



**Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury
Webinar Series**

“Post-deployment Gender Differences in PTSD, Unhealthy Drinking”

October 27, 2016 1-2:30 p.m. (ET)

Operator: Welcome and thank you for standing by. At this time, all participants are in a listen only mode. Today's conference is being recorded. If you have any objections, you may disconnect at this time. Now, I'd like to turn the meeting over to Major Demietrice Pittman. Thank you. You may begin.

MAJ Pittman: Thank you. Good morning, good evening, good afternoon depending on where you are in the world. Thank you for joining us today for DCoE Psychological Health October webinar. My name is Major Demietrice Pittman. I'm a clinical psychologist and psychological health subject matter expert at the Deployment Health Clinical Center. I'll be your moderator for today's webinar.

Today's presentation and resource list are available for download from the files pod below.

Before we begin, let us review some webinar details. Live closed captioning is available through the Federal Relay Conference Captioning. Please see the pod below for presentation slides. If you experience technical difficulties, please visit dcoe.mil/webinars and click on the troubleshooting link under the monthly webinar heading. There may be an audio delay as we advance the slide in the presentation. Please be patient as the connection catches up with the speaker's comments.

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I will now move on to today's webinar "Post-deployment Gender Differences and PTSD, Unhealthy Drinking".

Female service members play an integral role in US military history and current operations. Women fill approximately 10% of all positions among deployed forces in recent conflicts, yet, there is limited research specific to women's combat experiences and post-deployment problems. This presentation will induce attendees to recent research that focus on female service members and post-deployment gender difference in posttraumatic stress disorder, PTSD, and unhealthy drinking. The speakers will discuss VA, DOD, clinical practice guidelines and empirically supported treatments for PTSD and stress diffuse disorders.

At the conclusion of this webinar, participants will be able to discuss gender similarities and differences in combat exposures and post deployment health problems, identify military and combat related experiences associated with PTSD and demonstrate empirically supported treatments for PTSD and alcohol use for service members.

I am now happy to introduce our presenters, Dr. Adams, Dr. Larsen and Dr. Wooten.

Dr. Adams is a scientist at the Institute for Behavioral Health at Brandeis University's Heller School for Social Policy. Her research focuses on alcohol use after traumatic brain injuries and the post-deployment psychological health of military members. Dr. Adams has been a co-investigator on the substance use and psychological injury combat study, which examines the impact of early treatment for post-deployment substance use and the mental health problems with long term post-deployment outcomes.

Along with her Brandeis colleagues, she is examining pain management strategies for treating military members for chronic pain in a role of complimentary and integrative medicine as a compliment or a substitute to [inaudible 00:04:25] opioid treatment. She has examined the impacts of deployment on the healthcare utilization of military spouses and children.

Dr. Adams has a without compensation appointment at the Denver Veteran's Administration.

Dr. Larson is a senior scientist at the Institute for Behavioral Health, Brandeis University, where she is conducting a portfolio of research on military members and families. She serves on the IOM committee on substance use disorders in the US armed forces and the IOM committee on the assessment of resiliency and Preventative Program for mental and behavioral programs in service members and their families.

With NIDA funding, Dr. Larsen developed a substance use and psychological injury combat study. With funding from the NCCIA, Dr. Larsen is the PI continuing analysis with the SUPIC cohort to examine the

use of opioids in complimentary and integrated medicine when treating Army members with chronic pain. In prior contact with the DOD, she provided scientific analytic support for the Defense Health cost analysis and program evaluations at Tricare management activity, which she reviewed performance of the DOD psychological health counsel and analyzed DOD data to estimate the effects of deployment on military family members.

Dr. Larsen designs and conducts health services research studies that identifying the unmet behavioral health care needs and service utilization patterns of US population.

Dr. Wooten is an assistant professor, University of South Carolina College of Social Work and chair of the military special [inaudible 00:06:06]. She combines over two decades of clinical social work experience with her military background to conduct research on post-deployment health and behavioral health problems and service utilization in military and veteran populations. She is principle investigator of the behavioral health care and Army Warrior Transition Unit, which examines behavioral health problems and service utilization in the Army Warrior Transition Unit using DOD military health systems and the post-deployment health assessment and reassessment data among Army service members who return from OEF, OIF and OND deployments from FY 2008 to FY 2015.

Previous roles of Dr. Wooten include research fellow, US Army Research Institute for Behavioral and Social Sciences, Department of VA Predoctoral Fellow, Child Therapist at Navy Family Advocacy and social work consultant at the Armed Forces Center for Child Protection located at Walter Reed National Military Medical Center.

Dr. Wooten is also a Lt. Colonel in the US Army Reserves with over 27 years of military service as a logistics and operation officer and has over 20 years as a clinical social worker with military and civilian families.

Welcome, Dr. Adams, Dr. Larsen and Dr. Wooten.

Please unmute your lines.

Dr. Adams:

Thank you Major Pittman and thank you to DCoE for inviting us to be here today to present our research with all of you. We look forward to the question and answer session at the end and we plan on saving enough time to hear from all of you.

Okay, we have no significant or relevant financial relationships to disclose and we'd like to note that what we're presenting today are the opinions of us as the authors and do not represent the views of the Department of Defense or NIH.

To begin, we have two polling questions, so we'll bring up the first one here. We're interested in learning more about all of you. Can you please respond with your primary discipline?

Okay, great. It looks like we have a bunch of social workers and a nice diverse group here.

Next, do you work with military populations?

Excellent. Okay, so the majority of you do. That's what we thought.

Great. I'll skip over the learning objectives which Major Pittman already went through.

Women have played an integral role in the military throughout its history. Women represent an increasing portion of the United States military. In 2014, women comprised approximately 15% of the active duty component and almost 19% of the National Guard Reserve component. In terms of the deployments to Iraq and Afghanistan, women have comprised about 10% of those deployments and until 2013, women were formally excluded from direct ground combat. We know that that may be changing for some women now, yet deployments to combat zones inherently involved risks of combat exposures because there's the no front line in the current conflicts and we also know that 20% of women are in dual military families, which brings along with it different potential factors to consider.

Most studies have focused on smaller, convenient samples so the ability to look at women's unique combat experiences and post-deployment problems have been largely unstudied. Women have often been too few in number to analyze separately, so they've either been ignored or dropped and studies generally do not report on women's experiences separately.

More research has been done on women veterans who utilized care in the Veteran's Health Administration but we know that those findings may be biased because many women do not utilize care in the VHA. In fact, it's around 40-50%, we believe, who do not utilize care who are eligible. This requires to be able to look at women's post-deployment problems specifically and the experiences they had while deployed, we really need to begin in the Department of Defense and look at data when they first get back and then follow these women longitudinally after they return home from deployment.

I'm going to turn it over to Dr. Larsen now.

Dr. Larsen:

Thank you, Rachel. Hi everybody.

I'm going to introduce the concept and definition that our studies are based on related to spectrum or trauma and stress disorders, PTSD. I'm

sure that most of you have been exposed to this before, so we just want to set a common framework for everybody. I'll focus on definition and prevalence and later, Dr. Wooten will talk a little bit about suggested treatments.

The definitions we're using ... you can see at the bottom of this slide ... are coming from the VA DOD's clinical practice guidelines. That guideline predates the DSN 5, which you may already be using in your clinical practice. So, our studies are based on the earlier definition.

A PTSD diagnosis, as you know, first requires that there be some kind of trauma exposure for the population, or the person ... so, they've had a traumatic event and then, in our study, we've been looking at traumatic events that follow being in a combat environment or being on a deployment, but as you know, service members and the general population can have a range of traumatic events and service members are not immune from this either, so a service member might also be exposed to a sexual assault, might be a first responder to a natural disaster, might experience a motor vehicle crash, perhaps where one of his colleagues or her colleagues has been killed or could even experience a miscarriage. So, throughout their time with the military, there may be a traumatic event that's combat related or not combat related.

The range, as you can see on this slide ... the range of stress disorders in the military also starts with acute combat stress or combat operational stress reaction, COSR. In our studies, we're looking primarily at the acute and chronic phase of PTSD, which is on the far right of this diagram and those are reactions that occur based on 3 months of symptoms.

This next slide ... in addition to being exposed to this traumatic event, in order to meet qualification for PTSD diagnosis, the individual also would show symptoms in at least 3 clusters. That first cluster should be labeled "Re-experiencing". Re-experiencing symptoms is one area where you'd be asking questions to see if the patient has those kinds of experiences. Intrusive memories, images, perception is an example.

The second area is Avoidance or Emotional Numbing and the third area, Increased Arousal, perhaps demonstrated by irritability. Again, this predates the DSN 5 definitions.

In the VA DOD manual, if these symptoms last for 3 months or longer, then you can call it chronic PTSD diagnosis.

In the next slide just shows some additional words that basically talk about the same kind of symptoms. So, if you see a patient, perhaps in a primary care environment where they're showing these kinds of symptoms, complaining of vague, somatic complaints. They have irritability and this is a change in their functioning, you might want to do an assessment for PTSD.

Here, we're showing you, again, that there's different rates that are coming from different literature, not our studies but prior literature, and the general population, obviously, also has traumatic events and can meet definition. So, you should assume that a military population is going to come in with a baseline rate of exposure and a baseline rate of PTSD and that rate could be 5 or 6 %. You can see, by looking at the general population, the rate is generally higher for women than for men.

Now, looking at the right side of this slide, we present some estimate of PTSD in military populations or in veteran populations. You can see that for men, the prevalence rate is higher than for women, particularly the lifetime prevalence rate. You can see that for me, it's likely that their symptoms last longer and the reason I say that is because the lifetime prevalence is 30% for men, but the current prevalence is 15%. About 50% have ... in other words, about half of the lifetime prevalence, so it's very persistent whereas for women, the lifetime prevalence in the Vietnam Veterans was 27% but the current prevalence is 8%, so the persistence is not quite as long.

Finally, I'd like to introduce this concept of moral injury. As we learn more about PTSD associated with exposure to combat, many of the people you see may fit this definition. A psychologist, Brad Litz, first published this definition in 2009 of moral injury where perpetrating or failing to prevent an event or witnessing things that really go against your moral fiber, your moral beliefs and expectations, especially when this is over a long period of time, can lead to a particularly pernicious form of PTSD. People who have been required to kill as part of their line of duty may experience this but also people who see their companions killed and they wonder why they survived. This can lead to a form of PTSD known as moral injury, which may be particularly troublesome to treat.

I'm going to turn it over to Rachel now to talk about drinking.

Dr. Adams:

Great, and I understand some of you would like us to speak up so we're going to try to do that.

We wanted to introduce some definitions of unhealthy drinking that we're going to be referring to later in the talk. One is binge drinking, which many of you have probably heard of. The NIAAA, which is the National Institute on Alcohol Abuse and Alcoholism within NIH, defines binge drinking as 5 or more drinks on a typical drinking occasion for males and 4 or more for females. The Department of Defense post-deployment Health Assessment screening instruments, which we're going to talk about a lot later with our research, have used a cutoff of 6 or greater for males or females, so a more conservative definition.

We also talk about at-risk drinking, which is screened for on an instrument called the "Audit-C" which is a 3 item screen which gets at frequency and quantity of drinking and also includes an item about binge drinking specifically. A positive screen for at-risk drinking is 4 or greater out of a

scale of 0-12 for males and 3 or greater for females. The Audit-C also allows us to identify those at risk of severe alcohol problems with a score of 8 or greater.

We know that military members drink at higher rates than their same age peers in the general public. This has been shown for decades that drinking is very pervasive in military culture and unhealthy drinking is associated with numerous negative consequences in the military, including job performance problems, criminal justice problems and health related problems. Risk factors for unhealthy drinking are combat exposure, being younger, having a lower enlisted pay grade, having PTSD or also a traumatic brain injury. We know that drinking may be used to self-medicate or cope from the stress that's experiences during deployment so particularly common during the reintegration, post-deployment window period.

Next, we're going to move into some papers that are our Brandeis team has done and to briefly introduce some of the topics, I have a list here. The first is Gender Differences in pre-deployment diagnosis and treatment in history. We'll talk about gender differences in combat exposure and post-deployment health problems, combat exposure in TBI as risk factors for PTSD and unhealthy drinking and missed opportunities for post-deployment for alcohol prevention.

So, now Dr. Wooten, who's at the University of South Carolina, is going to speak about two of the papers she led for our team.

Dr. Wooten:

Thank you, Rachel. Good afternoon, everyone. I'm going to give you a brief overview of two articles we published that discuss pre-deployment diagnosis and treatment history.

The first one is about gender differences in substance abuse treatment utilization in the year prior to deployment in Army service members. This study involved all Army service members who returned from the OEF, OIF and OND deployments in fiscal year 2010. It was over 152,000 service members and what we found is that 12% of Army women and 14% of Army men who return from deployment in fiscal year 2010 received a substance use diagnosis during their pre-September 11th military service, so that's the time period after the war began, they had this substance use diagnosis and what we also found is that Army women were less likely than Army men to receive substance use treatment the year before deployment so although 12% of those women and 14% of those men had a substance use diagnosis before they deployed, women were less likely than men to receive treatment.

