

PTSD 101

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COURSE TRANSCRIPT FOR:

Combat Stress Injuries

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Slide 1: Combat Stress Injuries

Hello. My name is Bill Nash. I'm a Navy psychiatrist with twenty-eight years of active duty service. And for the past six years I've been working directly and solely with the United States Marine Corps including deploying to Iraq with the 1st Marine Division in 2004-2005.

This course titled, "Combat Stress Injuries", is a distillation of some of the experience gained by Marine leaders and Navy mental health providers and chaplains in the prevention, identification, and management of stress injuries over the past three years. The goal of this course is to go over a very important discrimination and provide a model for making the important discrimination between what our normal adaptive responses are to stress and those that maybe symptomatic of something more serious, what we call stress injuries. This is a crucial distinction to make and a crucial distinction to teach to war fighters and military leaders because it is the one that helps them make the all important decision of who may need additional help and who may need some additional intervention before continuing in their duties.

Slide 2: Operational Deployment Affects Everyone

Our model for making this important distinction between normal adaptations to stress and stress injuries is based on a few assumptions that have been born out by our experience in operational theatres and post-deployment. The first assumption is that everyone who's deployed to a combat zone is affected by that experience mentally and physically. Shortly we'll go over what some of the individual stressors are and you'll realize that the experience of being in a combat zone even if one is not a trigger puller, even if one does not experience mortal danger day to day, is one that has huge impact in many ways on everyone. But not everyone is damaged by these stressors. In fact some people, we don't know how many but possibly many, are affected in positive growth-enhancing ways.

Some people find new meaning, stronger spiritual connection or a deeper belief in God. But others of course, are injured by their experience, superficially or deeply. Now the kind of injury that we're focusing on here is a stress injury, an injury to the mind and brain. But it shouldn't be surprising that those maybe fairly common in an operational environment just as physical injuries are very common. Soldiers and Marines in Iraq right now are daily experiencing a host of physical minor injuries, things from blisters to bruises to cuts, to scrapes, twisted ankles, and they play hurt just like athletes play hurt. Well many of them play hurt mentally and emotionally too but most of these heal up over time and that's why most of these do not require any

professional help, require any time out from their duties. But some of them don't heal. Some of them persist after the deployment has ended. So the crucial job for us here is to try to figure out somehow to discriminate those that are at risk for ongoing symptoms.

Slide 3: The Challenge of Operational Management in the Military and VA

And so that's the challenge, discriminating between the normal adaptive responses and those that are stress injuries, being able to identify those pathological reactions, injuries early but without adding the insult of stigma and labeling to the injury caused by their stress and trauma. And then the third piece of that challenge is being able to treat these things effectively but without promoting disability. These are the challenges for military leaders, for medical and mental health professionals supporting the military. And these are the same challenges the VA faces everyday with this population.

Slide 4: Most Operational Stress Systems are Transient

Before actually launching into how we make distinction, or try to, between normal adaptive responses and stress injuries I have two introductory points I want to make. And the first one is that even though do not yet have prospective longitudinal epidemiologic data to really be able to say how common stress symptoms are in theatre, or what percentage of those actually get better or resolve over time, we have strong anecdotal reasons for believing that the normal modal outcome for stress symptoms in theatre is recovery. And we also believe that in some populations significant stress symptoms can be very common.

Now the left two bars on this slide pertain to two infantry companies in a Marine infantry battalion that was stationed in a very nasty urban area in the Al-Anbār province of Iraq. And two companies is roughly about three hundred Marines, a little bit more. In the first bar you see that fifty percent of the Marines in those two companies, so about a hundred and fifty of those three hundred Marines, screened positive using a standard validated instrument of PTSD symptoms immediately prior to their return to the United States.

This was part of the post-deployment health assessment process and they answered, fifty percent answered, three or more out of four questions on that screen for PTSD symptoms. And I happened to be there and this is why I'm relaying this anecdotal experience. I was with them and I evaluated those Marines and found that twenty percent of the total, or about sixty Marines, actually fully met criteria for PTSD--- including chronicity, including severity--- and initiated treatment with many of them.

This was one month after I got there in August of 2004. They came back in September. I followed up with them after I returned six months later, visited the battalion and talked to the leadership, talked to the medical officers who provided the ongoing care and referral to specialists to manage these Marines, and found out that the vast majority of them did very well--recovered. Many of them remained on active duty and as Infantrymen or doing other duties. Some got out under normal circumstances. And only four out of the whole battalion, which is the whole battalion is like eight or nine hundred Marines, only four received a medical discharge

for PTSD. Another three received medical discharges for other reasons and had PTSD as a secondary diagnosis. So that's a significantly small number.

