

**TRAUMATIC BRAIN INJURY RELATED
VISION ISSUES**

HEARING
BEFORE THE
SUBCOMMITTEE ON OVERSIGHT AND
INVESTIGATIONS
OF THE
COMMITTEE ON VETERANS' AFFAIRS
U.S. HOUSE OF REPRESENTATIVES
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TRAUMATIC BRAIN INJURY RELATED VISION ISSUES

WEDNESDAY, APRIL 2, 2008

U.S. HOUSE OF REPRESENTATIVES,
COMMITTEE ON VETERANS' AFFAIRS,
SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS,
Washington, DC.

The Subcommittee met, pursuant to notice, at 10:07 a.m., in Room 334, Cannon House Office Building, Hon. Harry E. Mitchell [Chairman of the Subcommittee] presiding.

Present: Representatives Mitchell, Space, Walz, and Brown-Waite.

Also Present: Representatives Brown of Florida and Boozman.

OPENING STATEMENT OF CHAIRMAN MITCHELL

Mr. MITCHELL. Good morning and welcome to the Subcommittee on Oversight and Investigations. This is a hearing on traumatic brain injury (TBI) related vision issues. This hearing will come to order.

We are here today to hear from veterans and the U.S. Department of Veterans Affairs (VA) about a very serious problem in the care of wounded servicemembers that has been overlooked for too long. Traumatic brain injury, TBI, is one of the signature issues of the wars in Iraq and Afghanistan. I am afraid that vision problems are becoming the unrecognized result of that injury.

Research being conducted by physicians, psychologists, and blind rehabilitation specialists at the VA Palo Alto Polytrauma Rehabilitation Center and the VA Western Blind Rehabilitation Center shows that TBI causes serious vision disturbances in a large number of cases even when the veteran retains 20/20 vision, and without any obvious injury to the eye. We will be hearing today from Staff Sergeant Brian Pearce and Petty Officer Glenn Minney, Iraq veterans who are legally blind as a result of TBI.

Staff Sergeant Pearce and Petty Officer Minney do not have happy stories to tell us about their experiences after they were injured. We owe these two a great deal of debt for their service. Both of their TBI-related vision issues went unrecognized and untreated for a long time.

The wars in Iraq and Afghanistan have forced us to deal with unexpected and often unpleasant realities. But we know now that military and VA healthcare providers must be especially alert to vision defects resulting from TBI—even when there is no obvious physical injury to the eye.

This is not only critical so that these vision deficits can be addressed, but also because undiagnosed vision problems can seriously interfere with TBI rehabilitation and also rehabilitation for other injuries that often occur along with TBI.

Following our first panel, we will be hearing from several companies that are working with the VA to provide innovative treatment for TBI-related vision deficits. Our third panel consists of witnesses that are from the U.S. Department of Defense (DoD) and the VA.

Two of the researchers from the Palo Alto VA are leading efforts to better identify and diagnose vision deficits in TBI patients. They are to be commended for their cutting edge work. In the 2008 National Defense Authorization Act, Congress directed DoD and VA to create a cooperative program specifically to address TBI-related vision issues. We are looking forward to hearing exactly what it is that the Departments are doing, how they are directing funds for their efforts, and when they expect to have a fully functional program.

I am also very interested to see whether DoD and VA are currently doing all they can to identify and track these patients, not just at Palo Alto but everywhere. Because the seriousness and the extent of vision problems resulting from TBI are just now becoming better known, we would like to hear from the Departments what they are doing to identify and contact TBI patients whose vision issues may have been overlooked.

Our veterans served honorably to protect our Nation. We have a responsibility to take care of them when they come back home.

[The prepared statement of Chairman Mitchell appears on p. 43.]

Mr. MITCHELL. Before I recognize the Ranking Republican Member for her remarks, I would like to swear in our witnesses. I would ask that all witnesses please stand and rise from all three panels.

[Witnesses sworn.]

Thank you.

Next I ask unanimous consent that Ms. Brown and Mr. Boozman be invited to sit at the dais at the Subcommittee hearing today.

Hearing no objection, so ordered.

I now recognize Ms. Brown-Waite for her opening remarks.

OPENING STATEMENT OF HON. GINNY BROWN-WAITE

Ms. BROWN-WAITE. Good morning and I certainly thank the Chairman for recognizing me.

I appreciate your calling this hearing to allow us to review how the Department of Veterans Affairs and the Department of Defense are evaluating and treating vision problems encountered by Operation Iraqi Freedom/Operation Enduring Freedom (OIF/OEF) soldiers and veterans returning home with traumatic brain injuries.

As we know, this was is different in many ways from those of the past. Soldiers who sustain injuries that would have resulted in death in previous conflicts now have a much greater survival rate. However, survival does not necessarily mean returning home to a normal way of life.

Improvised Explosive Devices, IEDs, and now Explosive Forced Projectiles, EFPs, cause some of the most serious injuries among OIF/OEF soldiers. Because of these types of attacks, many of our most severely injured veterans experience traumatic brain injury

and require treatment at one of the four Polytrauma Centers around the country.

The Polytrauma Rehabilitation Center (PRC) nearest my district is at James A. Haley Medical Center in Tampa. Where I visit there frequently, I see firsthand the tremendous strides that wounded soldiers make.

I am also very pleased that the VA has made a commitment to expand the PRC Network to include a facility in San Antonio, Texas.

Treating these severely wounded servicemembers has been a learning process. As our physicians treat the various and previously unseen injuries from IEDs/EFB blasts, we learn more about the resulting co-morbid conditions, such as visual impairments suffered by our servicemembers. From information that I have obtained over 44,000 veterans have utilized the services of VHA's blind rehabilitation program.

We here on the Committee need to be assured that these veterans are receiving the care and services that they desire and are deserving of. I look forward to hearing the opinions of our first panel as to the evaluation, treatment, and care they received while moving from the battlefield through to the VA.

I have read the testimony, and again the transitions you made going from the Department of Defense to VA have not been an easy road to follow. I would like to ask the administration officials sitting behind you to listen very closely to your testimonies. The situations you have encountered along your path to recovery need to be resolved by both departments so that others do not face similar problems in the future. We appreciate you coming forth with the individual stories that you have and experiences that you had.

I also look forward to hearing from officials from the Palo Alto VAMC on the research they are doing with respect to vision issues related to a Polytrauma. I would hope that they are sharing their experiences, methodologies and treatment plans with the other PRCs.

As I have stated in the past, all medical centers need to be sharing their best practices with one another so that our veterans and servicemembers receive the very best possible care. This is particularly critical in the area of TBI where treatments are often on the cutting edge.

I would like to commend the work of the BVA, the Blinded Veterans Association, for their efforts. I look forward to hearing what they and their members have encountered when helping veterans navigate the system.

Thank you again, Mr. Chairman, for calling this hearing and at this point I yield back the balance of my time.

[The prepared statement of Congresswoman Brown-Waite appears on p. 43.]

Mr. MITCHELL. Thank you. Mr. Space.

OPENING STATEMENT OF HON. ZACHARY T. SPACE

Mr. SPACE. Thank you, Mr. Chairman. I am pleased to welcome Glenn Minney from my region, along with my colleague Dave Hobson whose district abuts my district in Ohio, and of course Mr. Zampieri as well. We are happy to have him here today to testify

regarding the somewhat unseen results of this war. And I use that word with a tone of irony.

Mr. Minney is here to tell us about his experiences in Iraq. I was honored to have him in my office last night with Mr. Zampieri to talk very candidly about both the problems associated with the transition from DoD to the VA, as well as the problems associated with those coming back from this war with traumatic brain injury, which in many cases leads to attendant eye injury. We are again honored to have Mr. Minney here. I know it took an act of courage to come and testify today and I would like to thank him for that. Welcome.

Mr. MITCHELL. I ask unanimous consent that all Members have 5 legislative days to submit a statement for the record. Hearing no objection, so ordered.

At this time I would like to recognize Congressman Eric Cantor of Virginia, who is here to introduce his constituent, Staff Sergeant Brian Pearce, and his wife Angela.

Congressman Cantor.

OPENING STATEMENT OF HON. ERIC CANTOR

Mr. CANTOR. Thank you, Mr. Chairman. Chairman Mitchell, and Ranking Member Brown-Waite, I want to thank you very much for having this hearing and thank you for having me here this morning.