What we overall concluded was there's some gender disparity in substance use treatment and there's some potentially unmet substance use treatment need among Army women, so the take home message for clinicians would be that perhaps Army women are under identified and what I mean by less likely to be identified for alcohol use problems prior to

deployment, maybe that's a result of perhaps that they engage in drinking that gets them less likely in trouble in terms of alcohol related incidents where they would come to the attention of command. Perhaps they are less likely to show up for duty under the influence of alcohol and perhaps engage in more internalized behavior or drinking at home to cope with stress.

The next study I'm going to review is pre-deployment year mental health diagnosis and treatment in deployed Army women, so out of the cohort from the previous study that I discussed, we looked at all the women who were in that cohort so it's just over 14,000 women. We found that a substantial amount, 26% of those women returning from deployment in fiscal year 2010 had PTSD mood adjustment or some other type of anxiety diagnosis before they deployed. 83% received treatment for these diagnosis.

We also found that women were more likely to be diagnosed with a mood disorder than PTSD and we concluded that military women who hadn't received any behavioral health treatment since September 11th had 61% more pre-deployment outpatient mental health visits than those who did not receive any treatment.

The take home message here is that perhaps it's important to note the diagnosis and treatment of women prior to deployment and also perhaps, think about connecting them to treatment during the deployment phase to perhaps prevent further exacerbation of their symptoms prior to deployment.

Next, I'll be followed by Dr. Larsen.

Dr. Larsen:

Thank you, Nikki and I will try to speak up.

Now, I'm going to introduce you to a longitudinal study that we've been conducting that most of the rest of our findings are from. We call it the SUPIC [phonetic 00:25:02] study which is the Substance Use Psychological Injury Combat study, and as I said before, we're following and tracking service members from the Army who are coming back from deployment FY 08 to FY 11 and we're following them for a 3 year period of time.

I'd like to say we have a lot of collaborators. We have some collaborators at the Palo Alto VA, Alex Harris and some others who are conducting this research with us and on the next slide, I'd like to also acknowledge that Dr. Tom Williams from the Defense Health Agency has been a sponsor of this research. We have received funding from NIDA to conduct this research but again, we've been accruing data on a large sample of people, over 640,000 service members, who have returned from deployment. We've been analyzing that data, looking at future outcomes for these folks in terms of their mental health and substance use.

The data are accrued from many different places and this is the advantage of this kind of study, where we're using Defense Health Agency records, medical records, deployment records. You can see this on this slide. Healthcare utilization and in particular, also health assessments that they fill in when they come back from deployment.

On the next slide, I'm going to talk a little bit more about the post-deployment health surveillance data sources that we use and the advantage of these is that first of all, they're implemented for everybody. They're universally implemented when they come back from deployment. It's a program that the DOD started in 2003 in order to help the DOD identify in people who are coming back whether or not there's some needs that could be addressed through additional medical services after deployment.

There's 2 questionnaires, and I think starting in the near future, they'll be adding another questionnaire but during the period of this study, there were two questionnaires. One that was filled in within 30 days after deployment, which most of our data is from and we called it the post-deployment health assessment and then a second one, a follow up survey, completed 3-6 months after they return, or reassessment.

The advantage of this ... I hope I'm speaking loud enough ... the advantage of this is that service members respond to many self-report items and then they're interviewed by a provider and in that interview, the provider has the opportunity to ask additional questions, to do an assessment and to refer them to care. The part we're focusing on is in the area of PTSD, at risk drinking, PBI, combat exposures and other psychological health issues. The version of the questionnaire we analyzed is 2008.

So, looking at some of the gender findings from the PDHA, one area is people report on what kind of injuries did they sustain in their deployment and you can see that the red bars represent the responses of female service members coming back from deployment, the blue, the male members and on the first 2 items, whether or not they screen as being exposed to a TBI or they were exposed to a blast or had an explosion, you can see that women tended to have less exposure than men. 10% of women reported a blast versus 22% of men. Another item asked "Where you wounded, assaulted, or injured," and here you can see that results are almost identical. That's something that we want to continue to explore and it's possible that it's picking up, perhaps, some kind of sexual assault that occurred during deployment or another kind of assault, so even though they're not in combat, the same combat positions as men, women are reporting similar overall rates of wounds, assaults and injuries.

The second area they're asked questions about that we are examining is combat exposure. Again, the female responses are in red. So, the first question great danger of being killed direct combat, discharge or seeing others wounded or killed, these rates were lower for woman than for men

and when you combine did they have any exposure to any of these kinds of things, you can see men, on average, 43% were exposed to one of these events, woman it was 28%, so not surprising, their combat exposure was low but it's not insignificant.

Then, finally, they're also asked about current symptoms that they have and you can see that women tended to respond more frequently that they were having emotional difficulties, that they're health was poorer and while they were deployed, they report more frequently visiting a healthcare provider ... were more likely to visit a healthcare provider 4 times or longer. That was greater than for men.

Last, there are questions where we can assess if they screen positive for at risk alcohol use or depression or PTSD. You can see that in terms of alcohol use, not surprisingly, the women were less likely to screen positive where when it came to depression and PTSD, the women have a little bit more positive responses to depression and the same rate for PTSD.

Now, I'm turning it over to Rachel.

Dr. Adams:

Great. Thank you. Now we're going to talk about a specific paper that we just had come out where we decided to look specifically at Army women and dig a little bit deeper because of this gap in the literature that we were talking about earlier. So, this paper looks at is combat exposure, a risk factor for PTSD and at risk drinking among women. We used a sub-sample of the larger SUPIC study, so we identified all female enlisted Army OEF, OIF deployers returning within the fiscal year 08 to 11 window and we had a sample of over 42,000 women, which is quite large.

About 2/3's of them were active duty and 1/3 were National Guard Reserve members. Previous studies have found that combat exposure is associated with post-deployment problems including PTSD, depression and at risk drinking, yet, the generalizability of these studies to women members is limited because, as I mentioned, females were only a smaller portion of deployed populations and studies have generally relied on smaller, convenient samples so they didn't have enough women to be able to look at this separately.

In this table, we present the prevalence of self-reported injuries and combat exposure by components so these are some of the same items that Dr. Larsen just presented earlier comparing women to men and here we have the reports of combat exposure for active duty women and National Guard Reserve and you'll see there are some differences between the two components, specifically with the first item "Where you wounded, injured, assaulted or hurt," 17% of active duty women report experiencing this on their last deployment, while 29% of National Guard Reserve women, so that's a very high rate and we're interested in understanding more about that, what that's capturing.

Over 15% of active duty and 11% of National Guard Reserve report encountering dead bodies or seeing people wounded. Very few women, so less than 1% or around 1%, report engaging in direct combat where they discharged a weapon and that's not surprising given the time frame in which we conducted this study. About 18-19% felt in great danger of being killed on the previous deployment.

We constructed a combat exposure score, which is detailed at the bottom of this table, just to show how many women reported 1 or more of these 4 items and you'll see that for active duty, a little over a 1/4 reported one item and 31% of National Guard Reserve women reported 1 combat exposure item and then 2 or greater was about 11 or 12% of both component reported at least 2 combat exposure items.

Our two outcome measures that we're going to look at for our models are a positive PTSD screen, which we identified with the primary care PTSD screen, which is included on the DOD's post-deployment health assessment and here it is considered a positive screen if it's a 3 or greater score out of a possible score of 4 and then we looked for a positive screen for at risk drinking, which uses the Audit-C on the PDHA and for that a score of 3 or greater for women is considered positive. So, you'll see that 6-7% of women screened positive for PTSD and the very exact same estimate of active duty and National Guard reserve women screen positive for at risk drinking, a much higher 22%.

This table presents our statistical modeling in which we looked at the relationship between combat exposure score and our two different outcomes of PTSD and at risk drinking, so the top table is for active duty women separately. We looked at the two different components separately because we know their experiences are often quite different, particularly when they return home from deployment and you'll see that as ... combat exposure is listed down on the left hand side and then the outcomes are listed across the top of the table and as combat exposure score increases so does the odds of screening positive for PTSD.

Let's walk through this first one together. If you look at combat exposure score of 1, so active duty women who reported 1 type of combat exposure, they had 4.4 times the odds of screening positive for PTSD. Then, among women who had a 3+ score for combat exposure, their odds increased to 20.7 the odds compared to women with no combat exposure of screening positive for PTSD, so there's quite an increase in risk to screen positive. When we looked at these models, we were able to control for various demographic information and deployment history and history of TBI. That's listed at the bottom.

If we look now at the bottom table, which is National Guard reserve women, you'll see that there are very similar estimates for National Guard reserve women when looking at PTSD, so as combat exposure score increased, so did the odds of screening positive for PTSD quite dramatically.

When looking at at risk drinking, we see estimates in a similar direction so increased combat exposure is associated with increased risk of screening positive for at risk drinking yet, the estimates are much lower than the risk for PTSD.

In summary, reports of being wounded, injured, assaulted or hurt are common among female enlisted members. Other reports of combat exposure are also frequent, particularly encountering dead bodies or being in danger of being killed and as combat score increases, there is a significant association with PTSD and at risk drinking. For PTSD, there was a dose response relationship and a very large effect.

There are a few limitations of the study which should be noted. There were only 4 items assessing combat exposure on the post deployment health assessment and we know that when returning from a combat zone, it's possible that these deployments experienced other types of combat exposures which were not included on the survey and we cannot explain reports of being wounded, injured, assaulted or hurt are so common. We do know, as we mentioned earlier, there's no direct assessment of sexual assault on the instrument so it's unclear if this item may be picking up some experiences of that and these questionnaires are not anonymous. The information is shared directly with commanders and it's used to identify people who may need more treatment, so there may be an incentive to under report problems.

In terms of implications, this is among the first population study of active duty and National Guard reserve enlisted women to examine association of combat exposure and post-deployment problems and additional research is needed on the types of combat exposure experienced by women and their unique needs associated with these exposures and there's a need for additional sensitive screening to determine if assaults reported are related to sexual assault and a high proportion of women who deploy to a combat zone may benefit from early prevention and confidential intervention for post-deployment problems.

Here, Dr. Larsen is going to speak a little bit about sexual assault specifically.

Dr. Larsen:

Hi. We wanted to present some additional information to you about the experience of sexual assault in military populations. There's an annual survey conducted by the DOD called "The Workplace Gender Relations" survey and in 2012, when that survey was administered ... and this is an anonymous survey not associated with the surveillance program. When that survey was conducted, 6.1% of women in the military, active duty, 1.2% of men in the military, active duty, reported that in the past year, they had experienced an unwanted sexual contact so that's broader than penetration from a sexual act but does include sexual contact.

In addition, we know there's a range of other behaviors that are on that survey including sexist behavior and sexual harassment. 50% of the men

and women reported that that unwanted sexual contact was from a military coworker and we know that this estimate is much higher than the rates that are reported to the military, so this is based on actual occurrence as opposed to what are reported.

We just wanted to remind everybody that this kind of experience, obviously, is a risk factor for PTSD and alcohol use and back to Rachel.

Dr. Adams:

Okay. So, I'm going to briefly present a little bit on another paper that we did in which we look at TBI specifically as a risk factor for post-deployment drinking and TBI's relationship with Posttraumatic stress disorder. We know that the same ideology that contributes to a TBI, such as blast injury, may contribute to the development of PTSD and TBI and PTSD are highly correlated and some of the signs of symptoms associated with both conditions overlap. TBI may increase the likelihood of developing PTSD for some and may also complicate recovery from PTSD.

This paper looked at a different data source. It looked at the 2008 Department of Defense Survey of Health Related Behaviors among active duty military personnel which is an anonymous survey, self report and self administered and here I'm just going to quickly summarize some of our results.

We were looking at what predicted the odds of frequent binge drinking in the past month, which is defined as binge drinking at least weekly in the past month and what we found is that the odds of frequent binge drinking were increased specifically for males, specifically for those with a history of TBI on the deployment that they were returning from and they were getting back from deployment within the past year and particularly for those with a TBI who had loss consciousness of at least a minute long ... and this is self reported ... and also, for those with a positive PTSD screen. So, PTSD was associated with greater frequent binge drinking upon returning home.

Now, I'm going to turn it back to Dr. Larsen.

Dr. Larsen:

Thank you.

We also conducted some research on what's the response of the providers when they interview people who screen positive. This particular paper that was published in the American Journal of Public Health ... and I think we also have sent you a copy of it. We're looking at a sub-sample of people who finished the PDHA coming back from deployment, army active duty.

Here's, in a nutshell, what we found. We found that of the men and women who screened positive for ... you would say hazardous level or harmful level of alcohol use, in this case 7+, that 27-28% of them were not identified as having an alcohol problem by the interviewing provider at

that time. We considered that as a missed opportunity for some kind of prevention messages or a missed opportunity for an early intervention.