Now of course one can say that the ones that were medically discharged may be an underestimation of how many were really continuing to have problems. But if you look at how many in the last bar in this slide, how many Marine veterans of OIF who are discharged Marine Corps and so far at least have been evaluated by the VA and given mental health diagnoses, it's a pretty small number. This is not any more talking about this one particular battalion but all of the nearly sixty thousand Marines who served in OIF and released from the Marine Corps-- less than ten percent have received a mental health diagnosis and only about five percent have been given a diagnosis of PTSD.

Slide 5: Combat/Operational Stress Trajectories Over Time

This is a graphic representation of the possible trajectories of stress disorders such as PTSD over time. Now this is a busy slide I know. I'll go through this briefly. These different courses, trajectories, these are not based on data. This is a theoretic, this is a hypothesis of the different possible trajectories over time. This slide, actually this graphic comes from a research proposal that is currently under review to do a longitudinal prospective study to evaluate whether these are, in fact, the possible trajectories of stress symptoms over time and what are the prevalence, relative prevalence of these different trajectories.

I'll go through them quickly. The top two chronic and delayed course are the two that probably have been most familiar to the VA over the years. Especially since most Vietnam veterans did not begin getting treatment for PTSD for many, many years after the war ended. By then they were all either chronic or delayed and onset. But there are reasons to think that those are not definitely the only outcomes nor even the most common. These Marines I described in those two companies that were heavily engaged in an urban area in Iraq, most of them had a recovery course. They clearly had significant symptoms while they were deployed and immediately prior to their return. But over the next six months they experienced resolution of those symptoms to the point they no longer met criteria to the point they were no longer disabled and many, most of them no longer even needed treatment.

There's another course that is very little studied but reported by many individuals and that's a positive outcome of growth course where individuals might experience significant stress, perhaps even traumatic stress and then not only get back to baseline, but actually beyond baseline--- improved, more mature, older, more resilient. And that's more than a hypothetical thing. That is the basis to some extent for training, for education, for life experiences of all kinds. You know the old saying, "whatever doesn't kill you makes you stronger". And we believe that that is a significant outcome from many of these war fighters.

And then the last two courses are: the inoculation course where exposure to stress of deployment actually makes a person more resilient and as they're more resilient they actually do better, have fewer symptoms. And then the last one, the blue line is, those lucky resilient guys, men and women, who managed to go through hell and back and without, losing a minute of sleep---

without symptoms in the long run. And the military certainly selects for resiliency and it selects out during the course of training--- if its good training, it selects out many of those that are not.

Slide 6: Stigma Prevents Some Service Members from Getting Needed Help

The second point I want to make in this sort of lead up is the issue of stigma. And I want to spend a little time talking about this because everyone, anyone who's involved in the evaluation and care of military members who have experienced stress injuries or stress disorders like PTSD must understand something about the culture of the military, culture in which that individual experienced those stressors, and how they perceive not only themselves but their responses to those stressors. These data on this slide are from Charles Hoge and colleagues at Walter Reed Army Institute, a research study published in New England Journal of Medicine 2004. This study involved surveying several battalions of Army soldiers and two battalions of Marines three to four months after they returned from OEF or OIF-1. And this study is one of the most widely quoted epidemiologic research projects having to do with the OIF era veterans. And the seventeen percent figure is one that is in the press constantly. They found roughly seventeen percent of all of these soldiers and Marines had significant symptoms of PTSD, depression or anxiety based on self-report.

This is the point I'm making here. Eighty-six percent of those who had symptoms realized it. They said yeah I know I have a problem. But only forty-five percent said they wanted help, less than half. Probably even more significantly less than a third, twenty-nine percent admitted to having received any help at all in the past year. They also asked why. They asked these soldiers and Marines if you haven't asked for help or are not going to ask for help why not? And as you see these are in order of prevalence. Sixty-five percent said I'd be seen as weak. Sixty-three said my leaders might treat me differently. My unit might have less confidence in me was the next one. Couldn't take time off of work. My leaders would blame me or would harm my career. You know issues of perhaps not trusting mental health or medical providers not believing in, believing that these are even treatable conditions. All of these down the list as less important, less of an obstacle. So the biggest obstacles have to do with how they would perceive themselves and how they expect others would perceive them if they came forward and said I'm having stress symptoms.