It is my privilege to introduce Sergeant Brian Pearce, a resident of my district who is a combat veteran of the U.S. Army and an honorable patriot.

He and his wife Angie came up yesterday from Mechanicsville, Virginia, to lend their story to the proceedings here this morning.

Sergeant Pearce was injured in 2006 while serving with the Army near Baghdad. The vision loss, which occurred from his injuries is unique in that his eyes are fine. It is his brain which sustained the injury and which caused the optic nerve within the brain to stop working. While his eyes see 20/20 his brain cannot receive and process those images in full. In his words, he sees as if he is looking through a drinking straw. His recovery and transition back to civilian life has not been easy. His service to our country is admirable. His courage amidst new challenges is inspirational. I have no doubt that his testimony will help us understand how we can better serve the needs of our returning soldiers from the hospital bed and beyond as they recover from the loss of vision due to brain related injuries. I would also like to thank again, his wife, Angie, who has been a tireless advocate for his care throughout this arduous process and I thank you again and yield back.

Mr. MITCHELL. Thank you. Next I would like to recognize Congressman Dave Hobson of Ohio who is here to introduce his constituent Petty Officer Glenn Minney.

Congressman Hobson.

OPENING STATEMENT OF HON. DAVID L. HOBSON

Mr. HOBSON. Thank you Mr. Chairman and Members of the Subcommittee. I appreciate the opportunity to introduce a constituent of mine who is appearing before you today. As mentioned his name is Glenn Minney and he is a retired Navy medic who served in

Lima Company, a Marine reserve unit of the 3rd Battalion, 25th Regiment, based in my district. I just missed him when I was in Iraq with Mr. Murtha at the Haditha Dam, and he pointed out to me that the mortar hole in the dam was the one that caused his injury. Lima Company was assigned to Haditha, Iraq, and while he worked to treat the medical needs of his unit he himself was injured by a mortar blast, as I talked about.

It is that blast had caused a traumatic brain injury and a severe visual problems that he is here to talk about today. And while Glenn is appearing today as an Iraqi combat veteran, he is also a patient advocate for the VA Medical Center in Chillicothe, Ohio, in my district and I think it is a county that Mr. Space and I both share there.

I met with Glenn in my office yesterday and I asked him if there was anything that he wanted me say. He said that he was just a man who was trying to make a difference for other soldiers who have suffered from traumatic brain injuries that have left them with severe visual problems.

During our conversation, I learned that there is a problem with the Department of Defense and maybe a certain official there in moving forward with the Military Eye Trauma Center of Excellence and Eye Trauma Registry. I am glad that this problem was brought to my attention. I am having my staff check this out from the funding side, as I am a Member of the Defense Appropriations Committee and working with Dr. Tom Zampieri from the Blinded Veterans Association on this issue, I assure you that I'm going to bring it to my Chairman's attention and my Ranking Member's attention on the Defense Appropriations Committee.

I'm sorry I can't stay for this hearing because I'm supposed to be the Ranking Member at the Energy and Water hearing that is going on right now on nuclear weapons. So I need to get there. But I hope this is an issue that we can bring to a successful conclusion because these people are our heroes and we need to take care of them.

Thank you, Mr. Chairman.

Mr. MITCHELL. Thank you. At this time I would like to recognize in this order, Sergeant Pearce, Petty Officer Minney and Dr. Zampieri for 5 minutes each.

STATEMENTS OF STAFF SERGEANT BRIAN K. PEARCE, USA (RET.) (U.S. ARMY COMBAT VETERAN), AND ANGELA M. PEARCE, MECHANICSVILLE, VA; PETTY OFFICER GLENN MINNEY, USN (RET.), FRANKFORT, OH (U.S. NAVY COMBAT VETERAN); AND THOMAS ZAMPIERI, PH.D., DIRECTOR OF GOVERNMENT RELATIONS, BLINDED VETERANS ASSOCIATION

STATEMENT OF STAFF SERGEANT BRIAN K. PEARCE

Staff Sergeant PEARCE. Chairman Mitchell, Members of the Subcommittee, thank you for the opportunity to speak to you today regarding our experiences following my injuries in Iraq and during my medical care to date.

I joined the Army in June 1992 and served until March of 2000, joining the West Virginia Army Reserve and National Guard. After

a 3-year service break, I returned to active duty in January of 2004. Joining my new duty station in Alaska, which was the 172nd Stryker Brigade Combat Team from of Ft. Wainwright. I was then assigned to 4–11th Field Artillery as the brigade’s Survey/Targeting Acquisition Chief. After an intense training period we deployed in July of 2005. My brigade combat team spent August of 2005 through August 2006 operating in the Mosul area of Iraq.

As the brigade prepared to re-deploy home to Ft. Wainwright in July we were extended for 120 days. I had already been returned to Alaska in June to prepare for the brigade’s homecoming. Then I was called back to Iraq in August of 2006, in our new area of responsibility in the Sunni Triangle.

On October 20, 2006, I was severely injured by an IED blast that caused shrapnel to penetrate the right occipital lobe of my skull. Once the blast zone had been secured and I was air evacuated to the field hospital in Balad, there I underwent an emergency craniotomy to the right occipital lobe and posterior fossa with duraplasty. I also retained foreign body and was considered to have cortical blindness. Later we learned it was the cause of more complex visual impairments such as post traumatic stress disorder (PTSD), hearing loss, pulmonary embolism, seizures and rapid eye movement sleep and seizure disorders.

During this time my wife was contacted in Alaska and told that I had been involved in an IED blast and was in stable condition complaining of neck injuries. Roughly 3 hours later she was contacted by my commander who was in Iraq with me and he then told her that I had come through the brain surgery fine, and was listed in very critical condition and—excuse me, I lost my place and my wife has to help me here.

Ms. ANGELA PEARCE. He was listed in critical condition and at that time we didn’t realize that there was any blindness until his PA’s wife came over to the house to talk to me to see how I was and bring dinner. At that time she informed me that my husband had no vision and of course I didn’t know what was going on.

So I initially got back in contact with the doctor in Balad. On 21 October, he informed me that my husband was diagnosed with cortical blindness and that we did not know whether his eyesight would come back or not. That was all that was said.

Then they evacuated him to Landstuhl, Germany, on the 21st. He had to go through another surgery there to clean out—where he had a bleed out. And so, he was there until they transferred him to Bethesda, Maryland, to the hospital first. He had to have an angiogram done there and then on to Walter Reed.

So from 25 October until December 5, 2006, he was in an ICU unit at Walter Reed.

All this time I was asking about his vision, I kept being told, his vision does not matter at this time, we need to take care of his traumatic brain injury. And so he was transferred to Richmond at that point. I made that decision to transfer him to Richmond McGuire’s VA at that time. So then he continued to go on with his care.

They did have a BROS there and they did work with him, but the BROS got frustrated with all the bureaucracy and he left.

So we went from—he left in June of 2007, and so Brian went from 2007 of June until October when he went to West Haven, Connecticut, to the Blind Rehab Center before he had any more care. And so there was a big lapse there. And we kept being told that, you know, his vision is the last thing that needs to be worried about at this time. So we had no idea what was going on with his vision.

Once he got to Connecticut, we found out that his vision was a lot more extensive than what we were told.

So, therefore, my big question is, had we been given the appropriate information from the very get go, would I have gotten better care for him elsewhere and would he have strived better in other therapies along with getting visual therapy. And there is no—as far as I know it is not being documented anywhere how many visual impairments that there are. And I would ask you here; do any of you know how many are coming out of the combat zone that have visual impairments and if you do not, I challenge you to find out and start with getting documentation for this to get care for these soldiers. There has to be something documented somewhere. And not to take away from the amputees or any other signature wound, but we need to get stuff for traumatic brain injury with visual impairments.

Most people do not understand that the vision and the brain go hand-in-hand. And with my husband's injury it is not from his eyes, it is from his brain injury. His brain will not allow his eyes to function to see. He can see straight ahead of him about eight degrees, no more. There is nothing on either side of him.

So I really strongly encourage that this panel makes something happen and it starts getting documented and money is out there to take care of these guys.

And again, I thank you for your time.

[The prepared statement of Staff Sergeant Pearce appears on p. 45.]

Mr. MITCHELL. Thank you.

Petty Officer Minney.

STATEMENT OF PETTY OFFICER GLENN MINNEY

Petty Officer MINNEY. Once again I would like to thank you, Mr. Mitchell and the rest of the panel for allowing me to speak today. It is easier to see this way.