In addition, of the people who screened 8+ who are most likely going to screen positive for alcohol dependence, we found that 60% of those folks were not referred on to primary care for additional discussion. We didn't look at this stratified by males versus females but we called this a missed opportunity for early intervention for alcohol problems.

We also looked at screening for PTSD and depression and at risk self harm or harm to others. We combined those alcohol positive screens with mental health positive screens and called those behavioral health screens, BH. You can see here ... here's the total response to the surveys, so the majority, 67%, did not report any kind of behavioral health problem that might require follow up, but a substantial minority did and in the green slot, you can see, these were people that screened positive for one of the behavioral health problems and also had a referral. About 7% of the total population.

But, 9% of the population screened positive for one of these problems and did not receive a referral. Again, the missed opportunity and in that group, we've exploded that on the right hand side of the chart. You can see that the majority had a mental health symptom only but a large number had the alcohol only and given the relative prevalence of these primarily when alcohol is identified as the problem, that's when the providers do not refer on.

The next slide talks a little bit about implications. That even though they're certainly under-reporting these self report measures that many service members, when they come back from deployment, are having positive screens and these screens, at least on the PDHA, are not being followed up by the providers in terms of getting additional assessment or a brief intervention. We call it a missed opportunity because we think that there should be ways to increase provider recognition, that these risks, especially for alcohol, could also be associated with other positive screens, so essentially cannot rely on soldier self report of their ... we also discovered that you can non rely on soldier self report of their own concern about alcohol use. A small minority of the people who screen positive said that they themselves were concerned about their alcohol. That's an insufficient way to screen.

We wish we did have more information from the PDHA in terms of which kinds of providers are more likely to recognize these problems, are more likely to refer people on. Is it related to discipline? Is it related to training? We don't know that from the PDHA.

I'm passing this on now to Dr. Wooten.

Dr. Wooten:

Now, we will shift and have a discussion about screening, assessment and treatment. The publication and implementation of the VA DOD

Clinical Practice Guidelines was an effort by the VA and DOD to encourage access to quality care for military and veteran populations and also to encourage clinicians to engage in best practices when treating conditions, health and mental health conditions that are common amongst military and veteran populations. They are publicly available on the VA website and you can have access to them and I'm going to review the one for PTSD and substance use disorder.

The management of posttraumatic stress disorder and acute stress reaction. The recommendation is that individuals are screened with the primary care PTSD screen and the PTSD checklist, which is 17 items. There are different versions, the civilian, military and stressor specific version and based on the DSM 5 criteria, there's also the PCL 5. The psychotherapy interventions that are recommended include trauma focus cycle therapies, which have a significant benefit. The stress inoculation training, which also has a significant benefit and then psycho-education, imagery rehearsal therapy, psycho-dynamic therapy, which has been found to have some benefit, but your trauma focused therapies are most common and most of you may be familiar with, which includes prolonged exposure, cognitive processing therapy and EMDR.

The management of substance abuse disorder. The recommendation for screening is your Audit-C and here you have the 3 questions that are typically asked. You also have a single item, alcohol screening questionnaire, which asks do you sometimes drink beer, wine or other alcoholic beverages followed by a screening question - men, five or more drinks in a day and women, four or more drinks in a day.

There are recommended psycho-social interventions which includes the brief alcohol intervention. It's recommended for adults to screen positive for unhealthy alcohol use and for women, that's an Audit-C score of 3 or more and for men, it's an Audit-C score of 4 or more. This is a psycho-education intervention that focus on the risks of alcohol related drinking and advice to abstain from unhealthy drinking.

Positive behavior therapy is also recommended by the VA DOD Clinical Practice Guidelines and it focuses on the modification of thinking and behaviors related to alcohol use or any type of substance use and to change any life circumstances that facilitates or encourages problematic alcohol use.

In terms of PTSD treatment, cognitive processing therapy has been determined to be the best practice model for PTSD in adults based on the International Society for Traumatic Stress Studies. CPT is based on the premise that PTSD results from a failure to recover from a traumatic event and that post trauma reactions prevents recovery. So, some of your hallmark treatment strategies include writing the trauma narrative and also addressing step points which is a difference between thoughts prior to the traumatic events and thoughts and belief they have after a traumatic event. It can be implemented in an individual or group setting or

a combination of both. They're typically 12 sessions with a recommended follow up session one month later.

During phase 1, when you analyze, gather information and identify feelings, you would do the impact statement, which is based on the trauma that specifically focusing on in cognitive processing therapy and also a written account of the trauma on the traumatic event. For those who have TBI, you may come up with a more creative way for them to write up their trauma event or do their trauma narrative, which can be done by the use of technology such as recording their traumatic event.

Then, phase 2 is the challenge phase. You're going to challenge those step points. You may engage in questions that may challenge the evidence that facilitates the step points and you also address problematic behaviors that may be a result of those negative thoughts and cognition's that facilitate the thoughts and the step points related to the trauma narrative.

Phase 3 is focusing on change. You're changing your beliefs and you're changing the behaviors that are related to the trauma themes based on the trauma narrative.

The next PTSD treatment is prolonged exposure. Prolonged exposure addresses the fear that activates the fight or flight response. So, the premise here for prolonged exposure is that there's an over-generalization of the fear response related to the traumatic event that results in avoidance behavior or negative trauma related cognition's. It's basically implemented in 10-12 90 minute individual treatment sessions conducted once or twice weekly and it's recommended that there not be more than 10 days between sessions.

There are 4 primary components. The repeat revisiting of the trauma memories, the repeat exposure to avoid the situation, which is avoidance, psycho-education about common reactions to trauma, you want to normalize the trauma and breathing retraining. Breathing retraining is not recommended during your imaginal or your in vivo in your prolonged exposures but repeated revisiting of the trauma memories help one engage in emotional processing of the trauma memories and the idea is to get the client comfortable with the negative emotions and thoughts that are associated with the trauma memory so that they no longer consider them dangerous, so that's why there's prolonged exposure to the traumatic memory and it's always very homework intensive.

Next, we're going to look at substance use disorder treatment. Cognitive behavioral therapy is recommended for substance use disorder treatment. It's a structured, short-term here and now psycho-therapy. There really isn't any focus on the history of the client, it's focused on what they're experiencing in the here and now. There are 6-14 weekly sessions and there are booster sessions that may be held every 3 months after termination from treatment. The focus when you use CBT for

substance use disorders is on abstinence or reducing the substance use and modifying dysfunctional thinking and behavior related to substance use.

There's also a focus on relapse prevention which focuses on life circumstances or thoughts and behaviors that may facilitate or encourage substance use.

Next, we're going to look at PTSD and substance use treatment, the co-morbid treatment for women, and although it's not recommended by the VA DOD Clinical Practice Guidelines, "Seeking Safety" has been used very often with women who have co-morbid PTSD and substance use disorder. It's also a cognitive behavioral therapy that was originally developed to treat women who had traumatic experiences and had core occurring PTSD and substance use disorder. It's currently implemented in individual and group modalities and it's also been adapted for co-educational groups, same sex groups for men and inpatient and outpatient settings.

It's also a manualized treatment that addresses 25 topics within 4 domains. Your cognition's, your behaviors, some interpersonal problems, as well as case management.

Finally, we'd like to thank you for participating in our webinar today and this is our contact information. I'll turn it back over to our moderator.

MAJ Pittman:

Alright, thank you so much for the presentation Dr. Larsen, Dr. Wooten and Dr. Adams. It's now to answer questions from the audience. If you have not already done so, please submit questions via the question pod located on the screen. We will respond to as many questions as time permits.

I know a couple questions came in while we were talking so I will go ahead and ask the first question.

It says "In this research that is currently been done at Brandeis by Dr. Larsen and Dr. Adams, are you also finding that that rates of PTSD, depression and anxiety have increased since women's inclusion to the direct ground combat in 2013?"

Dr. Adams:

I can answer that. The time period of our current SUPIC analysis that we are presenting today and what we've done so far looks at service members returning up through fiscal year 11 and we look at the year after that, the year or 2 after that so the policy changes started around 2013, so thus far we haven't been able to look at that specifically. That being said, we do have a new grant which has extended the SUPIC cohort to continue to look at ... we acquired additional Army service members returning from deployments through the end of fiscal year 14 ... and we're able to look at them going up to 5 years later, so we will in the future be able to look at a before and after that policy change occurred to see if the

rates do change and I'm sure that internally, within the DOD, they're be looking at that as well.

Dr. Larsen: Thank you, Rachel and just to reiterate. We'll be able to look at whether the rates of exposure to combat has changed and then among those with exposure to combat, whether their response, the positive screens for PTSD or depression changes. You could imagine the scenario where the exposure to combat might increase but the response might not increase if the training changes because they're now in combat positions. So, if the training is intensified and that prepares them for what they're confronting, it's not necessary that the PTSD rates would increase.

MAJ Pittman: Thank you so much. That was a really great answer to that question. We're going to move on to another question. This question is from the audience. "Maybe I missed it, but what assessment was used for TBI screening for PTSD?"

Dr. Larsen: You want to cover that? Okay. The question is about TBI and about PTSD? What were the assessments? Yeah, we didn't say the instruments is what I think. Yeah.

Dr. Adams: Okay, sure. On the PDHA, the assessment that screens for TBI is you have to self-report an exposure event first, which includes a blast, a motor vehicle accident, a fall. There's a couple other things considered an exposure event and then you have to report an alteration of consciousness associated with that event. So, that would be an actual loss of consciousness or being dazed, confused or seeing stars is considered an alteration of consciousness and if a service member reports yes to both of those items, they screen possible for possible TBI. Now, that does not include having to exhibit symptoms associated with the TBI after the event or current symptoms which is ... the VA looks for those symptoms following the actual exposure event and the alteration of consciousness, too. They screen for TBI with current symptoms often.

The definition we are using is consistent with the CDC and other studies that have been published by Hogue and other people, Millican [phonetic 01:00:41]. We use the instrument that's embedded into the PDHA.

Dr. Larsen: ... and for PTSD, the instrument the PDHA is the primary care PTSD, there's 4 items that are used and if a service member endorses 3 of those 4 items for the past 30 days, then it's considered a positive screen.

Just to answer a question not asked, for depression, it's the 2 items PHQ, Patient Health Questionnaire, that's used for a screen and responding yes to one of the items is considered a positive screen for depression.

MAJ Pittman: If they have a positive on their PHQ, do they go on and administer the PHQ 9 or PHQ 8?

Dr. Larsen: There are instructions that if people screen positive, there should be additional assessment. I don't know exactly which instrument they'll use at that point. There's recommendations, it's not embedded in the PDHA and there's no recording of the response of that assessment in the data systems that we look at. I imagine at the branch level that may be different, that there may be some kind of record of that assessment.

MAJ Pittman: Thank you very much. Very detailed answer to that question. I really appreciate it. The next person, it's a little bit long, so bear with me as I ask it. "As a reservist, I find the variations between active duty and Guard reserves PTSD rates to be surprising. Can you comment on how this may be related to transition factors back into home communities that are geographically separated from military bases or other possible factors?"

Dr. Adams: Do you want to take this?

Dr. Larsen: Sure, I don't know if we should go back to that slide, but Rachel reported ... so, thank you for the question. I know there's a lot of discussion about this, so Rachel reported some numbers that did show differences between women in terms of their self-reported injuries and combat exposure. What I find interesting is that the question "Were you wounded, injured, assaulted or hurt?" 17% of active duty women report that, 29% of National Guard reservists report that. That's not a question that's picking up reintegration issues or picking up stress issues. That's a question that says the kinds of occupations that National Guard and reserve women are in and the kinds of units that they're deploying with is leading to a higher combat exposure for them than for active duty women, which is perhaps surprising.

Then, we she constructs the combat score, of course, the National Guard women experience higher rates, so then, when you look at the rates of PTSD and the rates of at risk drinking, those rates are actually more comparable among National Guard women and active duty women, just like the overall levels, so they're experiencing more combat but they're reporting the same rates of positive screens for PTSD and at risk drinking, so I agree they are interesting findings.

MAJ Pittman: Thank you so much. I have another question outfitted to screening and self-reporting. "Does the self-reporting for SUD allow service members to identify reasons for their substance use and if so, what differences is this between male and female service members?"

Dr. Larsen: Again, the AUDIT-C items that are asked would not get at reasons. It probably is a little awkward to be screening people immediately after deployment on alcohol. Again, the follow up questions that the provider asks may get at reasons, like how frequently do you drink at this level. There may be additional assessment so the provider says, okay, this is an unusual environment or unusual occasion. This is not their typical drinking.

Would there be differences between men and women? Rachel or Nikki, do you want to?

Dr. Adams: Yeah, I know that the TBI paper I presented you, the Health Related Behavior Survey data which is an anonymous DOD survey, which is very different than the post-deployment health assessments, which are definitely not anonymous and in there, there are a lot of items that do ask about reasons for drinking and how drinking may have changed since they joined the military. I don't know the answers to all of those questions off the top of my head, but I know that those reports from the 2008 survey and the 2011 one are publicly available online.