Slide 7: Greek Warrior Ideal: *Arete*

I think, and I think there's good reason to believe that the underpinning, the foundation for this kind of stigma, this kind of perception of the meaning of stress symptoms arises from the ancient Greek ideal of the aristocrat warrior that is embodied in the Greek word *arête*. *Arête* is embodied in this picture of Brad Pitt playing Achilles in the movie Troy. Everything that was written and I'm certainly no Greek scholar but everything that has been written about what this ideal embodies includes strength and valor and courage, but also fortitude. Fortitude means having the ability to withstand any stress for however long without flinching, without failing, without faltering. This is what a Greek hero, warrior was expected to live up to. And although there aren't any Greek heroes like Achilles in our current modern day militaries these values and these attitudes have continued unchanged in the militaries of the world, particularly the elite military

communities. It's identifiable in the knighthood of the Middle Ages and the Samurai in the ancient Japan, but also even in the enlisted and officer leadership cultures in modern militaries.

This ideal is what draws the all volunteer forces, that draws individuals to enlist in the military because they want to be part of this. They want to test themselves against this standard. But one consequence of this is that it implies that perhaps to even have symptoms of stress is to fail to live up to this arête ideal because to have symptoms, to falter, to be troubled, to be unable to continue to fight function even under overwhelming stress is possibly to see one's self as not having the kind of fortitude and inner strength that is expected of this kind of hero.

Slide 8: Shame over loss of Honor and Failure to live up to the Warrior Ideal

And just to illustrate possible consequences for the individual of perceiving himself or herself as not living up to that ideal. I just want to relay the story of Ajax as told by Sophocles. You know in the aftermath of the Trojan War after Achilles was killed Odysseus and Ajax both worked to bring Achilles' body out of Troy and very valorously both heroes of the Greek army. And both expected and wanted to be honored by the king through the gift of being given Achilles' armor. The king decided to give the armor to Odysseus so Ajax was, was perhaps humiliated. He certainly was let down and kind of went into a little bit of a depression. And according to Sophocles the way he described this, of course this is all myth but it embodies some, some truths about how people functioned in the military back then. He went to sleep and when he awoke he was described as having an altered mental state that nowadays we would call a dissociation. We can call it a stress injury. But when he awoke he was mad and slaughtered a whole flock of sheep thinking in his crazed state that they were Trojan warriors. Then he snapped out of this Dissociative thing, realized what he had done, and was so ashamed of his loss of control and his loss of mental reasoning and sharpness that he became depressed and ultimately stuck his sword hilt in the ground and threw himself on his sword and committed suicide.

And the words here on the slide from Sophocles really tell the story. It says, "In the past you sent him forth mighty in his valiant strength but now he suffers lonely thoughts. He has found deep mourning for his friends. And the deeds of greatest valor done earlier by his hands have been let drop," as if this failure to continue to be the valorous strong person he was, as if everything was for naught and he's no longer a hero in the eyes of the Greek army.

Slide 9: The Warrior Ideal and Identity Must Always Be Respected

So the point of all of this is that for all of us who are in the business of evaluating, treating stress symptoms, stress injuries it is crucial to understand what the meaning of having these symptoms to the individual war fighter or veteran and in the process of treating them to help them to preserve their honor rather than encouraging them to abandon it. It does not work for those of us who have never been in the military and never been deployed to an operational environment to say to someone who blames himself for not doing some superhuman heroic thing to save their bodies in combat, it would never work for us to say well you did the best you could, you know give, cut yourself some slack. Because cutting yourself slack is not necessarily what they're about. That's a mourning process for all of them to accept their own humanity but that has to be done with the sensitivity to their identity, who they see themselves as being.

It's important to use language that minimizes shame without trivializing these disabling problems. One of the difficulties we've experienced in the Marine Corps with the typical description of stress problems as being a normal reaction to an abnormal event is that you know that's great for normalizing and for helping people heal from the more minor injuries but what about those soldiers or Marines who after being told this is a normal reaction don't heal and continue to have symptoms? It's as if you had a group of Marines blown out of the back of a seven ton truck by an IED blast and they're all limping around and bruised and bleeding and you tell them all well this is a normal reaction to being blown up. And for those who heal up on their own great they do fine. They get back to work. What about those who have fractures or internal injuries? Now without assessing the depth of those injuries we may just be raising the barriers to care, increasing the stigma of admitting to having these symptoms. So that's one of the reasons that the Marine Corps has taken the approach of seeing stress reactions as either normal or reversible or potentially irreversible but often self-limiting stress injuries. And stress injuries are like physical injuries for an athlete. These are part of the cost of doing business and they're never the sole fault of the individual.