I first joined the Navy on September 4, 1985, where I attended Basic Training and Naval Hospital Corps School in Great Lakes, Illinois. After doing a tour of active duty, I came back to Ohio and I joined the Reserves in Columbus, Ohio. At that point I was attached to Lima Company 3rd Battalion, 25th Marines.

On January 3rd of 2005, 3rd Battalion, 25th Marines was called to active duty to serve in Iraq. After spending 2 months at Twentynine Palms, California, doing a train up, we left for Iraq.

The 3/25 was assigned to Haditha, Iraq, and also to Hit. The majority of the battalion was assigned to Haditha Dam. A 10-story hydroelectric dam that was used as a firm base.

We had to make makeshift chow halls, sleeping quarters inside engine rooms, and a Battalion Aid Station in a electrical elevator room.

On April 18, 2005, at approximately 16:30, I was on the 10th story of the dam. While I was out trying to obtain medical supplies from a Conex Box, a mortar round hit the dam. At that point I was propelled backward and thrown up against the railing. Thank goodness there was a railing there, or I would have plummeted 10 stories down. But I hit the rail. The next thing I remember, I was running toward the Battalion Aid Station. I remember a flash of light and that is it. I went back to the Battalion Aid Station ready to assist in taking casualties.

Well the next day, I noticed my eyes were a little scratchy and a little red. I went to the Battalion Aid Station and they told me, you have pinkeye. So they treated me for pinkeye. It continued on. A few months later I went back with the same symptoms. You have pinkeye. I logged this into the sick call log. I was given Motrin and Erythromycin. But the primitive equipment that we had at the Battalion Aid Station, just an ophthalmoscope, was not really able to detect what was going on in the back of my eye.

At that point I noticed that I was becoming more of a liability than an asset because I would go out on patrols and I could not see well enough to fire my weapon.

I went to my battalion surgeon and I told him, I am losing my sight. He then notified Al Asad. I was medivaced to Al Asad in August. From Al Asad to Balad to Homburg or to Landstuhl, Germany. Then from Landstuhl they sent me to the German hospital at Homburg, Germany, where I underwent two eye surgeries on the 16th and 17th of August.

You have to excuse me for a moment.

After having my surgeries I was then sent home to Bethesda, Bethesda Naval Medical Center. From Bethesda they said I am still in the healing process, you have to go back to Ohio, and from there I was put on convalescent leave.

The second day I was home my eyes reattached. I lost my vision. I went to Grant Medical Center. They performed another surgery that evening on me to help save my sight. From there I went back home and I had to lay face down for almost a month. I was not able to do anything. At that point no one knew who I belonged to. What unit does he belong to, because I am on convalescent leave and now I am past my 30 days convalescent leave. No one wanted to take care of who I was so I was in limbo.

All this time I was at home. I went back to my VA to ask for care. I was told, you are active duty. You cannot get care here. You have TRICARE. Well, from that point I got upset and went to the associate director, who at that point said, you get all the care you need here in Chillicothe VA.

I am instrumental for the Chillicothe VA for the simple fact they done something. They recommended I get an MRI of my head. But before they could do that I was sent back to Camp Lejeune to the Wounded Warrior Barracks for therapy and then that is where I had an magnetic resonance imaging (MRI).

Ladies and gentlemen, Homburg, Germany, Landstuhl, Bethesda, Grant, none of these major medical facilities bothered to look inside my head. The VA did in there and that is when they were able to discover that I had a traumatic brain injury. I had lost a portion of my parietal and occipital lobe which works my eyes.

They could not figure out, you have had three surgeries, how come your eyes are not getting any better. because you never bothered to look outside the box and look at my brain. Maybe that is where the problem was and that is why I am here today with Mr. Zampieri and Sergeant Pearce. We need to start looking, you know, look outside the box. There are other injuries that cause traumatic brain injuries.

And I would like to say this, at no time while I was in Iraq did I ever go on patrol nor any of my marines and we said it is too costly to go down that alley, or go on this patrol because it is too risky or it is too costly.

Well now how come DoD and the VA can come back and say, well we cannot provide this care or that care because it is too costly. I never said it was ever too costly so why should these agencies say the same to me.

Thank you.

[The prepared statement of Petty Officer Minney appears on p. 48.]

Mr. MITCHELL. Thank you. Finally Dr. Zampieri is the Director of Government Affairs for the Blinded Veterans Association (BVA) and is here to discuss the nationwide implication of TBI related vision problems. Thank you.

STATEMENT OF THOMAS ZAMPIERI, PH.D.

Dr. ZAMPIERI. Thank you, Mr. Chairman and Ranking Member and other Members of the Subcommittee for having this hearing today.

The Blinded Veterans Association has been in existence for 63 years. Since the end of World War II and we're trying to dedicate ourselves to helping all of our Nation's blinded veterans and their families.

It is an honor for me to be here today with these two witnesses who served their country and did a great job. And it is sad though that in preparing for this hearing when I was asked how many witnesses do you have possibly to come and speak, there is at least 12 others with similar stories. And that should be very disturbing to the Members in this room.

These are not a couple, quote, accidents that fell through the cracks. And there are other cases out there that are very similar to this. And so hopefully, at the conclusion of this hearing today, there will be some major steps taken toward fixing this in regards to administratively and clinically better coordination between the Department of Defense and the VA in regards to all of the eye injured casualties returning.

The numbers seem to be a moving target here. When I first started this job 3 years ago, I was just asking people how many eye injured have come from either Iraq or Afghanistan? No one seemed to be able to tell me. And if you go back and look at some of my earlier testimonies from a couple of years ago, they were drastically lower. And in reality, if people had really started to look at this issue earlier, they would have realized from looking at the International Classification of Diseases (ICD)-9 codes that the VA had, and also DoD, that the numbers were growing rapidly as early as in 2005. Here we are in 2008, the most recent numbers that I can

come up with is close to 1,400 combat-eye injured, battle-injured eyes. And there is another component, which is the reason for this hearing is the traumatic brain injuries and the visual impairments associated with TBI.

So individuals who can have the penetrating eye injuries from battle-related injuries, they are obvious. But the ones that come back who have had repeated head concussions and have suffered from a traumatic brain injury like with Glenn Minney and Sergeant Pearce, their injury is in the back of the brain are effecting their vision. And with their other emphasis on other types of manifestations neurologically of these TBIs, I think what happens is a lot of times the initial assessment is, well, your eyes appear normal. And both of these gentlemen have been told by people who have come up to them and said, well your eyes look okay there must not be anything else wrong.

The neurological pathways in the brain—I put a lot in my testimony, not to overwhelm anybody, but I think it is important that people understand one critical thing here today. That vision is 70 percent of our awareness of our environment. The other senses that you learned about in school as far as hearing, touch, smell, taste, we are visual animals. And so if you have a traumatic brain injury and any of these different pathways are disrupted as in my written testimony, it can cause a huge number of different types of visual problems. Anywhere from color blindness to loss of peripheral field vision, depth perception and all of these various neurological complications from TBI that effect vision will effect everything else. Rehabilitation, vocational training, it is certainly going to have a negative impact on employment. And so we worked with Congress last year to get the Military Eye Trauma Center of Excellence included in the National Defense Authorization Bill as part of the Wounded Warrior legislation and I appreciate and thank the Members in this room who helped get that passed.

I think it was everybody's intent that the DoD would establish a TBI Center of Excellence, a PTSD Center of Excellence and a Military Eye Trauma Center of Excellence. And that these centers would collaborate, work jointly, provide follow-up, best practices, look at what is going on in regards to the specific types of neurological research, both in eye and vision research, but also in other areas. They would be educators of the different practitioners that are dealing with these types of injured casualties coming into the VA and the DoD facilities. And importantly, also work with the families. One of the things that has bothered me the most about this is when I meet with a lot of these servicemembers families who have had eye injuries they are rarely given much information about what is low vision. You know, what would happen if Glenn Minney or Sergeant Pearce is—if they are transferred into the blind rehabilitative centers.

You know, the good news is, there is always—I try any way to balance bad news with good news. The VA—and I thank former Secretary Nicholson, and Dr. Kussman. The VA started planning a couple of years ago for the full continuum of care for low vision and blind veterans. And they have implemented and started to open a large number of outpatient specialized clinics with ophthalmologists and optometrists and with blind rehabilitative specialist

and vision specialists and they are in the process of hiring these people. There are about 54 different VA Medical Centers that have been identified to have these new types of programs and so they are ideal for not only the aging population of veterans that they were created for with degenerative eye diseases, but for this generation who have different types of visual impairments that need care and services.

