure are required to have a virtual site visit. It is essentially a conference call or link meeting with our program office and the visiting CMO. Those have proven to be very helpful in moving sites from non-compliance to better performance in this area. Move onto the next slide.

Slide 18 just gives a screen capture of the CTBIE reports for a facility. If you are moving from left to right, the left side shows the timeliness aspects. What are the median days to complete the comprehensive TBI evaluation? The columns on the right-hand side show the overall completion rate. These are available to all the VA users. They can monitor their own performance. They can drill down to individual cases to see if there are any opportunities for improving their local processes. Move onto the next slide please.

With the addition of some of the newer forms, we have also expanded some of the reporting. This is simply a look at the IRCR and M2PI report. It gives an account of the number of templates that are completed. Also for the M2PI, we provide some additional detail that helps to look at the number of more severely injured or severely impacted ratings based on completion of the M2PI.

Lastly, this is onto the next slide – slide 20. This is just a visual. Shane \_\_\_\_\_\_\_ [00:27:29], we had given a presentation earlier looking at TBI clinical decision support. It is a very big process to try to incorporate clinical decision support with the IT components. We are making progress. I think we have moved the arrow slightly in terms of process improvement and developing some additional decision support. Essentially, we are very much focused on this effort in trying to incorporate some additional reporting. One of the pieces that we have just developed and released into production is having the data available through pyramid analytics. This is something we just linked the data in production to the analytic tool. We are beginning to look at that information as to try to determine the best way to roll that out to more users. That type of expansion we are hopeful will help our ability to look at the processes and identify areas where we need to improve our clinical services. With that we will move onto the next slide. I believe we move onto Joel as well.

Joel: Okay, thanks guys. I will take it over from here. I do not think I got too mixed up on the slide deck after I figured out how to use my control button. Thanks Doug. Anyway, on slide 21; as Doug mentioned I am going to take over now and talk about the context of implementation of the TBI screen and evaluation. As Doug mentioned before, we implemented the screen in 2007. As was also mentioned earlier, there was some political pressure on VA to ensure that every service member coming back from a deployment was assessed for a possible concussion or head injury. VA did implement the TBI screen and did it very quickly. There was not time to fully research the screen and provide psychometric data before it was implemented. Therefore, we have tried to work very hard to make this data accessible to researchers and do some of the psychometric validation after the fact. A lot of this is done through assistance with the polytrauma blast-related injury QUERI. As many of you know, the QUERI structure has changed in the past year. In the QUERI’s prior version, we are very fortunate to have a QUERI focused on TBI polytrauma. The TBI screening and evaluation was one of the highest priorities looking at both the psychometric properties and how the screening was implemented.

On slide 22 you can see some information about the TBI screen. I want to caution you about the first bullet – the sensitivity that I listed there between 85 and 94%. That is really falsely elevated. I think someone has turned – there we go. The sensitivity is a little falsely elevated on this slide. A couple of the studies that showed the higher sensitivity were looking at a population rate where the incidence of TBI was much higher, so they were looking at patient populations in polytrauma clinics. The TBI incidence was much higher. As I mentioned before, the overall positive screen rate is about 20% throughout VA. If you look at the studies with a 20% expectation rate, the sensitivity drops to about 60%. Overall the specificity is about .82. The goal of the screen was really to identify individuals with ongoing symptoms and possible TBI. It is a unique opportunity to have a veteran sit with a TBI specialist to provide a definitive diagnosis and an individualized treatment plan. This was obviously a very unique setting both from a healthcare system perspective and with the political pressure. There have been many publications on the TBI screening and evaluation process. I would encourage you to check out the link at the last bullet on the page looking at TBI screening fact sheets, which list multiple studies and the full range of psychometric properties.

Also when we look at the TBI screen, there are some gender differences. Women are less likely than men to screen positive, but do report a higher degree of symptomatology compared to their male counterparts. This is again looking at the symptom inventory that is part of the comprehensive TBI evaluation. We will talk a little bit about the cost and utilization with the various diagnoses in just a bit.

This is just a screen shot of one of the tables from a study that we did looking at the first 55,000 veterans that completed a comprehensive TBI evaluation. The neurobehavioral symptom inventory we collected that data. This just shows the degree of symptom interference that veterans were reporting. You can see it is a very highly symptomatic cohort. In this group there were 82% of respondents that actually listed irritability as being moderate to very severe interference over the last 30 days. Then as you kind of go down the list, you can see the frequency decreases. But again it is very common for individuals to endorse almost every symptom of that 22 item symptom checklist.