Slide 10: Some of the “Manageable” Hardships of Operational Deployment

Okay I want to shift gears here and begin talking a little bit about the normal process of adaptation to operational stressors. This slide lists just a few of the many stressors, sources of stress, and operational deployment, physical environmental things like you know heat, cold, dehydration, sleep deprivation, huge contributor to stress injuries during deployments. Cognitive, alternating between being bored to death or scared out of your mind between being bored and hyper-focused. You know Marines and soldiers who are in outposts and on guard duty, you know they are, they know any second they may be attacked from you know any direction and they have to be focused in a tent for sometimes hours and hours and hours.

Fear, most, most warriors don't actually feel afraid most of the time and we're going to talk a little bit about how and why that is. But there is, besides the underlying fear that maybe unconscious of death of injury of being captured and beheaded on television or something like that there's another kind of fear that may in some ways be more serious than the fear of death or injury and that's the fear of failure. The loyalty that war fighters have for each other, the degree of responsibility they have for each other, the loyalty they have for their organization is often more important to them than their own life and safety. So for them to feel like in the end that they have failed themselves, failed their honor, failed their brothers may as we'll talk about shortly lead to stress injuries in and of itself.

And there are social stressors, obviously being away from loved ones and friends, being like mutts in a litter, never more than a few feet away from people that can get on your nerves.

And then many spiritual challenges too. Certainly these typically nineteen, twenty year old boys and girls are deployed to experience some of the worst most horrible aspects of life and are touched with what some have called the imprint of death in a way that just shatters innocence.

Slide 11: Some of the “Manageable” Hardships of Homecoming

Then when these war fighters come home they face a whole new set of challenges and stressors. We take away their weapons. We take away their armor plated flack jackets and Kevlar helmets. And we take them away from their buddies and leaders, the people who made them feel safe for the past seven months or a year, however long, and then we send them back to their families.

We send them back to their cities to deal with traffic and crowds and drugs and alcohol. And, and we don't want them to be any different. Family members are happy to have them back but you know they want, they want back the person they sent to war. They, they don't want to see any evidence of change or damage or maybe even growth because they want that person back. That's a very difficult challenge for war fighters coming back to know how much to tell anyone, you know. And to somehow overcome that barrier of you live in a different world now having experienced what they've experienced. And if they don't trust that their spouses and parents and siblings and friends can tolerate this information and understand it and listen then they may feel alienated for a long time.

Then the thing that they maybe most need after coming back from deployment to help them heal and to feel safe is to spend time with their friends and their peers, their buddies from the unit but family members and friends back home they may not understand that. They may not want that. And of course reservists and guardsmen have a greater challenge because they, they come back and they demobilize and they disperse back to their families and hometowns and, and don't even get a chance to put the uniform on and see their combat buddies again for several months.

Slide 12: Three Tactics for Normal, Reversible Adaptation to Stress

So how do people adapt normally to these challenges both during deployment, after deployment. Well there are probably three main tactics for adaptation, both biologically, psychologically, and socially.

The first tactic, the one that we probably most normally associate with adaptation is to accommodate yourself, to change yourself physically, mentally to better suite the stressor. Now that's what training does. That's what education does. And to the extent you can change yourself to better suite the situation and the challenge that makes you more tolerant to it and makes it less of a challenge.

The second tactic is not to change yourself so much but to eliminate the stressor or reduce the stressor itself to make it less impactful. That's a very fast and adaptive thing but it's not often possible.

The third tactic which is essential particularly for surviving severe challenges and adapting to severe challenges like operational deployments and combat is to disengage, is to detach mentally from the source of the stress, the environment, from your own reactions to it or both. This includes denial, just withdrawing, numbness, but detachment, disengagement doesn't, doesn't really neutralize the stressor. What it does is it stores it up for later processing.

Now let me just give a quick example of these three tactics from sort of civilian experience. Let's assume that you are a runner, recreational runner and you want to train for your first ever marathon race. You want to run 26.2 miles and you've never done it before. Well that's a heck of a stress, 26.2 mile run. So to, to adapt to that stress so that you can even just do it and survive it you're going to train your body and train your mind to, for greater strength, for endurance, for speed, and to build the mental confidence and focus through you know longer and longer and longer runs to accommodate the stress.

Now there isn't much you can do to neutralize the stress of a marathon run. You can't make the course shorter or all downhill but there are things that you can do to reduce the impact of the stress. You can attend to things like hydration, make sure you eat well, wear the right clothing, maybe run with other people, to certainly having someone to run with makes the monotony less stressful. There are things you can do.