Again, you ask though, does DoD know where these sites are, are they working collaboratively, are they providing accurate numbers to the VA people. I doubt it. And so my experience has been that the moving numbers here are amazing.

Basically, I included a lot of recommendations and hopefully you'll look at those and consider them. I do want to stress again that my interaction with the VA and DoD ophthalmologist and optometrist is, I am amazed and impressed at their abilities. And if you go back historically and look at the results of eye trauma from World War II, most of those soldiers just lost their eyes. They were surgically removed. And today due to advanced skills of the ophthalmologist serving in Iraq and in Landstuhl, Germany, and the surgeons at Walter Reed and Bethesda, I have the greatest respect for what they are doing. It is just simply amazing.

So this is not a hearing about a healthcare problem in the sense of are they not doing something medically that they should be doing. And I just wanted to stress that. This is about the age old problems of two bureaucracies talking to each other facilitating the implementation of this Military Eye Trauma Center of Excellence as Congressman Boozman and I had hoped, and make this work. And so again, I appreciate this opportunity to testify today and will be willing to answer any questions and thank you all again for having this hearing.

[The prepared statement of Dr. Zampieri, appears on p. 50.]

Mr. MITCHELL. Thank you. I have a question of Mr. Pearce. Is there any care that you are currently receiving that you need? Let me put it this way. Is there any care that you are not currently receiving but need, or could it be better?

Ms. ANGELA PEARCE. I would like to answer that if you do not mind. The care that we received—that Brian has received from the VA has been excellent. I was left with the decision of where do I take my husband after he comes out of the ICU Unit. He spent 47 days being in the ICU Unit and 1 day on the floor at Walter Reed. We didn't have a good experience at Walter Reed.

So, you know, and I had heard all these horror stories about VA. So then it was left up to me to make a decision where do I take my husband now. And so I chose Richmond. The only reason I had chose Richmond is I had had a friend there previously. I had to go off and leave my 7- and 8-year-old, at the time, in Alaska to come be by his bedside. So we are originally from Ohio. We were going to send the kids to Ohio with family. Okay, Richmond is the closest place for me to be able to get with my kids if I need to. I am glad that I made the decision to take him to Richmond. He has received wonderful care there. And I did take him there knowing that they did not have a full-blown blind rehab center. But again, you have to remember, I was told, do not worry about his vision, that is the last thing we need to worry about. Had I been told more, I would

have probably chose somewhere different to take him and that is the question I have to ask, and I will continue to ask. Had I known ahead of time more about his visual impairment would I have chose Richmond? Probably not. He got good care there, but not for his vision.

So that makes me wonder, did we—was he able to get and gain all the therapy that he really needed? If I would have taken him to Palo Alto would he have gained more from there and be further along now?

So as far as your question, we received great care there. And we still continue to receive great care there. Brian.

Staff Sergeant PEARCE. The only thing I will add is that, and it is kind of—it goes away from your question a little bit, but it goes back to the same thing with the eyes and the vision and not knowing. When we left Walter Reed and we went to Richmond the answer was or their statement was, do not worry about the vision, the main problem is the TBI. That is the main thing we kept hearing all the time. Do not worry about your vision, worry about your TBI. Do not worry about your vision, worry about the TBI.

Well I spent 16 years in the Army, and learned from day one to know that bad news does not get any better with time. You are not going to wake up on the 5th day and all of a sudden it is good news. It is not going to happen.

Telling me at day one, son, you are blind. I got it. Okay, let me move on and live with it. And they did not do that. They need to start being up front about what is there, and what you have to live with. I have a whole new norm now I have to deal with and an 8- and a 9-year-old and—well they are now 9 and 10—a 9- and a 10-year-old and a wife that I have to try and figure out how I am going live a new norm for a lifetime with.

Mr. MITCHELL. Thank you. Mr. Minney can you give us some suggestions that could improve the VA outreach to veterans who have been injured with TBI that later are experiencing vision problems?

Petty Officer MINNEY. The one thing that I can see is there needs to be more of a communication between DoD and VA. When an individual is in the military they have a health record jacket. I had mine, so the VA was able to go back and look at that. But there are guys that come in to the VA system that do not have a health record so when they start their process, their transition from DoD to the VA, there is no health record. So the VA has to start from ground zero and this servicemember has to go through every physical exam, every bit of treatment that he went through DoD once again through the VA. If those records were just taken from DoD—if DoD would just share them completely with the VA there would be a better seamless transition there. That is one thing that I can see that could help with the visually impaired. Because every eye exam, which some of them are painful, that I have had to go through, I had to go through three and four times, because the VA said well we do not have copies of your military health record we have to do it all over again. Well it just so happens being a good corpsman, I kept copies so I didn't have to go through every eye exam. But there are guys out there that do. They have to go through every physical evaluation all over again.

Mr. MITCHELL. Thank you. We have heard that same story since we have been having these hearings.

Ms. Brown-Waite.

Ms. BROWN-WAITE. Thank you, Mr. Chairman. Dr. Zampieri when I look through your testimony there were different estimates in there of the number of blinded veterans as a result of serving in Iraq and Afghanistan. What is the final number, I mean, as of maybe the beginning of this year even? Because there seems to be conflicting percentages and numbers and is—and in your testimony, I think, you mentioned that there was an official report. What was that number and is it an official report? I think it said “estimated to be.”

Dr. ZAMPIERI. Yes, thank you. The numbers, I think, are like trying to get the accurate numbers on traumatic brain injuries at large and unfortunately, you know, I have been told recently that the number last September was this number that I put in there of 1,162 as of September 17, 2007. Now these are not all blind and I am glad you asked that question. The VA is aware of approximately 100 to 104 OIF/OEF veterans who are legally blind, which is 2200 or less or 20 degrees of peripheral vision loss or less.

So the actual number who are blind is a small percentage, really of the total number though have suffered major eye injuries. And what one of our biggest fears is that the ones that had initially successful surgeries the other 1,100, are at risk if they get lost between the systems and do not get follow up of complications. And there is three common complications, to make a short answer long, that most ophthalmologists are very concerned with this population of veterans and that is traumatic cataracts, glaucoma and detached retinas that can occur seemingly almost at anytime after somebody has sustained a traumatic injury. And these are types of things that normally in the private sector ophthalmologists or optometrists would see in a very old population of individuals.

We think of glaucoma as something that our parents get. We think of cataracts as something a 70-year-old gets. But I met a 24-year-old Army sergeant with cataracts. I met a 28-year-old Army lieutenant who was blinded in his right eye. His right eye was enucleated in Iraq, and surgically removed. His left eye was, quote, normal but they found at Walter Reed fortunately when they tested him just before he was to be discharged he had glaucoma with pressures equivalent to what a 65-year-old might have.

So the actual number of blinded individuals that are enrolled in the VA Visual Impairment Service Team Program is about 104, but there is these other 1,100 or 1,200 out there that have sustained major eye injuries. And then the experts who will testify later may tell you that there are neuro-ophthalmologists who believe looking at the TBI data and private research numbers that as many as 7,000 TBI patients probably, which is in my testimony, have some type of visual TBI impairment. And when you look at hearing loss and vision loss combined, I would say that this is sort of like the silent epidemic from the war that most people have not really started to add up and look at. So thank you.

Ms. BROWN-WAITE. Thank you very much. The conditions you described, the cataract condition, the glaucoma, and detached retina, when you have those technically that is where you are considered

legally blind. In most States that would be the definition of legally blind, am I correct?

Dr. ZAMPIERI. Yes. They can result in blindness especially the detached retinas and the glaucoma.

Ms. BROWN-WAITE. Right.

Dr. ZAMPIERI. In fact, there was recently a survey. The National Eye Institute did a survey of Americans and they asked them, you know, like do you recognize information or do you know about glaucoma. And only 8 percent of the Americans that they surveyed said that they had any idea that glaucoma does not cause any symptoms. There is no pain. There is initially no problems that the person is going to be aware of. And then suddenly the pressures—if they last long enough on the optic nerve they will go blind.

Whereas cataracts can be operated on and removed and the vision will return. I guess one of the interesting things about cataracts though is when you do cataract surgery in a 70-year-old, most ophthalmologist are well aware of, you know, 10 years later what might happen. I do not think many people have a lot of experience with 24-year-old who have had cataract surgery what will happen to them when they are 45 years old or 60 years old.