Dr. Larsen: It's a sensitive question because other kinds of national surveys do ask for to what extent do you use your drinking or take medications or take drugs in response to some of the problems that you're experiencing. So, to what extent do you drink in order to be numb? Do you drink in order to forget? That's not a part of the PDHA, but I think those would be relevant assessment questions.

MAJ Pittman: Along those lines, there's another question about surveys. "Is there a movement to move towards more anonymous reporting of symptoms of mental health and substance use disorders to address military service members stated concerns that report to affect their career promotions, possible prevention, to remain with their assigned units and fear of being pressured out of the military?"

Dr. Larsen: That's a very relevant question. So, I want to remind people that what we're using for our research purposes are not the only kinds of assessments going on inside the military, so this PDHA surveillance program is out of the operational branch of the military but there's also a medical command, or medical branch, for the military and in those settings, such as a primary care setting, I believe it is standard practice that people are encouraged, providers are encouraged, to screen people for their alcohol use, screen people for PTSD and depression, so in those clinical settings, it's not anonymous, it's not the same as ... there you have that patient/provider relationship and so, people may be more comfortable in disclosing.

I think there is a role for anonymous and confidential reporting and the annual surveys that Rachel mentioned, we know a lot of the population level that we don't know at the individual level when people are coming back from deployment and I think there's reason to discuss confidential disclosure to your provider, confidential access to treatment inside the military which is, at this point, pretty difficult to get. Some of the benefits would be earlier treatment so that's something for people to consider.

MAJ Pittman: Great. Let's move on to a couple questions in terms of treatment since you talked about treatment. "Do recommended treatment plans change when PTSD has a moral injury component and if so, how?"

Dr. Larsen: I'm going to let Nikki answer that question. Dr. Wooten.

Dr. Wooten: I'm not familiar with any studies that address moral injury in terms of the treatment planning, but they do address how the behavior manifestations of PTSD may change based on some experience of moral injury. For instance, there may be more survival guilt, more self-blame in that cluster of PTSD symptoms regarding negative trauma related cognition's. So, in the sense of planning treatment, those negative cognition's may be more of a focus of the treatment plan and of the treatment strategies than the other symptom clusters.

MAJ Pittman: Thank you. Another question related to treatment, "Are you familiar with the biofeedback program? If so, how effective do you think it can be to treat PTSD and will help alcohol abuse?"

Dr. Wooten: Biofeedback has been found effective for both PTSD and addiction. It actually helps the client become more aware of the psycho-physiological responses of stress and how the body responds to that fight or flight fear response. There is research that suggests that biofeedback has been effective and typically, it's not used alone. It may be used in connection with other treatments, so it may be a compliment to CPT or CBT or some other type of treatment that may be being administrated to the patient.

Dr. Larsen: There's also emerging literature in the area of mindfulness training that's not sponsored by the DOD and the use of mindfulness training as a part of treatment for these conditions.

MAJ Pittman: Great. So, another question in regards to treatment, "Has there been any research regarding effectiveness of CPT on PTSD without any use of pharmacological anti-anxiety agents versus CPT with anti-anxiety medication?"

Dr. Wooten: Yes, there has been treatment on both CPT with psycho-pharmacology and CPT alone and both have been found effective to reduce not only PTSD symptoms but depression and anxiety symptoms. As we know, PTSD is often co-morbid with depression and anxiety so typically most studies do measure depression, as well as anxiety. However, sometimes prolonged exposure or CPT have been found to exacerbate symptoms so therapists should be aware of how their client or patient is responding to the treatment that they're providing.

MAJ Pittman: Thank you. We're going to move back and talk a little bit more about some of the research. So, someone says "I'm a home tele-health case manager with the VA. Any recent studies done on women veteran's with PTSD and substance abuse disorder?"

Dr. Larsen: I guess the question might be ... I mean, yes, there's a growing body of literature on the prevalence of PTSD and substance use among women. Not as much among military members as in the VA and there are quite a few studies in National Guard and reserve units.

Dr. Adams: For this SUPIC study, that Mary Jo mentioned earlier, we have partners at the Palo Alto VA where we are able to, because of our sponsorship with Dr. Thomas Williams at the Defense Health Agency, we've gotten support where we've been able to track the Army service members in our cohort who either separate or demobilized from the military and then chose to utilize care in a Veteran's Health Administration. We're able to look at them and what they screen positive for when they arrive in the VA and what sort of treatments they get and a lot of that work is ongoing but one of our analysis is looking at people in our cohort who screen positive for PTSD or depression or drinking problems and then how that relates to if they use care in the VHA and if they continue to have problems when they're there.

I know Megan Vanneman has a paper under review right now on that topic and that's one of the things we're interested in looking into further.

Dr. Larsen: We have another paper where ... I think it's in our references ... where we talk about screening positive on urine toxicology tests after deployment that I would refer that person to, as well.

Dr. Adams: ... and if there's a paper you can't find of ours that you'd like, feel free to reach out of one of us and we can help you get that.

MAJ Pittman: Staying with the topic of veteran's, the question is "If women veterans are less likely to utilize the VA for treatment, how do we identify and encourage treatment for those women if they aren't coming forward?"

Dr. Adams: Dr. Wooten, do you want to answer that?

Dr. Wooten: Yes, I will. There's been quite a bit of literature about, from the VA women health researchers, how to encourage women to come to the VA for treatment and what they've found is if the VA has a women's health clinic and if women can be guaranteed a same sex provider, that they're more likely to come to the VA and be satisfied with their treatment. But, what they also found is that women tend to be dual healthcare users, particularly since historically the VA has not provided gynecological and obstetrical , OB-GYN, services for women, so they tend to be dual healthcare users, using civilian providers as well as VA providers.

Dr. Larsen: Our own linkage studies where we're looking at this cohort of people who have deployed and then either demobilized or have been discharged from the military has found essentially equally rates of linkage between men and women. So, in this subgroup, we're finding equal rates, so I think it's probably a complex issue and some of it's historical so it's possible that women in the Vietnam Era have not linked women in the OIF, OEF era may be linking at a higher rate.

Dr. Wooten: ... and giving that that's approximately 10% of the women who've been a part of those that deployed, we also have to consider that perhaps some

women, when they retire, they still may not link with VA services and so that population is not captured by our research.

Dr. Larsen: Right.

MAJ Pittman: Thank you. Another question along those lines, "Are there any treatment modalities that should be focused towards women or what are those, if there are some?"

Dr. Wooten: CPT, CBT and PE have all been found effective for both men and women in military and women populations. Seeking Safety has more specifically focused on women who have co-morbid PTSD and substance use disorder however, limitation of the research on CBT, PE and CPT is that in the military and veteran population, most of the research has been conducted primarily male samples so what we know about men ... we have much more information about how effective it is for men than we do for women.

However, there is probably much more information on Seeking Safety in terms of its effectiveness for women since it was developed specifically for women who have co-morbid conditions.

MAJ Pittman: Thank you. Another question asked, "Did any of the research was it extended into domestic violence through the PTSD and/or alcohol abuse?" So, did you look into any domestic violence issues?

Dr. Larsen: I would say that that's one of the limitations of the data sources that we're using. In addition to the PDHA and the PDHRA, we are looking at claims data or encounter data, so there are some diagnosis codes that can pick up either being a perpetrator of domestic violence or being a survivor of domestic violence.

We haven't drilled down into that, and we know that those codes are not used very frequently in the health encounter data. We also know that that service that's offered, that family counseling service that's associated with domestic violence in the military is not contributing records to the data we look at so I would say it's under addressed in the study that we're doing.

MAJ Pittman: Go ahead.

Dr. Wooten: I was going to say I use to work at FAP, Family Advocacy Program, and the DOD FAP office collects that data separately from the claims data and the data that we've accessed in our research but that data is available although we're not using it.

Dr. Larsen: Thank you.

MAJ Pittman: You probably already answered this when you talked about the data, but they wanted to know is there any way to park out the assault experience

questions to include physical assault within unit, as well as sexual assault, etc?

Dr. Larsen: On this current version on the PDHA, and I don't know if this is going to be changed in the future, that one question "wounded, injured or assaulted" is actually one question and it would be nice if those elements were split out, but no, that's not possible with the PDHA version that we're looking at. For example, you could be wounded or injured even from a non-combat experiences while you're deployed. You could be in a motor crash or fall off a ladder, so we can't separate that and it's a very good question.

MAJ Pittman: Given the research from the International Traumatic Stress Studies Institute on the high rate of PTSD in military members who report childhood trauma and/or other pre-service mental health challenges and higher rates in National Guard and reservist, what measures does the military employ to assist military service members, particularly women, in developing healing treatment and coping skills for anticipated stress of pre-deployment?

Very long. Ask me if you need me to repeat any of that.

Dr. Larsen: I think, again, this would probably be a question for Dr. Wooten.

Dr. Wooten: Yeah, can you repeat the question please since there seems to be multiple parts to it?

MAJ Pittman: Yeah, so they were saying with the studies from the International Traumatic Stress Studies Institute that says that childhood trauma is a contributor. Is there any measures that the military is employing for military members, particularly women, in developing, healing, treatment and coping skills for the anticipated stress before deployment?

Dr. Wooten: There is the Deployment Risk and Resilience Inventory, which address pre-military traumatic experiences but the research has been mixed and a lot of the research recently in the past has been conducted with Vietnam veterans and more recently, they've been conducting research with women from the current wars, OEF, OIF, OND, and so they findings are mixed in terms of whether or not the adverse childhood experiences or the childhood trauma or the pre-military trauma has an impact on post-deployment posttraumatic stress symptoms.

They're finding that it's more those deployment and reintegration experiences that are more associated with post-deployment posttraumatic stress symptoms. In terms of coping, there have been a number of initiatives implemented by the Department of Defense to encourage better coping with deployment stressors prior to deployment, so for instance, they often times make military members conduct screening prior to deployment. There's also screenings that are conducted during the Soldier's Readiness Processing, the SRP, some of you may be familiar

with and they also have a pre-deployment screening instrument that taps into what are some of the stressors that they hope will help service members become more resilient to deployment stressors and reintegration stressors.

MAJ Pittman: Thank you for that very detailed answer. That was a great answer. I think we have time for just one more question. This question states "Did the research reveal any self-medication to manage chronic pain?"

Dr. Larsen: That's a really good question and it is a part of our second study. We're looking at services that offered to people who have chronic pain as well as the rate of prescribing of opioids and how long those opioids are prescribed. The question is that available to us, we don't know who's using alcohol or using drugs in order to cope with pain or cope with any of the other problems that they have. We do know there's co-morbidity, obviously, co-occurrence of pain among people who have PTSD, depression and alcohol use.

That would have to come from qualitative studies and from interviews that we don't have access to, but I suspect that we would find higher rates of drinking ... actually, we have started to look at, in our study, just some diagnosis of alcoholism among people who have chronic pain and our preliminary findings are finding that it's not associated in the way that we thought it would be associated, so we'll have to wait and see if we can tease out anymore information there.

MAJ Pittman: Thank you so much. There's still tons of questions out there. We'll make sure you get some of these questions so you can answer those. I really appreciate everyone on the line. Thank you for attending the webinar. Thank you, Dr. Larsen and Dr. Adams.

Dr. Larsen: Thank you for this opportunity. We'd love to answer any other questions or send articles to people.

MAJ Pittman: Thank you so much. For those on the line, after the webinar, please visit dcoe.cds.pesdce.com to complete the online CE evaluation and download or print a CE certificate or certificate of attendance. The online CE evaluation will be open through Thursday, November 10, 2016. Thank you again for your presentation today.

Today's presentation will be archived in the monthly webinar section of the DCoE website. To help us improve future webinars, we encourage you to complete the feedback tool that will open in a separate browser on your computer. To access the presentation and resource list for this webinar, visit the DCoE website at dcoe.mil/webinar. A downloadable audio podcast and edited transcript of the closed caption text will be posted to that link.

The chat function will remain open for an additional ten minutes after the conclusion the webinar to permit attendees to continue to network with each other.

The next DCoE TBI webinar, Advancement of Traumatic Brain Injuries Research and Clinical Care in the Department of Defense is scheduled for November 16, 2016 from 12-1:30 pm Eastern time. The next DCoE psychological health webinar, Evidence based Management of Suicide Risk, a Guideline Perspective, is scheduled for December 15, 2016 from 1-2:30 pm Eastern time.

Thank you again for attending and have a great day.

Operator: This concludes today's conference call. Thank you for participating. You may disconnect at this time.

Operator: Welcome and thank you for standing by. At this time, all participants are in the listen only mode. Today's conference is being recorded. If you have any objections, you may disconnect at this time. Now I would like to turn the meeting over to Felicia Johnson. Thank you, you may begin.