But in the end you cannot make a 26.2 mile run not painful. You cannot make it easy. You cannot make it not a challenge. So to do, to do it you have to learn to detach mentally from the pain you're going to feel, from that voice in your head that says you know what you need to stop and sit down, from the voice in your head that says you can't do this. You have to detach yourself from that. And that is for many of the stressors of operational deployments and combat a huge determinant of who is going to be able to even get through it. Pilots for example describe going, flying through rockets and tracer fire and being able to focus on only seeing the things that they need to see and denying the rest. The rest isn't there. You only see what you need to see. And that's a skill that can be learned but it's also a skill that some people are just better at. The point here is that to the extent that an individual adapts to these stressors by disengaging mentally when the stressor is over then they have to process those, those stored up perceptions.

Slide 13: Three Phases of Normal Adaptation

Another thing that's helpful in understanding the normal process of adaptation is the three phases over time of adaptation. As you can see from this slide the times of greatest perceived stress are at the very beginning and at the very end of any stressful experience whether it's just a few seconds, a few minutes like a firefight or many months, an entire deployment. Just before something starts there's dread. Right after it starts there's alarm. But then most people as they adapt they get into sort of a group where exactly perceived stress is, is less than before the whole thing started. Then at the end either because they get burned out and they develop fatigue and emergence of stress symptoms at the end or because it ends and they go home they develop, they experience rebound symptoms as they withdraw from this experience physically, mentally and as the things that they've stored up through disengagement whatever over time emerge.

Slide 14: Common "Rebound" Changes in Service Members After Deployment

This time course of adaptation and how rebound changes occur and re-adaptation occurs after deployment ends is a useful way to understand common, yet really maybe not pathological behaviors and experiences, that war fighters have after they come back. And the most common ones are increased aggressiveness. You know, while in an operational environment people are surrounded by aggression. Those who are involved in combat arms have to be very desensitized

to aggression. So that's a hard thing to sort of "turn off" or to unlearn when you come back to a society where that's not a normal means to an end. People may be more aggressive because they're irritable and agitated because of the challenge of re-adapting to being back in the United States, back with families or withdrawing from the almost drug high of the intensity of the operational deployment.

Some people even crave violence as they withdraw from that intensity. Another common experience is some degree of numbness as this disengagement, this withdrawal that is partly psychological and partly biological, possibly mediated by opiates and other stress chemicals. As this wears off after people come back they slowly normally become less numb. But for awhile they maybe you know numb to their own suffering, numb to other people's suffering and family members can sometimes be very offended that their returning spouse may seem like they just don't care.

I've had Marines come to me during deployments or shortly after very concerned that they were not feeling grief or sadness over the loss of some of their best friends, their comrades in arms. And it was helpful for them to understand that that's a normal part of their adaptation and that allowing themselves to experience that grief over time as their numbness wears off is just something they'll just have to accept.

Anyway these are some of the common rebound changes.

Slide 15: Stress Injuries Occur when Stress is too Intense or Lasts too Long

Okay, so that's all normal adaptation and re-adaptation. But what happens when an individual experiences a stress that's either too intense or lasts too long that exceeds biological, psychological, and social capacity to adapt? Well, these two pictures of trees are sort of an analogy for understanding that difference between an adaptation and an injury. The tree on the left is bent over on a craggy precipice and you get the idea that it's been blown by the wind over years and years and it adapted to this wind by growing in a curve like that. And you get the idea that this was a gradual process that could be traced over time and almost as if it were a choice made by the tree to, to grow that way. And you also get the idea it's reversible. The adaptation should be reversible. That at least theoretically if the wind were to suddenly change direction and blow for years the other way that the tree would bend back over again to the other direction.

Now the tree on the right has not been gradually bent by the wind. It has been snapped in half by the wind. This is more abrupt and it's a derailment. Now individuals who experience stress injuries invariably, if they have any self-observation at all, describe the process of losing control, of having to change himself in a derailment, something happened to them. That's not something they chose to do. They lost control. And there's reasons to believe that like all injuries, injuries caused by stress to the mind and brain are probably irreversible. Grief is a simple example. The loss of an attachment to someone to whom one feels strongly about is irreversible. You can't make that not happen. Injuries can heal though like this tree obviously is not going to heal but, it will re-grow a new tree. And it will adapt to the tree. But the injury itself cannot be undone.