So there is a great need here for a lot of long-term longitudinal research on all of these types eye injured casualties. And those are great questions.

Ms. BROWN-WAITE. Thank you very much doctor. I yield back the balance of my time.

Mr. MITCHELL. Thank you. Mr. Space.

Mr. SPACE. I thank you, Mr. Chairman. Mr. Minney, how much time expired between the date of your injury and the date that you were diagnosed with traumatic brain injury?

Petty Officer MINNEY. My injury was in April of 2005 and I want to say I was diagnosed with a traumatic brain injury in February of 2006.

Mr. SPACE. So roughly 10 months?

Petty Officer MINNEY. Yes.

Mr. SPACE. And that would have been after the magnetic resonance imaging (MRI)?

Petty Officer MINNEY. No, the MRI is what discovered the brain injury.

Mr. SPACE. Right. But you were not diagnosed until you had the MRI done?

Petty Officer MINNEY. Right.

Mr. SPACE. I understand that was recommended by a VA facility.

Petty Officer MINNEY. Yes, they had recommended it but I was at Camp Lejeune so—

Mr. SPACE. It was within the jurisdiction of the Department of Defense. And you had been in a number of medical providers prior to that under the ambit of the DoD and not once had anyone recommended an MRI until the VA recommended it?

Petty Officer MINNEY. No MRI, no CAT scan, no X-ray. No one even bothered looking at my head. Everyone was focused on my eyes.

Mr. SPACE. And they were obviously aware that you had been subjected to a blast and were having vision problems throughout that entire period. A deteriorating condition, no less, correct?

Petty Officer MINNEY. Yes.

Mr. SPACE. Do you have any idea as to why no one thought of doing an MRI prior to 2006?

Petty Officer MINNEY. No, I do not. I just think that they were just focused on the eyes and they did not want to think outside the box and think that maybe there was a brain injury that was related to the eyes. They did not put two and two together.

Mr. SPACE. Alright. Do you think cost might have been a factor?

Petty Officer MINNEY. I do not know.

Mr. SPACE. Okay. Had the Department of Defense diagnosed TBI, let us say within 6 weeks or a month or a week after your injury, would that have had an affect on your condition or made a difference in your prognosis for recovery?

Petty Officer MINNEY. It may have made a difference in my recovery. I could have started my speech therapy sooner. I could have started my cognitive therapy sooner.

Mr. SPACE. So you were delayed essentially for 10 or 11 months in all that?

Petty Officer MINNEY. Yes.

Mr. SPACE. Apart from the eye conditions that you suffer from, did the brain injury manifest itself in any other ways?

Petty Officer MINNEY. Yes. I have cognitive thinking disorder. I have short-term memory loss. There are things that happened before my injury in my life that I do not remember now. And I have some associative disorders that I have to go through speech therapy with. I can be speaking and sometimes forget the next word. So I am going through therapy to help me learn to speak and basically to think all over again in a different way.

Mr. SPACE. I thank you again, Mr. Minney for your testimony.

Dr. Zampieri, I have one or two brief questions for you. What can the VA do better, or the Department of Defense for that matter, in tracking or effectively screening and/or diagnosing TBI and/or ophthalmological conditions that might not otherwise be readily apparent from a visual inspection?

Dr. ZAMPIERI. Thank you. I guess sort of the gold standard that I have really been impressed with is what is going on at Palo Alto. They are just doing some exceptionally great screening out there. And, you know, I guess if I were to wave the magic wand and be up in a high enough level in DoD of VA I would say, okay, we need to replicate the types of optometry/ophthalmology/blind rehabilitative specialist that are at Palo Alto that are working and screening all these TBI patients at least initially through all of the VA Polytrauma Centers.

Mr. SPACE. Would the implementation of the Military Eye Trauma Center of Excellence that you referred to in your testimony be of assistance in that regard?

Dr. ZAMPIERI. Yes, it would be huge.

Mr. SPACE. Okay.

Dr. ZAMPIERI. Because, you know, I think most people envision that the Eye Trauma Center of Excellence would be sort of the lead coordinator of this and make sure that people like Angie and Glenn Minney's wife, Gretchen, that they get information. Again families need to have information about where in the VA they can get help and assistance. The Eye Trauma Center of Excellence should not

be viewed though is like all patients with eye injuries are going to go to one place.

Mr. SPACE. Right.

Dr. ZAMPIERI. But it should be, you know, I mean, they are setting up the TBI Center of Excellence and the PTSD Centers of Excellence to facilitate and coordinate those injuries and someone telling me, well we will send them to the eye clinic for the eye part. No.

Mr. SPACE. Right. And I have exceeded my time, but I just, with the consent of the Chairman, would like to ask one additional question?

Thank you, Mr. Chairman. Is there, in your opinion, one specific factor that you can point to that represents a barrier to the establishment or the implementation of that Center of Excellence?

Dr. ZAMPIERI. I hate to say this, you know, because you fund the VA a huge amount and you funded DoD a large amount but I have been sort of told that well the \$5 million wasn't included to cover the Military Eye Trauma Center of Excellence, therefore, we are going to set up a computer registry which is an important part of this. And there are actually DoD and VA ophthalmologists and optometrists that are working from a clinical standpoint to develop the computer registry. But that is not the end of this. I mean, these guys will tell you, I am not a number in the computer registry with a diagnoses and peripheral field measurements and a surgical op note, you know or whatever other various things that are in that registry which is important. But these other things. The research and the best practices and the continuing education of the other providers.

So I am just stunned when I am told, well Congress did not include the \$5 million so, therefore, we are not going to implement this but we will set up the computer part. No. And I am embarrassed to have to ask, well could you guys put the \$5 million in somewhere. I just cannot believe I am even saying that in front of you. It is terrible.

Mr. SPACE. I appreciate your candor. Thank you Doctor, thank you Mr. Minney and Sergeant Pearce.

Mr. MITCHELL. I thank you. Mr. Boozman.

Mr. BOOZMAN. Thank you, Mr. Chairman. I am an optometrist, an eye doctor, and I have dealt with low-vision patients, people that had impaired vision for a long time. I actually set up the low-vision clinic at the Blind School in Arkansas. The very first one, so I really do have a lot of experience in that regard.

I can say that what you all went through early on, being somebody that treats folks in that—I am not a surgeon, but again being in a position of trying to figure out what is going on. I think with the literature that was available there, our experience that is available you could almost look at your care and understand what was going on. Now, there is a difference because of the fact that we do now understand exactly what we did not understand exactly then. But we understand that there is a mechanism associated with TBI that very much effects vision and because of the prevalence of TBI this is something that, you know, we have to pursue. As a result, we were able to work with most of the Committee and several others. Dr. Zampieri has been wonderful in helping us establish the

Department of Defense Excellence—the Center, you know, what we have been talking about. The problem again is funding. And so the law is in place. I really, you know, I appreciate your testimony.

Sergeant Pearce, your six things that we need to do, you know, this does that. Okay. Exactly, and a lot of other things. You know, we need to follow up and get you guys fixed up. I am not real upset that what happened to you happened in the way it did in the sense that, you know, generally recognized things were practiced. Where I am going to be very upset is the guys that this happened to since this law has passed. And as Dr. Zampieri referred to, it has not been funded and is not being done then that is where we are going to get upset. There is no excuse now. Again, based on what we have learned from you guys there is no excuse now not to follow up on that. And this particular law actually came from the ophthalmologists and optometrists that are out there fighting the battle. They came to us and said, look, we need to do this. And so I really do appreciate your testimony. Hopefully at this point, you know, we will go forward and make sure that individuals that have run through the same problem because of the fact that we have identified the problems that you have had now that we can forward and then also continue to get the treatment that you need.

Let me ask one thing and you might address this Dr. Zampieri. There is a little bit—in the testimony we learned that there is a discrepancy in the different Polytrauma Centers as far as what they have available to treat eye injuries. Can you address that? Is that acceptable in the sense that we are better off kind of clustering folks that need the intensive low-vision treatments or this or that or do we need to have the same care at every center? Does that make sense? In other words, Richmond did not offer one thing. Should all of these be offering the same thing or are we better off having this specialized at some centers versus the others?