As I mentioned before, the costs associated with TBI care are much higher for veterans with a TBI than those without. The polytrauma QUERI, which was focused on this – Brent Taylor out of the Minneapolis VA in close collaboration with the Polytrauma QUERI Team as well as the Physical Medicine and Rehabilitation Program office led a study of administrative data to look at the cost and the rate of co-occurring mental health and pain related conditions. This resulted in some really great data, analysis, and results. We can just forward to this. The first publication utilizing this report was published in *Medical Care* in 2012. Here is a table looking at the prevalence of the diagnoses. The first column to the left is veterans OEF/OIF/OND veterans with the TBI diagnosis utilizing VHA in 2009. Six percent of that cohort had a TBI diagnosis. Then as you go down the list you can see the prevalence of either mental health of pain diagnoses in that cohort. If you go all the way to the bottom and look at all veterans with a TBI diagnosis utilizing VHA for healthcare in 2009, 54% also had a PTSD and a pain diagnosis.

Then when we look at cost, this breaks down the cost of the unique cohort of those veterans. The first line is veterans without TBI pain or PTSD diagnosis. That was about half of the OEF/OIF cohort. Our median cost was $978. Then if you go all the way down to the bottom, the veteran cohort with TBI, pain, and a PTSD diagnosis – again only 3.6% of that OEF/OIF cohort. That median cost was much higher at $7974. These utilization reports really provided some very interesting data on cost of this cohort. This was somewhat similar to the congressional budget office report that came out in February 2012 showing that veterans with both a TBI and PTSD diagnosis were much higher cost than those with one, the other, or neither diagnosis.

Dave Cifu led another study combining three years of utilization data that was published in *JRRD*. Here is the cover of that publication. This table shows looking at over the successive years of 2009, 2010, and 2011 as well as the combined total on the far right column. Looking at all the OEF/OIF veterans over those three years, about 9.6% have a TBI diagnosis, 40% with a pain diagnosis, and 29% with a PTSD diagnosis. Molly, we have our next polling question.

Molly: Thank you. I will take control really quick and we will launch this final one for our attendees. The best way to differentiate etiology of symptoms in an individual with a history of mild TBI and PTSD is brain MRI, brain SPECT scan, DTI, neuropsychological testing, or clinical interview. Please take just a moment to consider those options, and click the circle next to your response. It looks like people are giving this one a little bit of time to think, and that is fine. We are just about half response rate and people are still submitting their answers. We will give them a little bit more time. All right, it looks like we have capped off at about two-thirds percent response rate. I see a pretty clear trend. I am going to go ahead and close the poll and share those results. As you can see on our screen, 5% of our respondents selected brain MRI, 2% brain SPECT scan, 3% DTI, 41% neuropsychological testing, and 49% clinical interview. Thank you to those respondents. Joel I will give you that pop-up again.

Joel: Okay, thanks Molly. Great, thanks everyone for answering that question. As of yet, still the best way to differentiate symptoms is really that of clinical interview. There is really no way to objectively differentiate which is causing the symptoms – TBI or PTSD. Certainly there are many imaging studies potentially looking at this, but none have been thoroughly validated yet and certainly not ready to deploy into clinical practice. With neurological testing, as a young clinician at the Tampa VA, I am not sure if Dr. Rodney Vanderploeg is on the line. I had many conversations with Rodney thinking that with neuropsych testing they should be able to differentiate. That unfortunately is not the case. However, we do know that all good neuropsychologists conduct a very excellent clinical interview, and that can somewhat help to differentiate some of these symptoms. Certainly it can provide the diagnosis. We are moving on.

We talked about how this is a very challenging and complex cohort with complex comorbid conditions. What is really the standard of care for treatment for mild TBI? Can we use administrative data to really answer that? This is a challenging question because of the use of a very individualized treatment plan. We do have the clinical practice guidelines that are available on the web link on this slide. They have been developed from the best available evidence as well as consensus opinion. They were initially published in 2009, and a work group from VA and DoD worked on upgrading these TPGs in 2015. They are finalizing their reports. We anticipate a publication of the updated CPGs in the next several months. Dr. David Cifu was our VA lead on that and some others. Maybe some of you on the call were part of that work group, so we certainly appreciate your hard work in that area. We anticipate that publication of those updates soon.