Slide 16: Three Mechanisms of Stress Injury

In operational environments, through at least our experience--military experience, there seems to be three main mechanisms of stress injury. The first one is trauma, of course most people are aware of that from PTSD and acute stress disorder. Trauma is an impact injury. It's due to a specific event or several specific events involving terror or helplessness. But that's not the only mechanism of injury.

The second one we call fatigue or operational fatigue. In World War II it was called combat fatigue. And that's a wear and tear injury. That's due to the accumulation of stress over time rather than a single event or a series of impact events.

And the third mechanism is loss. And that's grief due to the loss of people or other things that are deeply cared about. And actually the symptoms that are experienced in these three different kinds of stress injuries are more alike than they are different. Of course trauma has the cardinal symptoms of re-experiencing, of nightmares, of flashbacks. But people who experience loss and grief often have preoccupations with the lost person that can be intrusive and nightmares and very similar.

All three of these often involve some degree of anxiety, some degree of anger problems. But the utility of these three different mechanisms is to broaden one's view of stress injuries so that you don't make the mistake of saying just because someone has not experienced a trauma involving terror or helplessness doesn't mean that they cannot have a significant and lasting stress injury to develop significant and lasting mental symptoms.

Slide 17: Operational Stress Injuries Correlate with DSM-IV Diagnosis

This is kind of a crosswalk between these three acute operational stress injuries, trauma, fatigue, and grief, and DSM-IV diagnoses. Of course trauma if it does not heal, if it persists, leads to the symptoms of acute stress disorder--thirty days, posttraumatic stress disorder after that. The symptoms of fatigue that have been described really Civil War, World War I, World War II are really symptoms of depression, generalized anxiety, panic. The name was coined for this kind of fatigue in the Civil War of "soldier's heart". And that was the experience of soldiers developing panic attacks that may have the only symptom they might be aware of is the paroxysms of rapid heart rate coming out of nowhere while they're trying to get to sleep. And that's just as common today as it was back then. The fatigue symptoms are actually more common in more senior people, whereas trauma probably is more common in the younger as they are more at risk for that. Fatigue, operational fatigue has sometimes been called Old Sergeant's Syndrome because it's something that a slightly older soldier or Marine is more vulnerable to. Then of course grief which can also lead to major depressive symptoms.

Slide 18: Traumatic Stress Injuries

Okay for the balance of this course I want to go through some of the specific features of one of those stress injuries, trauma or traumatic stress injury--- and go through very briefly some of the features or predictors of trauma. Of course the central feature is an experience that provokes terror, horror or helplessness. That's from the DSM.

The second feature is one that has been a great deal of research on and that is the importance of physiologic arousal and hyperarousal at the time of the traumatic experience and afterwards, persisting hyperarousal, as a predictor of long term disability.

The third feature is dissociation, which is one of the diagnostic criteria for acute stress disorder, but not necessarily PTSD.

The fourth is damage to belief system. I'm going to go briefly through some of those. And the fifth, particularly in operational environments, is shame or guilt which is really a damage to self-esteem.

Slide 19: Traumatic Events in OIF

This is just a list of some of the many, many events in Iraq, which have been shown to cause traumatic stress injuries. All, many of these involve situations that provoke terror, horror, and physiologic hyperarousal, but also many of them involve damage to belief systems. Friendly fire damages the trust that your brothers are not going to hurt you. Death or injury of children, women, of civilians, damages our belief in that we're the good guys and we don't do things like that, yet we know this is part of war, that it does happen sometimes.

Slide 20: The Greater the Exposure to Combat, the Higher the Risk for PTSD

One of the findings of the Hoge study that was published in the New England Journal in 2004 which is very interesting, is the correlation they found in those Army and Marine Corps battalions between number of firefights and prevalence of PTSD symptoms. As you can see the greater the exposure to combat the more likely, the greater number of individuals who reported PTSD symptoms, which is one of the reasons that it makes a lot of sense to consider mortal danger and exposure to mortal danger and participation in mortal danger a "toxin". The greater the exposure to the toxin the greater the risk for injury.

Slide 21: Peri-Traumatic Dissociation

Okay, I want to go briefly through peri-traumatic dissociations... kind of controversial thing. At least one type of dissociation is one of the diagnostic criteria for acute stress disorder during the first thirty days after a traumatic event. It's defined in DSM as an abrupt sort of transient loss of the normal ability to integrate perceptions, cognitions, and conceptions of the self and the world.

Historically, if you look at everything that's been written about, dissociations since the 19th Century at least, and going back in descriptions of battlefield stress casualties during the 18th Century-- there seem to be three main types or aspects to dissociation. And the most prevalent kind probably is the cognitive type, sort of depersonalization, derealization, going blank like in a trance.