Dr. ZAMPIERI. Yes. I guess again the model—and to be fair Palo Alto had the infrastructure because they had the Blind Center there. So they did have additional staff that the other three VA Polytrauma Centers would not normally have. And they were able to draw upon some of that expertise from their Blind Center staff and this TBI screening program. But I think that the important take home message for some folks is that the—when you look at the Wounded Warrior legislation, in fact, it was almost like they had a list of all the occupations that are vital for the TBI Polytrauma Centers, and then the—I remember looking at the Senate legislation and I was astounded because down at the bottom it says, the Polytrauma directors, I am paraphrasing here, can assign other occupations as needed and they mentioned ophthalmology and optometry and I forget who else. But up at the top of the list of the major people who have to be involved they got recreation therapy, of course the physical therapy and the occupational therapy and those were—everybody is important. Ha. But excuse me, if 70 percent of my sensory awareness is from my vision, and you are supposed to be the centers of excellence for Polytrauma and TBI, the first person I want making rounds everyday on the team, is an ophthalmologist and an optometrist with low-vision credentials. And to be told again, well, they are a part of the team but they are over there. Well, I got news, I can get real mad today.

There are neurology clinics, too. I worked in the VA for 19 years. That is why I think I irritate people because I have healthcare experience too. And sure, there are physical therapy clinics in every VA hospital, so why do you have to have them inside the poly-trauma team. There are dietitians in every hospital. So do not—no. That game stops today. Either it is a multi-disciplinary team approach or it is not. And you do not put others as assigned. Not for this. Both of these gentlemen can tell you that when you lose 98 percent of your vision, your life is changed forever.

The employment figures and this is not an employment hearing, but nationally the employment rate for blind individuals is 32 percent and that has not changed in 10 years. And that should be an astounding thing to consider what these individuals are up against. And if nothing else from that perspective alone, we have a long way to go and so I appreciate it. I am sorry I get angry.

Mr. BOOZMAN. No, that is okay. Thank you very much. I think that is very, very well said.

Mr. MITCHELL. Thank you. Mr. Walz.

Mr. WALZ. Well thank you, Mr. Chairman and thank you to our witnesses, Staff Sergeant Pearce and Mr. Minney. First of all thank you for serving this Nation and doing it with great dignity. As representatives of the American people our job is to make sure we serve you with that same dignity and professionalism, and I can tell you my constituents want us to get this right. So I thank you for being there.

Ms. Pearce, I will not for a minute allow anyone to forget that our warriors do not fight alone. Their families fight with them and your care now is going to forever change your life. It is going to change your career trajectory. It is going to change a lot of those things and the realization that needs to come out of Congress, and it needs to come out that the American people want to make sure that you are fully cared for too and that you are made as whole as possible. Doing these things is not winning the lottery. There is a moral responsibility that this Nation has to provide and it also sends a message to future generations who wish to serve this Nation that when you come back you are not going to fight us and have to come here. So Dr. Zampieri, I totally agree with you. The idea that you would come here and bring these warriors with you, and have to beg for money to fund this. The juxtaposition against yesterday having oil company executives here and them telling us the \$18.6 billion we gave them needs to continue on and you not getting your \$5 million. If that escapes anyone in this country, shame on them.

Just a couple of things that I would like to say. I can say, Chairman Mitchell and this Subcommittee and having Dr. Boozman on here as an expert is critically important and I am very appreciative of that. This understanding, and I think you have all hit this very clearly, and I think it is a sense of optimism but also a frustration on this issue of communications, electronic medical records, and the ability to disseminate that across DoD into the VA.

We went to Iraq and Afghanistan in January with the specific purpose of taking a look at trying to break the stovepipes down and get them to communicate. One thing I have been expressing in my district and I want to thank BVA for bringing this forward. It was

the BVA, I think, that turned us on to the traumatic brain injury and I think Ms. Pearce and others have talked about this. We need to be careful about a signature injury. Every injury is an injury to a warrior and is equally important to service. And if we lose track of that understanding we are going to rob Peter to pay Paul without making our military and our warriors whole. So we went there looking at this issue and one of the things I am deeply concerned about and I am glad that you brought this up is, I can anticipate already now we have an Agent Orange scenario on our hands. I have talked to warriors over there who have gotten blown up five times. They say, yeah, I got blown up five times. I got up and dusted myself off. They are going to come in 5 years, maybe 10, maybe shorter, maybe longer and they are going to go to the VA and they are going to complain of vision. And they are going to complain of memory lapses and all that. And then they are going to be asked, "what happened to you?" Well, I was blown up near Baghdad. "Prove it." And we have the electronic medical record to be able to record these and with the work that has been done on this, the serial injuries, especially—it seems like an oxymoron, but the mild traumatic brain injuries that are happening are leading to this and I do not know why we are not taking—I think we are moving forward on that, we are trying to take the initiative. We have the technology. We have the ability to do this. Now we need the political will and the expertise to put that into play.

So a couple of things I would ask on this. Mr. Minney, was your blast recorded on your record or was it going in to be seen about the eye? I mean, did your medical record the blast as being significant in this?

Petty Officer MINNEY. Yes.

Mr. WALZ. Okay. So it was on there?

Petty Officer MINNEY. Yes.

Mr. WALZ. Okay. But thank goodness you had it and you carried it through.

Petty Officer MINNEY. Yes.

Mr. WALZ. So we had it there. All right. Very good. The other thing, and I guess that this is one that I would go back to—well no I will leave it at that. I'm with Dr. Zampieri, I do not want to get angry about this one because I understand and I can tell you—the only thing I guess I would tell you on this is that the commitment is here, the will of the electorate who put me here is here to do this right, the expertise is out there to be able to this, the council is there, and yet here you are today asking for us to try and improve this. So I would first of all applaud you for coming here. This is critically important that you do that. We are not going to forget for a minute. Your suggestions are based upon personal experience, but they are also based on when researchers are looking on this they come to the same conclusion right where you are at.

So it is aligning there. I am optimistic that we have started to move toward as Dr. Boozman alluded to. There were things that are going right but there is more that needs to be done and our commitment needs to be with you. So again thank you for that and thanks for your service. I yield back.

Mr. MITCHELL. Thank you. Ms. Brown.

Ms. BROWN OF FLORIDA. Mr. Chairman, I don't have any questions, I just want to thank the men and the wife, the spouse, for their service to the country, and you can rest assured that I will be supporting the Subcommittee in whatever they recommend. I think it is just crucial that we do not forget the people that we sent forth, whether we supported the war or not, it is our duty to make sure that the men and women have what they need and when they come back that they are taken care of.

So you have my commitment on that. Thank you.

Mr. MITCHELL. And thank you very much for your service and your testimony has been terrific and we hope as a result of this you will see some changes. Thank you very much.

If the second panel would come forward. We are scheduled to have votes fairly soon but each of the three people here representing the next panel will have 2 minutes apiece to make their presentations.

The first person that I want to recognize is Congresswoman Corinne Brown who is here to introduce her constituents NovaVision.

As soon as all three take their place we will begin. And again please keep your remarks to 2 minutes.

OPENING STATEMENT OF HON. CORRINE BROWN

Ms. BROWN OF FLORIDA. Thank you, Mr. Chairman. And you know we know how to do 1 minutes in the House of Representatives.

[Laughter.]

Mr. Chairman and Members of the Subcommittee, I am pleased to introduce NovaVision today for their testimony regarding TBI and vision.

NovaVision, which is headquartered in Florida, develop and provide innovative medical devices and a wide range of solutions to restore the vision of patients. They have developed a therapeutic base on the brain's ability to adopt and form new connections to compensate for injuries.

Dr. Marshal will elaborate further on this therapy. Dr. Randolph S. Marshall is Professor of Clinical Neurology at Columbia University and the Director of the Stroke and Critical Care Division in the Department of Neurology.

He obtained his undergraduate degree from Harvard University and his medical degree from the University of California.

His clinical work focuses on the treatment and prevention of stroke and related disorders. He has a research program that investigates stroke recovery. He is accompanied by Mr. Mehta.

Mr. Mehta has 15 years of experience in managing technology companies. He cofounded NovaVision in 2002, guiding the company through the Food and Drug Administration clearance of his vision restoration therapy. He is also a certified public accountant in the State of New York. I yield back the balance of my time.

[The prepared statement of Congresswoman Brown appears on p. 44.]