As I mentioned before, when it comes to treatment following mild TBI and again in the VA for those individuals who have sustained a deployment related concussion, this is complex because we are typically seeing the veteran many months to possibly years after the traumatic event. The treatment is very individualized. In 2010 Congress mandated that VA develop an individualized plan for veterans and service members with a traumatic brain injury that are requiring rehabilitation. According to legislation, the plan has to be in writing and contain all these components. If you want to look further at this, you can check out VHA Handbook 1172.01 for some very light bedtime reading. It fully describes our individualized rehab and community integration care plan process.

Basically the program office then put together an algorithm to help sites figure out who needed the care plan. Basically, if a veteran has a TBI diagnosis, they have had an outpatient visit with the polytrauma team or the rehabilitation team, and require a skilled therapy for TBI related issue, and are requiring case management; they need an IRCR or that individualized care plan. As Doug mentioned earlier, we have an electronic template that helps teams capture that information. Because it is in a formalized template, we are able to then monitor legalization of that template.

On this slide, again when this template was implemented we do not actually have a well validated metric for how many care plans an individual site would need to implement. Again, it is more based on the individual veteran. In the Washington DC at my Polytrauma Network Site that I work with, we did a chart review for all veterans seen within calendar year 2013. We did find that we were doing a pretty good job. But we did find out that 16% of all the veterans we were seeing at our site, we were not compliant with actually following that algorithm after doing a chart review. Some of the reasons for that was timing where we were seeing veterans that have a care plan in calendar year ’13, but they maybe had it in early calendar year ’14. It was the timing. The biggest challenge for those veterans who did not have a TBI polytrauma case manager assigned to them was it was much harder to track their care and make sure they were being reviewed by the team and having the documentation. We were able to implement quality improvement measures to improve our documentation at the time of the evaluation. We work with our medical providers that were completing the comprehensive TBI evaluations to better document their clinical thought process at the time of the evaluation. Whether what therapy they were ordering, if it was due to a TBI related issue or if the therapy was ordered for a comorbid issue such as \_\_\_\_\_\_ [00:46:29]. If the recommendation was for an individual that may have had a history of concussion but engagement for PTSD psychotherapy, that was done specifically. The clinician felt that it was being done for PTSD rather than just a mental health work flow for a hood related issue secondary to TBI. One was improving our documentation, and then the other was getting a tighter control over who met the criteria for an IRCR. Our plan is to go back and look at our 2014 and 2015 data to see if our improvement process has made any difference.

As I mentioned before, on the next slide here the IRCR is the national template that is available in the TBI tool section. It is as well as the Mayo-Portland Participation Index, which the program office has recommended as an objective outcome measure to utilize for veterans for receiving TBI rehabilitation in an outpatient setting. FI15 or a little over 9500 individual veterans that had an IRCR care plan documented in that template, and then about 5600 MTTI entries. Then we have some investigators that are working on protocols to practice that data and do a more thorough investigation of what our administrative data means and try to find some trends in that data that might be helpful for all of our VHA teams. We spent a lot of time today covering the development of the TBI screen as well as the comprehensive evaluation process.

There have been a lot of studies on this process, but there are certainly more opportunities for future investigation. That is why we were delighted that Dr. Dipoma [PH] and Molly invited us to present on this call today. There is certainly an opportunity to better study and define a standard of care treatment for veterans with a history of concussion and multiple comorbid conditions that can occur. We do know that there are some studies and some work that continue to be done through Brant Taylor and Nina Sayer at the Minneapolis VA. Those studies we are hoping will be published soon. They are looking at the admin data and trying to define what is treatment following a TBI diagnosis. There are certainly opportunities to quantify what a rehab dose is. Even if we are recommending a specific therapy following a TBI diagnosis, what is the therapeutic dose of those interventions? How many sessions of physical therapy would one need if a veteran with TBI, dizziness, or balance impairment were referred to vestibular therapy?