F. Johnson: Good day and thank you for joining us for the DCoE Traumatic Brain Injury October webinar, "Unique Perspective for Women with Traumatic Brain Injury: Gender Differences and Coping Strategies". My name is Felicia Johnson. I'm a neuroscience clinician in the Clinical Affairs Division providing contract support for the Defense and Veterans Brain Injury Center. I will be your moderator for today's webinar. Before we begin, let us review some webinar details. If you experience technical difficulties, please visit dcoe.mil/webinars to access webinar troubleshooting tips. Please feel free to identify yourself to other attendees via the chat box but refrain from marketing your organization or product. Today's presentation is available for download from the files pod and will be archived in the online education section of the DVBIC website.

Please note, due to data and Dr. Odette Harris' presentation not being published, her presentation slides will not be available for download. All who wish to obtain continuing education credits or certificate of attendance and who meet eligibility requirements, must complete the online CE evaluation. After the webinar, please visit dcoe.cds.pesgce.com to complete the online CE evaluation and download or print you CE certificate or certificate of attendance. The evaluation will open through Thursday, October 27, 2016. Throughout the webinar, you are welcome technical or content-related questions via the Q&A pod located on the screen. All questions will be anonymous. Please do not submit technical or content-related questions via the chat pod.

I will now move to today's webinar, Unique Perspective for Women with Traumatic Brain Injury: Gender Differences and Coping Strategies. The data regarding active duty servicewomen who have sustained a traumatic brain injury suggests their experiences, after effects, and outcomes differ from servicemen. This presentation will integrate current research and clinical expertise to advance healthcare awareness of TBI among women serving in the military. The speakers will present current evidence comparing female athletes and active duty service members with a TBI history as well as data about servicewomen with and without symptoms from co-occurring conditions such as posttraumatic stress disorder, anxiety, and chronic pain. The presenters will also address the gap in the present knowledge base concerning gender differences and TBI.

At the conclusion of the webinar, participants will be able to describe three ways in which brain injury in women including concussion and TBI are unique, articulate factors that may account for gender differences in TBI incidences, severity, and recover, apply best practices in the education of women who have TBI to facilitate recovery.

Dr. Odette Harris is the Associate Chief of Staff of Rehabilitation which includes TBI polytrauma, spinal cord injury, blind rehabilitation services, and physical medicine and rehabilitation in the Veterans Affairs Palo Alto Healthcare System. In addition, she is the Associate Professor of Neurosurgery at Stanford University and Director of Brain Injury at the Stanford University School of Medicine. She also serves as Director and principal investigator in the Defense and Veterans Brain Injury Center in the Veterans Affairs Palo Alto Healthcare System.

Ms. Katherine Snedeker is the Executive Director of PINK Concussions, a nonprofit focused on female brain injuries and concussion from sports, violence, accidents, and military service. She is a licensed clinical social worker who was inspired to go to graduate school after volunteering in the Times Square Vet Center in the early 1990s. She has presented on female brain injuries throughout the US and in Europe. She is personally acquainted with TBI as she has three sons of which two have multiple concussions. One son had post concussive syndrome. She herself has the same multiple concussions over a 30-year span and is currently a participant in the Boston University Veterans Affairs Legacy Chronic Traumatic Encephalopathy Study.

O. Harris:

Hi, good afternoon or good morning where I am. This is Odette Harris. Thank you for that introduction, I appreciate it. I am going to talk to you today about gender and the effects of polytrauma. Thank you so much for joining us. I understand that there almost a couple hundred people online so far. It's wonderful that so many people are interested in this topic and have taken the time to participate in this webinar. I'm also really grateful that I'm being partnered with Katherine Snedeker who exemplifies passion on this subject and her presentation will follow mine. Again, thank you to DCoE for inviting us and for recognizing the significance of this topic and giving us a forum and the resources in which to share our work.

Again, my name is Odette Harris. My clinical and research areas are both focused on traumatic brain injury. I am co-located at the Palo Alto VA where I am as you noted, an Associate Chief of Staff for rehabilitation with a focus on brain injury. Much of research is funded and supported through DVBIC, the Defense and Veterans Brain Injury Center. Then I'm also at Stanford where I am a neurosurgeon focusing on acute traumatic brain injury, so lots of focus on brain injury. My presentation today is focused on gender and the effects of polytrauma. I have no disclosures other than the views I am expressing today are not official policy of the US government or the Department of VA or DVBIC. No financially relevant disclosures and I don't intend to discuss any devices, products, or procedures that are off label, unlabeled, experimental, investigational, or not FDA approved.

As an overview of what we're hoping to cover today is familiarizing those of you on the line who are not familiar with the polytrauma system of care and its significance in the realm and management of traumatic brain injury and then talking specifically about gender and the effects of polytrauma and trying to touch on three issues within there that are noted on the slide.

My experience and practice is unique and I think advantageous in this realm in that I cover both the acute management of traumatic brain injury, the rehabilitation, and then all the way to re-integration and so sort of the whole spectrum and gamut of TBI. I have a perspective that is shaped by those experiences.

As we look at polytrauma, I have this picture of my version of the map of the United States in regard to our understanding of blast exposure and TBI at the time of the initial conflict. As you can see, it's a fairly blank map so very little understanding. Our general rehabilitation units were set up with specific areas of focus. When we looked at brain injury, it was very much an isolated component of our general rehabilitation unit and we focused symptom specific or disease specific diagnoses. As many of you are aware, there was a conflict whether OEF, OIF, or Operation New Dawn and as a result many individuals suffered traumatic brain injury many secondary to blasting but there were other mechanisms of injury as well. Our responsiveness or our lack of responsiveness at that time or lack of being prepared rather, was headline making. There was a lot of attention focused on what was happening to these individuals and it became coined as the invisible wound of these conflicts and then of course, the signature wound of these conflicts.

I think that it's appropriate to say that the government responded in a very swift way and a very comprehensive way and set up a whole system of care that was focused on addressing and managing these patients and it was established in a way that used all of our best resources and expertise both in rehabilitation and in traumatic brain injury. The mission and the focus became specific to restoring the physical, intellectual, psychological, psychosocial components of those who had been injured

and doing it in this systematic way through what we all the polytrauma system of care.

The term polytrauma was not new to our lexicon but what we did in the context of this was co-opt a term that had previously been used to be anybody with multiple injuries and in this context it was specifically used and applied to those who had a brain injury in the context of these conflicts with plus or minus other systemic and concomitant injuries. The key to this was that the brain injury was the defining or driving component of the rehabilitation because many had both identified and unidentified TBI.

We evolved and I hope the animation from my slide is preserved and it doesn't look like it is. We evolved from this to a situation and again, it wasn't preserved. The slide that didn't come up here is a whole constellation of networked clinics and points of contact throughout the United States, all established under the umbrella of what we call the polytrauma system of care. These range from clinics to comprehensive inpatient units and those units are as you can see, encompass and show the evolution of our previous understanding of rehabilitation units where now we have this whole constellation of offerings. We have not only our traditional comprehensive rehabilitation centers but we also recognize the need for transitional programs, the need for injury such as amputation and the need for integrating technology within our efforts in taking care of these patients.

From this, a whole body of literature arose. Again, the animation is not preserved here but if you look at the backdrop of this slide, you'll see several excerpts from literature throughout the time of the, from the inception of the polytrauma conflicts to date. You'll see that there's an incredible focus and interest in understanding what's happening to our servicemen and women who suffered these injuries. What we also now is that this body literature began shape our understanding, shape our management strategies, ultimately shape decisions regarding funding, and decisions regarding research direction. This was a very powerful thing that was happening.

From this literature, we understood some of the key demographics in terms of the percent of individuals who we thought were injured returning from deployment and how many individuals we were able to chronicle within the Defense and Veterans Brain Injury Center Comprehensive Registry. Since 2000, we have over 300, almost 352 individuals who suffered TBI. Again, it still supports the signature of the OEF/OIF/OND conflicts and those numbers are rising in terms of the percent of service members who have been injured ranging between 12-20%. We also know from the literature some of the more detailed demographics in terms of mechanisms of injury and the characterizations of injury and the categorizations of injuries as well in terms of severe, moderate, mild, and so on. There have been a lot that's been published as the previously slides have demonstrated.

What we also know or what also came to light was that 95% of those represented in the literature were male. We learned that the prevalence of TBI outcomes. We also learned its association with other comorbidities. The literature itself definitely provided a broad description of this cohort. Nonetheless, the question then became are these conclusions valid to everyone given that women represented such a small cohort in the literature and are the conclusions specifically applicable to women?

There are a lot of reasons for asking that questions and it's not necessarily gender specific. For those of you who are practicing clinicians or physicians or anyone within the realm of medicine or epidemiology, you'll understand that this is well known. In the 1940s and 1950s, there was a project that was initiated called the Framingham Heart Study. It is the longest running longitudinal study in our history. It started in 1948 with over 5,000 participants. The study was set up to basically better understand the epidemiology of cardiovascular disease. At the time, Framingham Massachusetts was selected because it was thought to be representative of the United States. It was thought to be the ideal cohort of individuals, the ideal study. We have been following these individuals since 1948. Everything we know about epidemiology and even the term risk factor was coined as a result of this study. Everything we know and a lot of our recommendations regarding antihypertensive and cardiovascular disease management comes from this particular study.

What was interesting about the Framingham study which makes it sort of the foundation for our concerns about gender in the context of polytrauma is that although everyone is familiar with the study, clinicians clear use a lot of the recommendations coming out of the study, what is interesting is about Framingham Massachusetts and the study itself is that the study was completely unrepresentative of America today and potentially America then. It is an entirely white, middle class, euro-American population. Despite its impulse to be completely universal and comprehensively capturing an entire community, the study significantly lacked diversity. There were no African-Americans, Latinos, or Asians captured in the study so very different than the America that we live in today. As a result, the recommendations that have been extracted from the Framingham study are not all necessarily applicable to the general cohort.

As an example, some antihypertensive medications that were recommended heavily from the Framingham study are not applicable to the African-American community and can in fact be detrimental and/or delay the appropriate treatment interventions. This is important because this was a very comprehensive effort with a lot of positive impact but that intent at universality was unsuccessful despite good intentions.

Since then, there have been a lot of attempts to wrong that historical overlap or that historical gap rather and as an example, there has been what's called the Jackson Heart Study which was an attempt to focus on African-Americans. Again, trying to make up for that historical lapse. Just

like anything that's published on the front page and then we put a retraction in a couple of days later, many people don't actually read those or see that and it's never cited or rarely cited and it becomes a problem.

I believe that a similar situation or I had a concern that a similar situation was occurring when we looked at traumatic brain injury specific to subpopulations, specific to gender disparities. The question was, are all the body of literature that we have come to depend to outline our understanding of TBI polytrauma and to outline and to frame our treatment algorithms and management strategies, are we going down that historical rabbit hole again and further creating a historical lapse that we look back on and say, oh my goodness why didn't we look specifically at subpopulations? Our questions were, how valid were these data sets and were there potential gender biases and given that women were such a small population, were they noise in the data sets that were being examined? We know that women represent a growing percentage of all living veterans and we also know that more and more women are experiencing combat with over a quarter of a million women deployed from records in 2013. We know that women are going to enter the VA systems at much higher rates and that they have unique structures associated with being a woman.

Again, we know that these are only going to increase in numbers over time. The percentage nationally is about 3-5%. At our institution, those numbers are about 6% and we believe that this is an issue. This concern was further supported at our institution where we tried to look at referral biases in our system and thought that there were some biases with women who were not accepted into our program. When we did further subanalyses, what we learned was that because there were such small percentages of women and we were using such naïve methodologies that in fact there were no biases that were being introduced but we were not applying the correct methodologies. This further spurred our interest and supported our need for looking more closely at the literature as it pertained to women in the context of polytrauma.

We looked at the literature and we really realized that although there's a lot of information there, the impact on women on TBI specifically, was largely unknown. We set out with some very important support for this project. The Claymon Institute for the Study of Gender Research which is the largest freestanding institution focusing on gender research and it happens to be based at Stanford University. We got the support of the VA Palo Alto Healthcare System and the DVBIC as well to further explore this topic.

Our hypothesis was just simply put that could the general polytrauma literature not reflect the specific experiences of women and that published data that we're using to drive decision making might in fact not comprehensively capture the female experience. We designed a study that captured the retrospective analysis of all the women coming through our system of care, all the patients as well to the greater cohort as well as

the gender specific cohort. We collected all of the routine data. Our outcomes that we focused on, however, were very specifically aligned to reflect what was represented in the literature. This was not a primary research project, it was a retrospective analysis. We tried to mirror apples to apples what the literature was focusing on. Specific psychiatric diagnoses, postconcussive symptoms, and neurobehavioral symptoms that were already represented.