But there are two other kinds I want to describe briefly. The second is more of a somatic physical kind, loss of control of one's body which was very prevalent in World War I, shell

shock cases, paralysis, deafness, stuttering, shaking, blindness, things like that, immersion disorders.

The third type is much more subtle, harder to recognize unless you know someone very well and that is the change in personality, becoming cruel or fearless or childlike. But always these involve some loss of control.

Slide 22: Controversies Over Dissociation

As I said there's many controversies over dissociation. Many studies have looked at correlation between dissociation and that long term problem, particularly PTSD. It's not always present although it's a strong predictor when it is. But it's, but many individuals experience dissociation and don't go on to long term disability. There's a great couple of studies done by Andy Morgan at Yale where he and his group studied soldiers going through survival training and simulated being a prisoner training and they found that almost all of them experienced dissociation at some point while they were undergoing stress of being a prisoner of war. But most of them did not go onto have long term problems like PTSD.

There's another controversy over whether the non-cognitive type should even be considered dissociation or what the ideology is. A lot of people think of dissociation as a defense mechanism as Freud suggested, as a choice, an unconscious choice to disengage as I said earlier. But others like Janet before Freud said there are reasons to believe that dissociation is not a choice but a symptom of brain dysfunction, a symptom of brain injury, the failure to integrate. And it may be as some like Bremner have said more recently it may be that the dissociation is just what it feels like for the brain to be injured by stress. Much as angina is what it feels like for a cardiac muscle to lose blood profusion.

Slide 23: 1. Trance-Like Dissociation

This is just some examples of the three types of dissociation. Another great example of the trance-like dissociation, cognitive dissociation, is from the movie Saving Private Ryan where Tom Hanks, an Army Captain, is charging up the beach at Normandy and while he's still in the water and the soldiers around him are being blown up and burned and shot and automatic weapons fire and artillery shells are exploding. The camera focuses on his face. His eyes get big as saucers and the sound just shhh, and he can't hear and he can't respond and he's disassociated. Then gradually, after a matter of just seconds, he kind of reconnects and is able to continue and do his job.

Slide 24: 2. Loss of Control in Dissociation

This is an example of; it's more of a somatic kind of dissociation. You get the idea that particularly the young man in the front in this picture from 9/11 is probably not thinking rationally. He's probably not in control. What used to be called hysteria is, common, a relatively common human experience of that kind of loss of control, of not being able to think rationally or control your body-- whether it's shaking or crying or screaming or something like that. And of course, you know one version of this kind of loss of control that's been part of

military cultures for a millennia is what used to be called berserk, going berserk, which is just probably a dissociative rage where people are almost always amnesic afterwards for what happened. And you know many Medal of Honor winners have described their experience of what they did that earned them that kind of honor. And many of them said you know I don't remember anything I did and others describe them as having just kind of snapped and gone into this disassociated mode.

Slide 25: 3. Personality Changes in Dissociation

This is the third kind of dissociation, personality change that some have called sort of tertiary dissociation. It's been more written about in, in adults who have undergone repetitive childhood abuse. But it's described on the battlefield too. This movie with Jeff Bridges is fearless in which Bridges plays the part of one of the few survivors of a airline crash. And after he survives, one of the few people to walk away unscratched from this crash, he snaps and he believes that he cannot be killed and he walks through traffic and he walks on the ledges of buildings as in this picture, and he's reckless. And he snaps out of it eventually. But while he's in that mode of believing this, he is not himself. He's not in touch with his normal values, his normal attitudes. And he's not behaving like himself. He doesn't care about his wife or his kids or anything. He's not himself. And that's one of the characteristics of dissociation.

In theatre, this fearless kind of dissociation-- reckless kind, is seen. But there's also another kind-- where somebody who's normally mild mannered, meek, gentle may become cruel. Or someone who is normally strong and capable may become regressed and helpless like a baby. These things of course are usually transient as most dissociations are; usually time limited and usually heal.

Slide 26: Beliefs that Can Be Damaged By Traumatic Stress

Now to just briefly survey some of the beliefs that can be damaged by traumatic stress. The first one is belief in your own basic safety, something we take for granted everyday. If we drive in traffic in a city we believe that we are safe driving seventy, eighty miles an hour in a steel vehicle surrounded by other fast moving steel vehicles. But that's an illusion. That's a denial. That's a disengagement from the stress to some extent. But what happens if that denial is shattered and you realize just how vulnerable you are and that you don't know moment to moment where the danger is going to come from. That's a difficult thing to reconstruct and recover from.