At the TBI State of the Art conference last August there was a lot of discussion about the clinical practice guidelines, if teams and sites are adhering to those CTGs, and if there was a way to better link outcomes of individuals that follow the CTGs. What would happen with that? That is certainly an opportunity. We would love to see a better look at different tier novels that help to maximize veteran engagement in their care plan. Again, these plans are individualized based on the individual veterans. How can we better engage veterans, their caregivers, and their family support to improve treatment? There are also opportunities to look at the future of the TBI screen. Many of you may have read. There was a point-counterpoint article that was published in *JHTR* a year or two ago. Again, Rodney Vanderploeg wrote the counterpoint and I led on the point for why to continue TBI screen versus why the TBI screen should go away. At some point we will need to determine what to do with the TBI screen because the wars have wound down and there are fewer veterans that have been in the deployed status. How will we transition off of that TBI screen? Should we transition more to a symptom specific screen rather because care and treatment is delivered based on current symptomatology for this cohort with complex comorbidities? Also the other possibility is should we do a de-implementation study and see if some sites turned off the TBI screen and identified those veterans in a different manner, what would that be. How would that look? That would be a unique opportunity.

Other opportunities would include looking at the efficiency of interdisciplinary teams. We know it is challenging for teams to block time to sit down, meet together, and talk about how individual veterans are doing. Then it is even more complex and challenging to schedule time to have the veteran and their family there. How can we maximize the efficiency of these various skilled teams and get everyone at the table together? There are opportunities to look at TBI in a chronic disease model. There are certain groups – particularly the Galveston TBI meeting looking at encouraging everyone to look at TBI in a chronic disease model. Should that be just for veterans of moderate and severe TBI, or should it be with mild? There are certain questions to study that way.

Also with care coordination between our polytrauma teams, \_\_\_\_\_\_ [00:53:53] teams, mental health teams; and then how best to provide care or case management are certainly opportunities to look at how to best manage or work with this cohort. I listed lots of opportunities. If you are an investigator that would like to consider any of these opportunities and would like to discuss more, please reach out to us. Then with that, I think we have covered all of our slides. We have a couple of slides here that list just some selected references and resources.

On this slide here I would encourage you to check out these websites that we have listed here. The CPGs for compression and mild TBI are available on the website here as well as the Family Care Map, which was developed by the part from the QUERI. The Polytrauma Utilization Reports for veterans with TBI are available as well as the TBI screening and evaluation fact sheet. One last plug is as Doug mentioned, there was a link earlier in the slides with education and training opportunities for sites that are interested in deploying the TBI Telehealth Evaluation Process. If you have any questions about that or any interest, again please contact either Doug or myself. We would be more than happy to discuss that opportunity with you for your site. I will turn it back to you Molly. I have our contact information here. Thank you all very much.

Molly: Great, thank you both. For our attendees, the supplemental materials they were referencing can be found at the end of the handouts if you downloaded those. We do have some good pending questions and we will jump right into them. In addition to the 82,000 plus positive screenings, how many are added relative to those presenting with TBI diagnosis from the DoD?

Doug Bidelspach: This is Doug. I do not have that number right off the top of my head – the most current number. I believe I want to say it is about an additional 15,000 or so through the course of April 2007 to now. The prior diagnosis may be DoD. It may have been from another provider or another site, just not documented in that process. There are a considerable number. The important piece is they are coming in through primary care and through the other providers. The guidance is those patients still would be referred to a Polytrauma Clinic if they have symptoms that need to be addressed. It is just that they would not go through the comprehensive TBI evaluation template as a patient that screens positive versus having a prior diagnosis.

Molly: Thank you for that reply. Joel, I believe this one came in when you were speaking. We just wanted some clarification. Did you say that the specificity was 82%?

Joel: Yes, the average specificity is about 82%. If you look, here is the link to the TBI screening evaluation fact sheet. This gives a little more detail in there. The average specificity is about 82%, so the specificity is generally higher than that as specificity when you look at all the studies combined.

Molly: Thank you. Is there any data on vision changes within the symptom severity?

Doug Bidelspach: On the Neurobehavioral Symptom Inventory, there is a question about change in vision. The veterans report mild, moderate, severe, or very severe. I might be able to go back to that. Close your eyes if you get dizzy as I rapidly go back through these slides. I am just looking here. It does not show up on the table that I have in this study here. I am not sure exactly what slide this is. There is some. If you go to that full article, it would be listed on the report of veterans saying about vision changes.

Molly: Thank you. Are there any services that address the mental health needs specifically for TBI?

Joel: I think that is done at every site, but it may be done a little differently at each site based on which assets, care assets, or availability. Some sites have psychologists embedded on the TBI Polytrauma Team. Those sites, the psychologists or if they have a psychiatrist on the team are truly engaged in the interdisciplinary process and probably are a little more individualized for those veterans with traumatic brain injury. Other sites have maybe separate campuses of their mental health treatment teams. We have encouraged all sites to collaborate in the best way that they can with their mental health teams. Did that answer your question? Doug, did you have anything else to add?