What we found, and again I apologize that this slide is not animated and at least my view of it shows some cutoffs. What you can see is that in green education, you'll see that women, sorry. In your first column is just participants and then demographics specific to the entire OEF/OIF cohort. The next column is specific to the VA Palo Alto and it's specific to women in our cohort. The last column is looking at the statistical significance of those comparisons. You'll see that women tend to be better educated than the general cohort comprised largely of men and that is to statistical significance. You'll also see, however, depicted in red that they tend to be less likely to be working, more likely to be unemployed, and more likely to be homeless, again to statistical significance.

If you look at the next slide, you'll see a lot of red which again, it's the women with TBI compared to the general cohort. What you'll see is that women have very high frequencies of all of those psychiatric diagnoses including PTSD, depression, anxiety, substance abuse, and so on and so forth. As depicted in these numbers, the statistical significance are attributed to the column on the right. You'll also notice that the numbers for women are very high, much higher than for men. You'll see that depression for example, is incredibly high, much higher than in the male cohort. We know that to already be the case in terms of gender disparities in mental health diagnoses but what I bring to your attention is the fact that much of what we hear about TBI is with concomitant PTSD versus depression and that represents some bias in our management.

In terms of postconcussive symptoms, you'll see in red women have higher incidences of chronic pain, chronic headaches and again, this is in comparison to the general cohort. When we look at neurobehavioral symptom indices, you'll see that women have much higher somatosensory and vestibular complaints than the general cohort which is largely male.

As a summary of those results, you'll see that women are more often diagnosed with depression, PTSD, anxiety, substance abuse, and that women are more likely to report chronic pain, chronic headaches, sleep disturbances, and suffer from severe somatosensory and vestibular symptoms. The other interesting component that I draw your attention again is in terms of reintegration, back to work, back to life, back to duty women have a lower percentage of working, higher percentages of homelessness and this is despite higher achievements in education. It's kind of the converse of what we see in the male cohort.

This is something that has been a focus. The IOM report released in 2013 has called attention to the fact that this is something that is of concern that women now constitute 14% of all those deployed. These findings sort of attest to the fact that there are unique stressors for women and that we need to pay attention to this when we examine the outcomes and recommendations for gender. They also sort of underscore some of the points that I've tried to make in terms of the nuances and methodology that need to be applied when you're working with such small subsets in the population in comparison to the greater cohort.

This is just to point out that this is becoming increasing focus both to the NIH and to the European Commission that our research methodologies and our research strategies need to increasingly and now mandated include gender as a subpopulation and as a focus so that we can better understand these and not have to go back and do retrospective analyses. I call your attention to that first slide where we had just a plethora of research.

For those of you who do do research, you know that research begets research. If our research never stopped to focus on these genders, it's going to be harder and harder for us to advocate for more funding in this area and to have more foundational research to support an ongoing interest in this. It is rather important, not just now but for the future in securing and establishing research portfolios that focus on gender in this context. This is just sort of underscoring that funding is currently preserved but there is no doubt that we're going to see other cuts in funding and if we don't advocate for this, it's going to go away.

This slide is really also to say that the data that I am presenting is only a part of the pie and I'm happy to be partnered with Katherine Snedeker because she will talk much more about the sort of less quantitative and much more qualitative component of this story. We recognize that a phenomenological approach to this is quite important and as a partner to our project, we've captured the voices of women in video storytelling as well because we recognize that the data itself does not tell the full story. We also encourage anyone out there who is doing this to partner both the data with the voices of those who they are studying because I think that's an important caveat.

In summary, I think it's important to understand that this is an issue that subpopulation studying and partitioning of data is quite important. We are doing it in retrospect but thanks to the efforts of the NIH, there's much more of a drive to do this right from the onset so that these are integrated into the methodologies themselves and are prospective components of the data. We also recognize that the methodologies that we apply to the existing literature need to be evaluated on an ongoing basis because sometimes the nuances are lacking and as a result, we're not getting to the crux of the questions that we need to answer.

I think that's sort of the end of my presentation. I thank you for listening and I ask that all of you who have this interest, continue the effort because I don't want us to look back and have to write a historical lapse in that we studied this population and we have failed to capture its impact on this growing, and I think all would agree, significant subcohort of female soldiers. Thank you so much.

K. Snedeker:

Hi, Katherine Snedeker here. Thank you, Odette for that great talk. I learn all the time from Odette. I chased her down and found her about three years ago to try to get out of the sports concussion loop I was in to try and find out what was going on in the military and she's been a great asset. I want to thank the Defense Center of Excellence of Psychological Health and TBI, Odette, and everybody who contributed to this workshop today. It's just incredibly exciting to have this many people signed. I'm almost 50 next year so I'm not totally comfortable with video cam but we'll see how we go here.

My name is Katherine Snedeker. I'm a clinical social worker. I started an organization called PINK Concussions and I'm the Executive Director and the founder of PINK Concussions. I have no disclosures. The data is emerging. I'm hoping that a year from now, two years from now that this slide deck will be much more robust and filled out. If you take everything with this is emerging, this is the first time you looked at stuff.

To start out, how do we view TBI? Concussion and TBI or brain injury is long viewed through a male perspective. It's the football player, it's the warrior. We do know that TBI in general occurs about twice as often in males than it does in females. That also has an age group component. I don't have that chart up but in the age 5 to age 23 is when the males are twice as many as the females and then once you get to the 40s or the 50s, they're getting a little closer and by the time you get to 70, it's about the same range.

Why are there twice as many concussions in males as females? We have a video here to explain. This is kind of why. There is a risk taking aspect of teenage boys and young men. I didn't set this up quite right but they're going to be jumping off the roof. I went through YouTube videos and essentially for every 100 or 150 videos of boys jumping off roofs, there is one girl jumping off a roof. This is typically part of the make risky thing, in front of their peers they're going to jump off the roof. Sorry, it's taking a little long. There they go. Male risk taking. Not to say that there aren't females that take risks but they do so in so much of a higher level. I have three boys so I'm very aware of the risk taking of young men.

The riskiest sports for concussion are often male dominated. Ice hockey although there are a great number of girls that are starting to play, boxing, combat sports. Women are starting to get into football. There is actually a female tackle football league for girls out in Utah and Rugby which is having a strong call to bring women in as it expands across this country. However, in multiple studies they found that sports with similar rules, in

particular soccer, basketball, and baseball. Lacrosse wouldn't be one with similar rules because with similar rules in lacrosse, it's a different game. Men have a different set of rules than the females.

In sports, there are still more male concussions than there are female concussions. Female athletes report nearly twice as many concussions. Female athletes report a greater severity of symptoms and female athletes report a longer duration of recovery. The rate can be, depending on the sport two or three, four times that of men and then greater number of symptoms, not different symptoms than the men but maybe four or five symptoms where men will only have one or two and female athletes take twice as long to recover. In the sports world, all of this data has been known since about 2009 but the sports doctors honestly weren't acting on it and changing their clinical care for women around this. When I would talk to them, they would be like, why do we need to tell women this? Why is this important?

That's when I reached out to the military, to Odette and two other people I found, Tim Kelly the athletic trainer at West Point. His female cadets take twice as long to come back as his male cadets. You can't say a woman at West Point, a female cadet is just seeking more attention or is not strong. I see the female athletes be undercut by sort of a gender discrimination. Going to the military I was able to find the same data, the same recovery rates and yet if you compare female soldiers to male soldiers it's just a stronger connection. Despite the facts of what I call pink TBI, why don't sports academics, military, medical communities have any female specific guidelines? Return to work, return to play, return to duty. Why aren't we educating females to begin with? Why are they rarely educated about the differences which leave them ill-prepared to cope with the more severe symptoms and their unrealistic expectations of their recovery?

My story, I have three sons. Both the boy on the left and the middle child have had a number of concussions. I don't have girls but then working in two concussion clinics, I kept seeing over and over again, our female patients were taking longer to recover and had more severe symptoms. At the time, I was doing teen concussion which was used for education and I was involved with the NFL. We were doing educational programs across the northeast. I just kept seeing the female piece stick out more and more.

In 2013, I had breast cancer and suddenly couldn't work with teens, couldn't work in schools, and started this website. It originally started as defining concussions by sport, that was where I was from. By violence, domestic violence, interpersonal violence, family violence, by accidents and trauma, and military service. I think this was one of the first organizations to cross all those lines. People were like, why are mixing those all up? To me, it was about the female brain being injured, the brain doesn't care why it was injured and there's so much strength. I've been able to expand out and have been on ESPN. Various people, Chris Nowinski, various people have helped me and it has been really exciting

because we were the first nonprofit in the history of the world that we know of in female TBI.

The website started seeking and we did our first concussion conference in Georgetown and I think you'll see Odette in the picture. Where are you Odette? Odette was there speaking. We had the Deputy Army Surgeon General speak. That was at Georgetown. In the end, we had about 60 speakers over an entire day period, 29 papers, 40 posters, and close to 250 people attend. That was the first standalone meeting on female concussion as far as the history of Google says. That was pretty exciting.

The term pink TBI, I get a flack sometimes for using that but the nice thing about pink TBI it's a concise term to use on social media to educate and advocate and that covers the sports, violence, accidents, military service. If you're on Twitter or you're on Facebook and you put hashtag pink TBI, you'll bring up our conferences. We just had a conference thanks to Odette at the Palo Alto VA and we had close to 30 speakers, 29 speakers, 130 participants over two days and a number of posters. Again, a huge influx of people from the Bay area and from the west coast talking about female concussion.

What does all this mean to your female patient? You can learn all these statistics and facts but how does this help you when you go back? I mostly deal with teenagers so I use boys and girls here but you could put men and women in there. Your female patient will know more males that have had concussion than she will females just from the pure number. Any one female probably could come up with five or six males they know that got concussion but they may not know another female. That female is automatically judging her own recovery by the male experience. She also may judge the higher number of symptoms and the severe symptoms against the men or the boys that she knows. Wow, my concussion is not like theirs. She may have a longer duration of recovery. Wow, everybody else I knew is already better so there must be something wrong with me. I get calls every single week of females calling me up saying, I'm two months out, what's wrong with me? I'm three months out, what's wrong with me? Why am I not doing this right? Why am I not better?

It's just a tragedy to me that women aren't given the runway, the longer runway to say, hey it may take six months or seven months. When that recovery spans more than a few weeks and women aren't prepared for it, then you get the depression, isolation, self-doubt, anxiety. Then you start to get the work and the family questioning you that you're malingering. I had breast cancer in 2013, nobody ever said to me, are you sure you have cancer? Could that just be a lump? With brain injury and concussion, people are always questioning, how do know it's a concussion? There are a lot of jokes about it. It's just a very different experience between cancer where everybody immediately drops to one knee. What can I do for you? Can I bring you food? Concussion is not a casserole event. You don't get casseroles, you don't get help when you

have a concussion. When you have cancer, I was still going to the gym and I had piles of food in my kitchen.

This is an example and if there's one thing you take away from talk it's the couch example. Let's say that you have a couch that you love and suddenly it's ruined and you need to get a new couch. You go out and you buy a couch. The sales guy says to you, okay the couch is going to come in 7-10 days. You're really excited, you go home, and the couch doesn't come. It doesn't come for two weeks, the couch doesn't come in three weeks, four weeks. It's really a problem. Did you go to the wrong store? What's wrong with your couch? Are they lying to you? You wanted to have a party, you've got to have a couch. It's just a complete disaster.

In the same situation, if you go to buy a couch and the salesperson says it's going to take about six months, you can plan around that. You can get fold up chairs, you can go to Ikea and get pillows. You can plan to not have a party or let people know, you're going to come to my house, there isn't a couch. The difference between those two examples is expectation. I think we set women up by not explaining. The medical community has no doubt that women take longer to recover. We don't know why but they do know that that is what's happening. Again, it's setting expectations.

One of the cases that I deal with in my private practice was a sophomore with her fifth concussion. She had three concussions from volleyball, two from at home, top grades, advanced placement classes, and she returned to school after two weeks and slowly was doing half days. At week five, the mom called to say she was crying and anxious about school. She had a 504 plan and the teachers were supposed to be accommodating her. The teachers decided at one month out, she should be better. They were actually bullying her in front of the other students and saying to her, why haven't you made up the work. We can't give the test back because the other kids are waiting for you and there was no expectation on the school. That also can be seen in the workplace. It can be seen in families. Hey, you were supposed to get better in 7-10 days. It's a month out and you're still not cooking dinner or you're still not working full shifts.

Again, it's up to the woman to explain to family, employers, school why she's not better because we don't have education on how long recover takes. We do know that there's a component between age and sex. Following concussion, adolescent girls demonstrate a significantly exertional response rating a worsening of their symptoms and cognitive activity. That's significantly different between males and females. You don't see that before women have gone through puberty. After puberty, a teenager will walk into a classroom, seem fine, laughing with her friends. Then start a task, 20 minutes into the task will suddenly get a headache and ask to leave and the teacher will be judgmental saying, well yeah you were fine when you walked in, what's wrong now? That exertional response is not seen in males the way it is in females. Again, it's part of the educational process.