Mr. MITCHELL. Thank you. Mary Warren is here on behalf of Performance Enterprises and Dynavision 2000. And Gayle Clarke is the Chief Executive Officer of Neuro Vision. All of these compa-

nies are currently working to improve rehabilitation services for blinded veterans as a result of TBI and are here to discuss the use of treatment methodologies.

First Dr. Marshall and then Ms. Warren and Ms. Clarke will have 2 minutes apiece. Thank you.

STATEMENTS OF RANDOLPH S. MARSHALL, M.D., M.S., ASSOCIATE PROFESSOR OF CLINICAL NEUROLOGY, AND CHIEF, DIVISION OF CEREBROVASCULAR DISEASES, AND PROGRAM DIRECTOR, VASCULAR NEUROLOGY FELLOWSHIP TRAINING PROGRAM, THE NEUROLOGICAL INSTITUTE, COLUMBIA-PRESBYTERIAN MEDICAL CENTER, NEW YORK, NY, ON BEHALF OF NOVAVISION, INC.; ACCOMPANIED BY NAVROZE S. MEHTA, PRESIDENT AND CHIEF EXECUTIVE OFFICER, NOVAVISION, INC., BOCA RATON, FL; MARY WARREN, M.S., OTR/L, SCLV, FAOTA, ASSOCIATE PROFESSOR OF OCCUPATIONAL THERAPY, AND, DIRECTOR, GRADUATE CERTIFICATION IN LOW VISION REHABILITATION PROGRAM, UNIVERSITY OF ALABAMA AT BIRMINGHAM, SCHOOL OF HEALTH PROFESSIONS, ON BEHALF OF PERFORMANCE ENTERPRISES AND DYNAVISON 2000, ONTARIO, CANADA; AND GAYLE CLARKE, CHIEF EXECUTIVE OFFICER, NEURO VISION TECHNOLOGY PTY. LTD., TORRENSVILLE, AUSTRALIA

STATEMENT OF RANDOLPH S. MARSHALL, M.D., M.S.

Dr. MARSHALL. Ranking Member Brown-Waite and other Members of the Subcommittee.

I commend the Subcommittee for holding a hearing on this incredibly important topic and commend Representative Brown for showing tremendous leadership in this and other issues effecting the veterans. Thank you very much for allowing me to testify.

As mentioned, I am a Professor of Neurology and Chief of the Stroke Division at Columbia University in New York. I conduct research in the area of recovery after brain injury and see patients in that capacity as well. The science of brain reorganization and neuroplasticity is one the hottest fields in medicine right now.

One of the most interesting components of this field is the training and rehabilitation of partial visual loss. Since 2003, the NovaVision Company has been offering an exciting new option for treating partial visual loss after brain injury. It is known as visual restoration therapy or VRT.

There are now over 40 centers across the U.S. offering the therapy, including clinics in Scottsdale, Arizona, Clearwater, Florida, Cincinnati Eye Institute, and Sharp Memorial Hospital in San Diego, California.

Columbia, where I practice was the fourth site to begin treating brain injured patients using VRT. One of the most memorable patients for me was Bart Goldstein, who was featured in a recent NBC Nightly News story.

Bart was a 19-year-old young man who had suffered a devastating motor vehicle accident 3 years before. He underwent VRT and not only regained some of his lost vision, but improved his attentional capacity as well. He was able to leave home and live independently and begin a school program.

Bart is similar to the wounded soldiers we heard from in having a closed head injury. As we heard in previous testimony, both visual loss and additional neurological deficits, such as attention, are common in this condition.

Mr. Chairman, finally with respect to the veteran population, NovaVision has donated five devices to treat veterans in the Tampa VA Polytrauma Center. The first of these veterans are now being treated.

I am confident that VRT will be a very important adjunct to the rehabilitation treatment that we can offer these veterans. Thank you, very much.

[The prepared statement of Dr. Marshall appears on p. 55.]

Mr. MITCHELL. Thank you. Ms. Warren.

STATEMENT OF MARY WARREN, MS, OTRL, SCLV, FAOTA

Ms. WARREN. I thank you for allowing me to provide this testimony in favor of the Dynavision.

I am an Associate Professor at the University of Alabama at Birmingham and an occupational therapist. I have worked for 30 years in clinical practice with persons who have traumatic brain injuries with their visual issues and I'm very glad to see this Committee addressing those issues. Twenty years of that time I have used the Dynavision as an apparatus to help individuals learn to use their remaining vision more efficiently. It is a very dynamic piece of equipment. It is very versatile and flexible and allows us to do a lot of different programs for our clients. It is a piece of athletic equipment that we have modified and used for persons with brain injuries and because of that it is a very competitive device and works particularly well with young men who have a competitive nature, who want to do an athletic activity and it is a very good device in drawing out their ability to use their remaining vision more efficiently.

I guess I can be very brief.

[The prepared statement of Ms. Warren appears on p. 56.]

Mr. MITCHELL. Very good, thank you. Ms. Clarke.

STATEMENT OF GAYLE CLARKE

Ms. CLARKE. Chairman Mitchell, Ranking Member Brown-Waite, and Members of Subcommittee Neuro Vision Technology would like to thank you sincerely for being asked to present today. There is a few brief points that I would like to make which Dr. Zampieri has already mentioned.

Historically worldwide traumatic brain injury rehabilitation programs include, physiotherapy, occupation therapy, and speech therapy. About the incidents of speech deficits in traumatic brain injury is the same as that as vision deficit. So why is vision therapy not part of the interdisciplinary rehabilitation program that is applied in acute settings and rehabilitation settings. There is a definite need for early intervention and I was distressed to hear that patients and your veterans here today were being told that vision is not important in their early intervention.

In Australia for 20 years, we have been working with patients from day two following trauma and implementing vision therapy programs. It is awful to hear that there is a real issue and research

has stated that 50 percent of people that already have been admitted to hospital go undiagnosed with vision-related deficits. These people can be 5 years, 10 years out and still be undiagnosed with vision deficit problems that are occurring. And this should not happen to your veterans.

Blind Rehabilitation Centers are designed to provide veterans with programs that are for ocular disorders such as glaucoma, macular degeneration. Most staff have minimal understanding of additional cognitive and physical deficits associated to traumatic brain injury. The complexities of injuries, in addition to vision loss, make these cases very challenging for vision rehabilitation programs. Staff need to understand the difference and be trained in the different programs for neurological vision impairment intervention.

Vision therapy is totally different for this group of veterans. They have to think brain and not eyeball. And that is again what we have heard today.

Validation in the form of clinical research trials are essential and time and money needs to be allocated. However there is an existing need now. These veterans do not deserve to wait for 3 and 5 years for research to come out.

Research programs should be conducted but in conjunction with implementing of proven therapy programs. Neuro Vision Rehabilitation System that we provide at NVT is not just a device but a staff training and therapy intervention program that actively transfers skills into functional tasks such as mobility and ADL. It is based on assessment and training programs which have been successfully implemented in Australia since the early 1980s.

I spent 25 years of my life, sir, as a clinician. My key motivator is improving patient quality of life. And as such I believe—

Mr. MITCHELL. Could you wrap it up, please?

Ms. CLARKE [continuing]. And as such I believe passionately that comprehensive commitment to vision therapy programs such as NovaVision, Dynavision and NVT needs to be provided.

I thank you sincerely for the opportunity to present today.

[The prepared statement of Ms. Clarke appears on p. 59.]

Mr. MITCHELL. Thank you. I have one question for all of you and that is, the technologies that you represent, can they help identify servicemembers that are suffering with vision issues or do they only help servicemembers once they have been identified as having vision problems?

Ms. CLARKE. The NVT Program is an assessment and training program. We assess for vision loss. We assess for visual processing, visual spatial, and for visual orientation.

So for patients who have difficulty in understanding the spatial concepts around them, we can work with them from day one.

Ms. WARREN. The Dynavision is primarily a training tool, but in the hands of good clinician, often times we uncover visual processing deficits that were not seen by our referring physicians. So the answer is primarily, no, but there is some evaluation component to it.

Dr. MARSHALL. The NovaVision technology is specifically designed to begin with an assessment of the visual field loss that then leads to a targeted therapy.

The first step is a mapping of the visual fields. There is both a comprehensive map that is done by a clinician when there is a problem known, but the NovaVision Company also has a screening module that is a more rapid assessment.

Mr. MITCHELL. Ms. Brown-Waite.