Doug Bidelspach: No, I do not have anything more specific. I think you are right. I mean that is incorporated into the team approach at each site. It can vary in terms of how that appears or how that is coordinated, but in general that linkage between the polytrauma rehab, primary care, mental health – depending upon the severity and intensity of symptoms, those referrals and team coordination is provided a little bit differently at each site.

Molly: Thank you both. You mentioned a need for models to enhance veteran/caregiver engagement in care. Have veterans and caregivers engaged in research to inform system of care improvements?

Joel: I think to a degree, yes. Many of the HSRND centers that I am aware of have veterans or caregivers that are a part of their advisory group. I think I believe HSRND encourages that participation. Even at research teams to include that collaboration, I am not sure if Dr. Dipoma [PH] has any thoughts from ORD or from HSRND. We certainly from the program office strongly encourage engagement for clinical care to include the caregiver and the support system for the veterans.

Molly: They followed up with what input from veterans and caregivers would you find most useful.

Joel: I believe I think studying what matters the most to veterans and their caregivers. I think when we come to a clinic or a clinical scenario; we are approaching it as a clinician. It is important to realize that every veteran has a very unique situation. Their symptoms for TBI and whatever comorbidities that might also be occurring affect them in a unique manner. The treatment plan, if it can include their specific – if it addresses the specific way those symptoms are felt to address their overall function and level of independence; if it is more tailored to the individual veteran I would think it would be more likely to be. The veteran would be more likely to adhere to that treatment plan and be engaged in their treatment. We do know that veterans who are actively engaged in their treatment plan tend to do better. We would say they are more compliant. Hopefully when we look at the effective interventions for TBI, most of those interventions are not necessarily medications. They are more active types of interventions such as counseling, therapy, maintaining an active exercise plan, and sleep hygiene techniques. All of those things are a little tougher to abide by than just taking a pill once or twice a day. Anything that we can do to study how to better engage veterans and caregivers I think in the treatment planning would be a win for not only the veterans but the entire system of care.

Molly: Thank you. That is our final pending question. I want to thank you both so much for lending your expertise. Thank you to Dr. Dipoma [PH] for getting this presentation scheduled. I want to give you both the opportunity to make any concluding comments if you would like. Doug, we can go ahead and start with you.

Doug Bidelspach: No, I do not have anything new I guess. I would echo Joel’s comments that if you have thoughts on different areas or topics that you would like to discuss with us, certainly we are very accessible. Reach out and we will gladly engage in those discussions. I think as Joel mentioned, thinking not only with the caregivers but the clinicians in the field; having that feedback from the larger perspective of overseeing a system of care, feedback from the clinicians, and feedback from the patients and caregivers are all valuable to have. It is to really assess and see how you can improve the overall process. If you have thoughts on research, if you have thoughts on any of the other areas that really impact the system of care, please reach out to us. We greatly appreciate that information.

Molly: Thank you. Joel, did you want to say any last words?

Joel: Yes, I just wanted to thank everyone for tuning in today and to acknowledge the fact that we are now at our ten year anniversary for the Polytrauma System of Care. We certainly have lots to celebrate in those ten years, but there is certainly more work to be done. This is a great opportunity for us to at least raise some of the challenges that we face when we look to better collaborate with researchers in the field, and for our field based partners to come through with care profession with TBI and polytrauma. Thank you again. Big thanks to Doug and the entire team in our program office for doing just a tremendous job with providing care for veterans with TBI and polytrauma. They are capturing all of this data and making it accessible to the field. Thank you very much.

Molly: Excellent, thank you. I also want to thank your attendees for joining us today. I do want to let you know that we have another TBI cyber seminar coming up next Tuesday, February 2nd. The topic will be the assessment and treatment of influence of concussion on persistent post-concussive emotional somatic and neurocognitive symptoms. Please do go to our cyber seminar registration catalog and sign up for that. Just so you know, this session was recorded and you will receive a follow-up email with a link leading to the archived recording. I am going to close out the session now. But I want to let our attendees know that a feedback survey is going to pop up on your screen. Please take just a second to respond to those few questions. We do look very closely at your responses. Thank you once again everyone. This does conclude today’s HSRND cyber seminar, so have a wonderful day.