Why pink TBI? Dawn Comstock who is actually in the hotel with me now is presenting her data on athletes. In 2009, we knew that women concussed at a higher rate. We've been doing study after study in military and in the civilian world that they concussed at a higher rate but still the congressional committee asked do we need more money to study this? We don't need more money to study the rates, we need to do the research to figure out why. There are a couple of factors. There's neck strength versus head strength. The neck is a component a lot of people talk about and it may be a factor but if you think of football players, some of them don't even have necks. They're completely a head to a shoulder and they still get concussion.

Reporting styles is often, and I'll talk about that a little later, that women report more. Hormones is the key one I personally feel. There's some great VA data coming out of the Boston VA on the hormones. Where you are in your cycle of the month, whether you're in the first two weeks of the cycle or the second two weeks of the cycle will determine how your outcome is. Female culture test bias, are our tests set up right away that there are differences between males and females pre-injury that are going to show up post injury. Then sex versus gender.

I just want to talk about this for a quick minute, the definition of sex. Scientifically the sex may be defined as the biological differences between male and female, the genetic, the hormonal, the psychological, and the physiological. The gender is thought of as a social construct based upon interpersonal roles or personal identification not always coordinating with biological sex. I always thought of myself as a tomboy growing up and my children tell me today that that term doesn't exist anymore. It's complicated now to talk about gender but you try to use those two words separately as we move forward. The sex difference would be the neck strength versus the size of the head and the hormones. The gender would be this myth that women are more likely to report and then the female culture of seeking health care and test bias would be gender differences.

Who gets TBI and I think slides I have picked here are slight sexist but that's what was available in clip art that I could use. As you see, we have and I was using the term today shaken baby but inflicted trauma all the way through elder abuse. Let's go look at that. We have infant inflicted trauma, the old term shaken baby. Toddlers starting to walk, playground injuries, car accidents, and then you have this middle segment which may be going out you may have trauma from dating assaults, driving, living on one's own, different risk factors, playing with toddlers, back on the playground, and that's also the period of time where you meet military service. Then in the elder years, osteoporosis, getting older trips and falls, and then the final stage is living alone elder abuse. These are all different causes of TBI throughout the lifespan of a woman. What if you have a TBI as a toddler? How does that affect the rest of your development if you have a brain injury at a certain point? These are all questions we want to ask in TBI.

How does she get TBI? We just discussed this is sports, violence, other domestic interpersonal, family. There are many difference for violence, accidents. I know the CDC doesn't like that term but trauma, motor vehicles, falls, and military service which can be in combat or in barracks, not in combat. Concussions from my world we look at the NCAA numbers where you have football with the largest number but if you look women's soccer is picking up and they're seeing these rates at the NCAA level. We have contact and collision sports of which would field hockey, rugby, skiing, soccer and then contact ones where you don't mean to run into each and then limited contact ones. We have sports that we don't even consider on those like synchronized swimming. I recent study just came out that a high percentage of water polo and synchronized swimming concussions. There are the ones that we think about and the ones that we don't.

Again, another concussions in NCAA sports where women's field hockey, women's soccer, ice hockey, and lacrosse. We'll talk a little about reporting those. This is a study that I'm doing. I really encourage other people in other areas to do these kinds of studies. These are concussions reported to the school nurse. This is our third year for 11,000 students in my school district. What we found, this were our 2014-2015 year is we had 111 concussions over the 11,000 students. We broke that down to being sports and non-sports concussions. We so focus on the sports concussions in the civilian world. Those are the ones that interest us. We looked at primary school, middle school, and high school. Those numbers are interesting but they tell us deeper.

If we break it down even further, if you look at the concussions boys to girls, they look like they're sort of even but then let's go back down to the primary school boys and girls. I don't know if I have a pointer here. The bottom two numbers, if you see the total concussions between boys and girls, you have 15 for boys and 4 for girls. This happened in the second year that we did the study and now also in the third. Boys have more concussions in the primary levels and then in middle school the girls start to tick up, 14-15. That's where we start to see girls go through puberty and girls start to pick up in the sports. If you look at the high school boys to girls, 39 girl concussions to 24 boy concussions. They're really picking up at that point. Then you look up top and they look like they're kind of even but now we see that it's a different age range and that this happens over the three years that we've done this.

High school teen sport concussions, we'll look at this and say 18 males and 16 females but then we actually had 27 that were from the school nurse and then 34 the athletic trainers. The athletic trainers are starting to manage the concussions, not involving school nurses, we need to work on. If you look at this, this is really small, I have to get a little closer. Girls volleyball had four concussions, boys football had seven concussions. If you just look at those statistics, boys football we expect more but what's hidden here is out of the boys, there's 110 boys playing football right there and seven have reported concussions. Girls volleyball was close to 24

students and four reported concussions. We don't look at the number of men to women that are playing.

Cheer in California was just made a sport, it's not in Connecticut. We had two concussions. This year we had four color guard concussions, both sports not even considered. If you look at the enrollment versus the concussions in the sports, there are more boys playing sports and you divide the fewer female concussions by the fewer females playing, last year we also got a 4% increase.

Here are some statistics. I'm getting close on time so I want to make sure I go a little ahead. There's 1.6 to 3.8 million sports concussions. We don't really know. A lot of people are presenting in this conference I'm in right now at NIH and it's rough numbers, it's very rough. There's an estimated, it's sort of underneath the iceberg of these sports injuries are domestic violence. There's an estimated 3.1 million women could sustain TBIs due to domestic violence, 3 to 10 million children could be exposed to domestic violence. We do know that around half of perpetrators in intimate partner violence do also abuse the children. If you look at these statistics, what they found is 67% of women seeking medical services related to domestic violence had symptoms associated with TBI. Again, we're interested in the sports. People are patient when you talk about military service. Nobody wants to talk about the TBI numbers that are domestic violence or violence.

Because of time, I'm going to go a little ahead. In the timeline, chronic traumatic encephalopathy, CTE there are two studies out there and one I nicknamed Lucy and the other one Wilma. They were both in 1990 and one was an autistic woman and another one was a woman of domestic violence and they called her the punch drunk wife. I've spoken to one of the two authors who is still living and they pretty much believe that both cases were CTE. Those women were only studied because of other ... The punch drunk wife had cauliflower ears looking like a boxer. Lucy who was the autistic woman that died, they looked at her brain because she was autistic. They aren't looking for CTE in women yet. These just happened to be cases that those brains were passed along for other reasons and they found what we know call CTE.

PINK Concussions was started in 2013 and what we do is we create international medical summits like the one we just had at the Palo Alto VA thanks to Odette and her team out there to bring world class experts together, publicize current research, stimulate more studies, develop educational resources, share the female experience, and try to create online communities. There's a picture of the Georgetown one. The NCAA DOD is ongoing and they're in year two of their study. I think they're up to 800 female concussions but unfortunately, they aren't taking the samples of women's hormones at the time so I'm kind of frustrated about that because the time of a woman's cycle when she has a concussion is really important, not only when they're injured but also later on. If you're doing cognitive testing, you should also know what cycle she's in.

There was a briefing in 2016 in June, it was a not a hearing but a briefing in front of Congress which was really great and that was exciting for the first time to have female brain injury as its own topic on capitol hill. There's just a couple of little statistics I'm going to go through in the few minutes we have left. This is in the civilian world which matches the findings that Odette found in her presentation that women with TBI are more likely to experience social, financial, and structural barriers to the needed services. They're more likely to be affected by poverty, social isolation, lack of family support, lack of transportation, community resources. That's mirroring what's happening with female soldiers. Women with disabilities are more significantly likely to be victims of violence and abuse and regardless of disability status are more likely to be victims of interpartner violence which lead to potential TBI and often repeat injuries.

Specific guidelines, screenings, and treatments are needed for these situations. It's actually amazing to me that I've talked to a number of domestic violence clinics and they don't screen for TBI. There aren't any TBI questions. They have other safety interests. There's only so much they can do in that initial interview but that TBI thing that's really important. If that situation where a woman with a TBI is then put in front of a judge and she's confused, has the issues that you would see in an athlete after they have a concussion, she won't make a reliable witness for herself. I think that's really important for domestic violence to have a bead on that. They're less likely to return to work, less likely to receive vocational rehab, significantly lower rates of returning to work, need for feminine role in child rearing and household management to be part of rehab goals. Again, mirroring the study Odette talked about. Less sexual and reproductive health, higher rates of menstrual and endocrine dysfunction. Again, a huge part of the menstrual cycle. Fatigue, cognitive functional difficulties representing strong obstacles. Again, mirroring the other study.

I'm just going to do my study really quickly. What I wanted to look at was this, oh women just report more. If you look in the literature, it goes back to cardiac studies where it says women are more articulate about their pain and I would agree that women are probably more articulate about their pain. Just because we're more articulate doesn't mean more of us are reporting. This study we call No Guts, No Glory but this is a picture of a student athlete who has got sort of like tampon-like things in her nose to stop the bleeding. She has an ice pack on and I know her and she was asking to go back in the game if they could clean up the blood.

This was a representation of that women don't just, you know. Women are expected to get back in the game. This was looking at the ... We know about concussion from the media reports but there weren't a lot of reports looking at [inaudible 00:58:52]. We wanted to know why do athletes continue to play after concussive syndrome. Do they hide their concussions less than males and why do they hide? This is a problem

which we had already talked about that female athletes receive nearly twice as many concussions as males and more severe symptoms.

Our study we used snowball sampling. We used social media, Twitter, Facebook, Instagram, 40 questions. What was really amazing that in one month I had 800 women write me and of those 800 women that wrote, I think we probably approved 600 and of those 600, 529 finished the entire 40-question questionnaire. It took me a lot longer to get the males but in the end we had over 800 and they answered online questions about their athletic experiences. Again, this is them reporting their experience. The average age of the women at the time of the incident was 19 1/2 years in a variety of sports. It had to be a sport and it had to be a concussion that they had.

The average was four concussions diagnosed by an athletic trainer which is actually pretty amazing because a lot of females don't even have athletic trainers there, especially not at the volleyball game. The athletic trainer is more likely to be at the football game. Six concussions included adding the hidden concussions they didn't report. At the time of the survey, they were 29 or 30 years old. It's a different realm, I'd really like to do this study again with the under 18. Two concussions outside of sports. 47% of the female athletes continued to concuss outside of sports. I have to go closer because this is a little small. What the statistics showed is that suffering more concussions playing sports diagnosed by a physician was pretty close, 84% of females, 80% of the males. Have you suffered any other head injuries, things you wouldn't call a concussion because maybe the definition. That was pretty close.

Suffered a concussion but continued to play without recording. This is the meat of the study for me. Yes, women reported, 70% of the women hid a concussion, 79% of the men. Yes we were a little more honest but still we had 70% of our athletes and higher hiding concussions. Yes, we did report a little more but the entire group is hiding concussions. We hope this statistic doesn't exist in the youth of today is that 33-36% of men and women went back after reporting concussion. Hopefully, we're beyond that point. Did you suffer any serious head injuries other than organized sports. For females 47% and for males 36%. The women were significantly higher in continuing to concuss. They also felt that they were experiencing signs of memory loss. It was a more of a concern for them than it was for the men.

This is recurring symptoms. This follows basically every study that shows that headache is number one. Then slow thinking and then other and foginess and women feel it more intensely than men. That would follow the other studies. This is the part that I actually thought was exciting and this needs to be done at the military level, domestic violence, all the different groups is why did you not report? We had a 95% level of significance that these percentages were accurate. For the women, it was a lack of awareness. They didn't know what a concussion was. Then it was they wanted to keep playing. Then it was a lack of resources. For the

men, start from the bottom up. It was the allegiance to the team, leave no brother behind. Then, I know it was a concussion but it wasn't severe and then down to a lack of resources. The men and the women had very different reasons for hiding their concussion.

Why is that important? Because if you're trying to educate them, the women you have to design concussion education around gender. The female athlete needs to create awareness of what concussion is, increase the resources of having people, athletic trainers and coaches be aware of it and then wanting to keep playing. For the male, it's what's best for the team. If you're out there playing with a concussion, you're letting your band of brothers down and explain the severity of concussion. Again, this would change how we're teaching about concussion. Teaching communication skills, how to advocate for one's health, how to report early signs, and how to report [inaudible 01:03:23]. That will happen also in the military population. I want to stay out with my patrol, my platoon, I don't want to go back to base. If you're putting people in danger because you're going to make mistakes ... In the end, all athletes need acceptable, trustable, proper medical care and we need to educate, advocate, and support females with TBI.

There's my contact information. I just want to thank Odette again for the Palo Alto conference we just had last week. Our future event is going to be at NIH next year March 2 and 3. Thank you all for your attention and I hope some of the stuff that we're looking at in athletes and teenagers gives us some suggestions about education and how we could apply that to women in the military.