Belief in being the master of yourself. Anyone who has children knows how crucial that is to human functioning, to feel like you're in control.

Belief in what's right. Jonathan Shay wrote two very popular books about the Vietnam era, PTSD, Achilles in Vietnam and Odysseus in America. He wrote eloquently about the moral injury that some experience. Beliefs shattered may include: what's right was not what was done and followed; belief that the cause is honorable; belief that the individual is valued, and ; belief in the basic goodness of people. Some have written about the potential damage to a person's

belief system just from having killed someone. That may go against our nature to some extent... to just being required to do that.

Slide 27: Causes of Shame or Guilt In Traumatic Stress Injuries

And as I said, particularly in operational environments, another component of traumatic stress is the damage done to self-esteem that we normally call shame or guilt. And a couple of the reasons for this. I think that this maybe more common than some other kinds of trauma. Unlike traumatized people who are merely victims of a horrible event, war fighters are also to some extent obviously perpetrators. And they also, because loss of comrades, (through death or injury) they often are left. Those who survive are left feeling very guilty about just having survived and about not having to protect, not having been able to protect their, the closest friends they'll ever have in their lives. That's a part of grieving that is common for anyone who has lost someone close to them to afterward. They often feel like gosh I wish I had done more. I wish I had let them know how much they mattered to me. So those are often reasons that war fighters are left feeling guilty or ashamed. Just having lost control.

People who have never had a dissociative episode, have never had a stress injury cannot conceive how ashamed that can make someone feel-- to lose control, to have stress symptoms, to have a dissociative episode. And even more, perhaps for war fighters, is to have this ideal that they're trying to live up to. And as I said, that makes it very difficult for them to maybe even admit to themselves that they are having difficulties.

Slide 28: What is Damaged in the Brain in Combat Stress Injuries?

So the last thing I want to touch on briefly here is talk about some of the psychological injury of traumatic stress to belief systems, to self-esteem. But I think it's very useful, particularly dealing with warriors, is to acknowledge the biological components of stress injuries, particularly traumatic stress. I don't have time here to go through this in any depth, but I know there are other courses addressing this. But there is ample evidence that one of the types of biological damages that either severe or prolonged stress can cause, is a shift in set points in the brain-- rather than homeostasis, there's allostasis-- equilibrium is regained by shifting set points. And particularly by up or down-regulating receptors. So that if a neurotransmitter is depleted then there maybe the brain systems that use that neurotransmitter may try to adapt and compensate by creating more receptors for it so that enough signals can get through again. So those fewer neurotransmitter chemicals are enough to cause the signal to get through the gaps, the synaptic gaps.

The problem with these kinds of allostatic shifts and set points is that they may persist long after the stress is removed. They may become permanent. And that's certainly a theory at least that has been used to explain both the ideology, biological cause of depression and anxiety disorders, but also how and why medications like the serotonin reuptake inhibitors improve these symptoms-- because they cause those set points to shift back again. Some of the other biological changes in the brain due to stress: increase in corticotrophin releasing factor, which is a kind of a master anxiety producing stress chemical, and a decrease in neuropeptide-Y, which is kind of the

opposite of CRF. It's sort of a natural anti-anxiety chemical that is produced in the brain as stress accumulates.

There's also in evidence of possible hippocampal dysfunction and possibly even damage to the hippocampus due to stress. This is a very controversial area. People are divided in their views of this. But pre-clinical studies using animals have made it very clear that the rates of regrowth of hippocampal neurons can be significantly reduced by severe stress. This is mediated perhaps by cortisol so that the hippocampus (which is a very important component of adaptation, of memory, of controlling behavior) can become less and less functional and shrink over time as cells die and they're not replaced. And there is evidence in certainly pre-clinical studies of animals that glutamate neurons and the hippocampus-- once they're excited beyond a certain point, they may actually suffer excitotoxicity and actually die.

Slide 29: Summary

So in summary, most war fighters are resilient and most recover quickly from their stress-- both during deployment and after homecoming. But aiding those, identifying those who have persistent stress problems requires sensitivity to their military cultures and to their identity. Common normal post-deployment stress problems include aggression, substance abuse, and emotional numbness. These normal post-deployment stress problems are, by definition, reversible and normally go away after a few months of returning. Stress injuries occur when stress is too intense or lasts too long. The three mechanisms of stress injury are trauma, fatigue, and grief. And traumatic stress injuries are comprised of both biological damage to the brain systems and psychosocial damage to beliefs and self-esteem.

Thank you very much for your attention.