F. Johnson:

Thank you Dr. Harris and Ms. Snedeker for your presentation. If you have any questions for our presenters, please submit them now via the Q&A pod located on the screen. As we await for the arrival of the questions, I would like to tell you about an article published in the July 1, 2016 e-publication of the Journal of Neurotrauma entitled, Female Service Members and Symptom Reporting Following Combat and Noncombat-Related Mild Traumatic Brain Injury. A team of researchers at the DVBIC undertook a clinical study to address the concerns that females are often excluded from military-related TBI research because of their relatively low prevalence in this population. The goal of this study was to focus on outcomes from mild TBI in female service members compared with males. Participants were 172 US service members selected from a large sample that had sustained a mild TBI and were evaluated within 24 months of the injury at one of the six military medical centers. 86 women were matched with 86 men on nine key variables, TBI severity, mechanism of injury, bodily injury severity, days post injury, age, number of deployments, theater where wounded, branch of service and length.

Participants completed the neurobehavioral symptom inventory and the posttraumatic stress disorder checklist. There were no meaningful gender differences across all demographics and injury-related variables. There were significant differences between the two groups on the

neurobehavioral symptom inventory total score and all four neurobehavioral symptom inventory cluster scores. Symptoms reported that were most effected related to nausea, sensitivity to light, change in taste or smell, change in appetite, fatigue, and poor sleep. There were significant differences between the two groups for the posttraumatic stress disorder checklist total score and two of the three posttraumatic stress disorder checklist cluster scores. Symptoms most effected were related to poor concentration, trouble remembering a stressful event, and disturbing memories, thoughts, and images. Females consistently experienced more symptoms than males. In sum, self-report postconcussion and PTSD symptoms were significantly influenced by gender although this effect was most prominent for postconcussion symptoms.

It is possible that gender differences in the military setting may be associated with one, additional interpersonal stressors faced by female service members during deployment such as physical assault, sexual assault, sexual harassment, gender harassment, and victimization. Two, the tendency for female services to more likely have a history of pre-military trauma such as childhood physical or sexual abuse or intimate partner violence. Three, other unknown factors related to mild TBI. Nevertheless, as females become more active in combat-related deployment, it is critical that future studies place more emphasis on the important military population and prepare for the growing TBI-related healthcare needs among female service members and veterans.

Portions of this data were presented at the International Brain Injury Association annual conference in San Francisco in March 2014. The views, opinions, and/or findings obtained in this articles are those of the authors and should not be construed as an official Department of Defense position, policy, or decision unless so designated by another official documentation. Inquiries should be addressed to the study team's POE, Dr. Tracy Porkel at tporkel@DVBIC.org. Please allow up to five business days for a reply in the event case consultation with the larger study team is required. This article description and full reference information can be downloaded now from the pod on the left hand side of your screen.

It is now time to answer questions from the audience. If you have not already done so, you may submit questions now via the question pod located on the screen. We will respond to as many questions as time permits. First question, what did you mean when you said that the time of the menstrual cycle can indicate recover? Do you mean at what point you are in?

K. Snedeker: Could you give me the question one more time?

F. Johnson: Just a second. I'm going to go to another question. What did you mean when you said that in time in a menstrual cycle can indicate recovery? Do you mean at what point you are in the cycle when the injury occurred?

K. Snedeker: Jess Bazarian from Rochester has done this work right now along with another. It's when the progesterone level is high and then there is a TBI, the progesterone level drops off and it is that drop from being at a high level to a low level that was thought to cause the core outcome and the longer outcomes in women. Women on birth control who have a straight level of progesterone because they're taking it in a pill form, don't have that fall off. You have to very careful saying birth control is a protective but they don't see the outcomes with women on birth control in that study that they did. Again, it's an issue of progesterone. After TBI, a number of women have cycle that are thrown off after that. All of this connects with the hormone piece. Again, we need to study it more. There's some great work by Ann Rasmusen up at the VA in Boston and there's also a whole other webinar on the connection between PTSD and TBI and hormones. It's what level you are and where you're injured and then how your body responds to that afterwards. Honestly, I think that that is the piece. If we can crack the code there, we can apply those findings to men and actually help men.

F. Johnson: Okay, our next questions is, is recover time data available on pink concussions based on development ranges throughout the lifespan?

K. Snedeker: Great study, love to know that. We do know that once a woman goes through puberty and during her, I think the term is, childbearing years have the longer recoveries. After menopause, there is a very small study but it looks like it isn't different. I tell you one of the dangers though in that after menopause senior years is a lot of times when women fall with a TBI and they have a hip injury at the same time, they'll be written up as senile or early dementia when it's really a TBI and not be given TBI rehabilitation but then start down the path of early Alzheimer's. We need to educate the doctors looking at seniors as well. There's just different risk factors at all different ages based on the age of the female.

F. Johnson: The next question. Given that TBI can often be misdiagnosed would either of you put the likely rate of TBI at a higher number than 12-20%?

O. Harris: This is Odette Harris. I suppose from the question that you're referring to the published literature that says that the range of those returning from deployment is 12-20% and so I'll answer it in that context. I think the range could definitely be higher. I think one of the things to understand from the context of the military and how the VA has handled TBI and TBI diagnosis and then subsequent placement in the polytrauma system of care and then management is that we have erred on the side of sensitivity over specificity. In an attempt to make sure that the capture is as comprehensive as possible, the questions and frameworks for diagnosing have been tailored to that.

For example, the idea is that we would rather throw a wide net and catch individuals for which there is uncertainty about the diagnosis of TBI than narrow that net and be certain that they have that diagnosis but miss other individuals for which the tools that we're using might not be

sensitive enough. That's a long way to answer your question in saying that I believe that that range is as good as we could possibly get in that cohort but nobody is arguing that it is perfect. Again, higher sensitivity, lower specificity with an attempt to not exclude anyone but a true understanding that it is not a perfect number.

K. Snedeker: Katherine here. I agree so strongly with Odette that you have to have a wide net. I'm currently at the NIH Pediatric Workshop where there are 60 experts sitting around talking about that there are 40 definitions of concussion. We almost have a different definition of concussion for every member at this workshop. We don't have one perfect scale. We don't have one perfect test. It's a mixture of clinical. It's a mixture of tests. It's a very wide number of tools in your toolbox. Again, I always make sure I bring a migraine specialist to my conferences to talk about the fact that as women age, migraines increase in female population. Barring you have not had a brain injury, a knock to the head, a knock to body, not all headaches are representation of concussion but if you have a blow of some type and then you have concussion resulting, it's better to treat it as a concussion and get that care than wait three months and then find out it's concussion, so wide net.

F. Johnson: The role of hormones was mentioned. Can you say more about the potential role of hormones in the development of TBI? Has research been conducted in this area?

K. Snedeker: Yes there has. Jess Bazarian on our website, PINK Concussions, we have a couple of the studies up. I'm putting some more up. I can refer if anybody wants to write to me, katherine@pinkconcussion I can refer you to a number of different studies that again, are finding these differences. We still haven't teased it out in large enough samples but we do know that it exists. Again, it doesn't surprise us. You look at other sports injuries, the triad, the ACL injuries, I can't say the word where you lose your period when you are an athlete and you exercise too much, whatever that word is, I can't say it. Female athletes have hormonal issues with the whole triad component.

Putting TBI in that is just more of the same and the awareness of gynecologists and the issues of putting women on hormones for birth control and how that affects risk of TBI, risk of depression, and risk of recovery. It's all areas that we need to expand. That's one of my biggest funding desires is we have money to put into this. I think that's the real difference men and women. If we can find it in the women, we can apply what we know to the men and help them too.

F. Johnson: Are there any plans for intensive outpatient programs like the NICO for just female patients that have suffered TBI with comorbidity conditions.

O. Harris: This is Odette and I'll also let Katherine answer as well. There are no plans that we know of but I think that this is becoming an increasing focus and I can absolutely see our developing something like that, particularly in

the transitional setting. I think on the outpatient, there might be clinics focused and I'll defer to Katherine. In terms of the NICO format, inpatient research, etc., I am not aware of any that exist at the moment but absolutely a brilliant idea and hopefully that will be something we can work toward.

K. Snedeker: Katherine here. I have been contacted by a group that I met at the VA brain trust in Washington last April where we did hackathons around TBI and they're wanting to put a female unit in. Again, we talk about fight or flight as a response. If you look at the research, fight or flight is a male response in general. Again, I probably have more male characteristics than female. I just started wearing pink when I started PINK Concussions. I think I'm more of a male type of person but the fight or flight is a male theory of how you deal with stress. Women congregate and bond. There is the sewing circle. If you're out in the fields and something attacks you, women binding together.

These concussions, brain injuries really divides women up and isolates them. Very simply, when a teenager or a parent calls me about a depressed girl who is home with a TBI, the first thing I do is invite her to be an intern. I have to tell you, you bring women together and that's why I think it's so brilliant about the workshop that Odette was talking about. You bring women together and they share their stories. I had interns Odette met last week. They get together and it's like a sisterhood they've never known.

I think of clinicians if you have a couple of women with concussions, get them together, let them share their experiences, know that they're not alone, that they're not isolated. Again, that community is so strengthening from dealing with depression, from dealing with isolation, education and get them involved in some project. That to me has been the miracle cure if there's one out there, is that community of women can be so strong and so supportive. I'd really like to see more women groups pull together whether in the clinic or in advocacy to have that foundation where women can find support from one another.

F. Johnson: Even though we know the recovery is longer, what are the rehab differences and treatment modalities for women?

K. Snedeker: Currently, there aren't any. I've talked to some really excellent doctors who I say, well how do you manage women differently? The response is, one of the popular ones is that every concussion is like a snowflake, they're all individual. Everyone gets individual treatment. There's no reason for an overall female protocol versus male protocol. I really disagree with that. Again, I think if a torn ACL of a man took four times as long as a woman's torn ACL, the men would be told. You get into the gender of most of the men, the sports doctors are men. I don't know where it comes from but there's a patronizing tone in there that women don't need to know these differences, that women don't need to be

educated. I think you're a lot stronger when you know. It might be six months, it might be two months, it sure ain't going to be 7-10 days.

That's where this longer recovery is just if women are educated. If you're telling your boss, I have a concussion, it could be six months, I've to pace myself. Again, I think if you're forewarned, a lot of these issues like with that couch example, a lot of these issues can be dealt with with a social worker, a nurse working with the patient. Again, that's why I feel so strongly about patient advocacy. Literally, that's what I've done with hundreds of families is just give them a little more information. Doctors have a tight schedule, you have 8-12 minutes to see a client. You can't find out all about their life and how to apply this. That's where I really think the social worker component, the person that has more time to spend with the patient and work out some of these difficulties.

O. Harris: This is Odette. I agree with Katherine entirely. I think that's sort of the point of much of our work is that the treatments that are available are not tailored gender specifically and yet we tailor them per patient but that aggregate information that we're using to guide our management strategies now don't reflect that experience.

K. Snedeker: I totally agree with that. We don't know are women taking longer because women's brains take longer to heal or are they talking longer because we're not giving them the right management strategies. I was talking to Bennett Amalu about this who was represented by Will Smith in the movie concussion and I asked him how many female brains he had looked at and he said, none. I was talking about this issue and he said well maybe women's brains take longer to heal because they're healing more efficiently. Maybe you guys are just doing a better job of it.

It was Bennett's off the cuff response but I kind of like that one. In the end, if we find out that we are doing a better job, it's slower but in the end we have a better product going forward that our brains are better healed, if the answers come out that we're superior, I have no problem with that. It's just that I know that we're different. It's the cohort that falls out in general is gender and we really need to look at that along with age, socioeconomic status. I haven't seen particularly any data on race yet but that may just be because we haven't done the research.

O. Harris: Agree.

F. Johnson: At this time, I'd like to thank our presenters for their wonderful presentation. This presentation has provided us with information on gender differences and asks the question, where do we go from here with research regarding females with TBI and comorbidities? What is the impact of TBI in women and how do we make sure women have a full recovery?

After the webinar, please visit dcoe.cds.pesgce.com to complete the online CE evaluation and download or print your CE certificate or

certificate of attendance. The online CE evaluation will be open through Thursday, October 27, 2016. To help us improve further webinars, we encourage you to complete the feedback tool that will open in a separate browser on our computer. You may download today's presentation from the files pod on the screen or at the DVBIC website, dvbic.dcoe.mil/education. An audio recording and edited transcript of the closed captioning will be posted to the link in approximately one week.

Please note, due to the data in Dr. Odette Harris' presentation not being published, her presentation slides will not be available for download. The chat function will remain open for an additional ten minutes after the conclusion of the webinar to permit attendees to continue to network with each other. The next DCoE TBI webinar, Review of Advances in TBI and Traumatic Brain Injury research is scheduled for November 16, 2016 from 12:00 to 1:30 pm eastern time. Please note the change in time for this webinar only. The next DCoE Psychological Health Webinar, Post-deployment Gender Differences in PTSD and Unhealthy Drinking is scheduled for October 27, 2016 from 1:00 to 2:30 pm eastern time. Thank you again for your attendance. Have a great day.

Operator: This concludes today's conference call. Thank you for participating. You may disconnect at this time.