Ms. BROWN-WAITE. Thank you very much, Mr. Chairman. I certainly want to thank you for the donation to the Tampa Hospital, the TBI Unit. They do a great job there. Dr. Scott is, I think, one of my heroes and every time I go there I pretty much hear the same thing from the servicemen who are there and their families.

Ms. Warren, what is the typical process that an individual goes through when they are referred to your services?

Ms. WARREN. Well they are referred generally by a another physician, so we have an identified diagnosis. And our real responsibility is to ensure that they can engage in whatever activity they would like to engage in again. So it can be work, leisure, home-making activities, whatever they need to do. We use the Dynavision to increase the efficiency of their vision so that they can use their remaining vision more effectively those activities.

Ms. BROWN-WAITE. And how extensively do you work with the VA in rehabilitating servicemembers?

Ms. WARREN. I do not work with the VA. I am not an employee of the VA, nor have I worked with them. I have worked in clinical practice in various facilities and now I am at the university and in a clinical practice there, so I do not have experience with the VA but I have a lot of experience working with persons with brain injury.

Ms. BROWN-WAITE. So is some of the research that you are doing being shared out there?

Ms. WARREN. All of the research that has been done on the Dynavision has been in publication for quite a while now since the device has been around for so long. So it is available to whoever uses it. I do a lot of training of occupational therapist including therapist who work for the VA in order to help them understand how to provide visual rehab for persons with brain injuries.

Ms. BROWN-WAITE. Thank you very much, Mr. Chairman. As you can tell by the buzzer we are being called for a vote, so I'll yield back the balance of my time.

Mr. MITCHELL. Thank you. Let me just ask. Are there any questions that any of the rest of the Members would like to ask our panelists here before we dismiss them and then we will come back?

Mr. SPACE. I would like to ask one question.

Mr. MITCHELL. Okay. Go ahead.

Mr. SPACE. Thank you, Mr. Chairman. This is for Mr. Marshall. I am curious as to the effect of delayed diagnosis and, for example, the case of one of the gentlemen that testified today, there was a 10-month lapse of time before a diagnosis of TBI had been made. Up to that point, they suspected pinkeye which to me is somewhat inconceivable given that there are other manifestations of the injury. Is a prolonged period prior to diagnosis something that can affect a patient's prognosis for recovery and are there other effects of failure to properly and promptly diagnosis?

Dr. MARSHALL. That is a very interesting question. I will leave aside the question of the misdiagnosis. But as far as treatment

goes most of the patients treated with VRT have been treated in the chronic phase after 3 to 6 months after injury because of the fact that there are some spontaneous improvement and we wanted to make sure, at least in the early going that we were making an effect that was independent of spontaneous improvement. That being said there is a lot of interesting information coming out in other areas of brain recovery in other modalities. Motor recovery, language and so on that suggests that there is an early time period in which the brain may be actually more amenable to rehabilitation, retraining and that there is an early time period that may actually be more effective. Actually there is a study being purposed at the moment to try more acute therapy and it is something that we have been very interested in.

Mr. SPACE. And would you be willing to provide us with copies of the results of that study upon completion?

Dr. MARSHALL. Of course.

Mr. SPACE. Thank you, Doctor.

Mr. MITCHELL. Thank you.

Ms. BROWN-WAITE. Mr. Chairman, depending on how long the votes go, I may or may not be able to be back for the third panel, so I would ask if Mr. Art Wu could be in my place if there is not another Member here?

Mr. MITCHELL. So ordered. Yes.

Ms. BROWN-WAITE. Thank you.

Mr. MITCHELL. Mr. Boozman.

Mr. BOOZMAN. Thank you. Very quickly. You said that the device had been around for a long time, do you have a controlled peer review study that compares this method of treatment with other methods in relation to TBI?

Ms. WARREN. What was the question?

Dr. MARSHALL. I'm sorry, who are you addressing?

Mr. BOOZMAN. I do not care, whoever knows the answer.

Mr. MEHTA. Yeah, the NovaVision study and Dr. Marshall could add to this has been peer reviewed and there have been many double-blind placebo controlled studies.

Mr. BOOZMAN. In regard to TBI?

Mr. MEHTA. And with regards to both traumatic brain injury and TBI.

Mr. BOOZMAN. And the studies say that this is much more effective or the same? What do the studies say that have been—

Dr. MARSHALL. The seminal study that was done for the VRT technology was published in the Nature Neuroscience in 1998 and compared a fixation training with this VRT technique. It has not been, as far as I know, specifically tested against other types, for example psychotic training and others. However most likely, the best results are going to result from a combination of therapies. The one VRT addresses a restorative neuroplasticity based treatment. And as was mentioned here, some of the others address a compensatory mechanism for overcoming the deficits that are in existence.

Mr. BOOZMAN. Okay. Do any of you all have financial interest in the company?

Ms. WARREN. No.

Dr. MARSHALL. I have none.

Ms. CLARKE. I do.

Mr. MEHTA. I do.

Mr. BOOZMAN. Okay. And how long have you two, Ms. Warren and Dr. Marshall, how long have you all used the equipment and are familiar with it?

Ms. WARREN. I have used the Dynavision for 20 years. I was actually the first occupational therapist to see a Dynavision. Because it is a part of sports training I saw it and realized that it was an apparatus that I could use with my clients who had vision problems, particularly those who had hemianopsia and in attention. So I brought it into rehab and over the years a lot of other therapist have adopted it is use as well because we find it to be a useful tool in our arsenal when we are trying to assist a person to use their vision more effectively.

So it is not the only—we talk about the fact that we use a variety of different therapies to achieve our goals and this is just one tool that helps us.

Mr. BOOZMAN. Good. And that's the other reason that going ahead with funding of our Vision of Excellence Center. These are the kinds of questions that we need to be asking and need to be answered based on good studies and things. And certainly a 1998 study is one thing, but now we are into 2008 and a lot has happened, intervened in that in regard to TBI and our knowledge of it and what we are doing now compared to then so, thank you very much.

Mr. MITCHELL. Thank you. And I want to dismiss the second panel and not adjourn, but to recess this hearing for the third panel until right after the votes. It should be, maybe, 15 or 20 minutes and we will continue with that panel at that time. Thank you.

[Recess.]

Mr. MITCHELL. Thank you. The hearing will reconvene and I want to welcome panel three to our witness table.

Dr. James Orcutt, and Dr. Barbara Sigford are here to testify on behalf of the Veterans Health Administration. Dr. Cockerham and Dr. Goodrich are here to discuss the new research they are conducting at the VA's Western Blind Rehabilitation Center in Palo Alto. And Colonel Loree Sutton is the Director of DoD's Center for Excellence for Psychological Health and Traumatic Brain Injury.

At this time we would like to recognize Dr. Orcutt, and then Dr. Cockerham and then Colonel Sutton for 5 minutes each.

STATEMENTS OF JAMES ORCUTT, M.D., CHIEF OF OPHTHALMOLOGY, OFFICE OF PATIENT CARE SERVICES, VETERANS HEALTH ADMINISTRATION, U.S. DEPARTMENT OF VETERANS AFFAIRS; ACCOMPANIED BY BARBARA SIGFORD, M.D., PH.D., NATIONAL PROGRAM DIRECTOR FOR PHYSICAL MEDICINE AND REHABILITATION, VETERANS HEALTH ADMINISTRATION, U.S. DEPARTMENT OF VETERANS AFFAIRS; GLENN COCKERHAM, M.D., CHIEF OF OPHTHALMOLOGY, VETERANS AFFAIRS PALO ALTO HEALTH CARE SYSTEM, VETERANS HEALTH ADMINISTRATION, U.S. DEPARTMENT OF VETERANS AFFAIRS; ACCOMPANIED BY GREGORY L. GOODRICH, PH.D., SUPERVISORY RESEARCH PSYCHOLOGIST AND COORDINATOR, OPTOMETRY RESEARCH FELLOWSHIP PROGRAM, VETERANS AFFAIRS PALO ALTO HEALTH CARE SYSTEM, VETERANS HEALTH ADMINISTRATION, U.S. DEPARTMENT OF VETERANS AFFAIRS; COLONEL (P) LOREE K. SUTTON, M.D., USA, SPECIAL ASSISTANT TO THE ASSISTANT SECRETARY OF DEFENSE (HEALTH AFFAIRS), PSYCHOLOGICAL HEALTH AND TRAUMATIC BRAIN INJURY, AND DIRECTOR, DEPARTMENT OF DEFENSE CENTER OF EXCELLENCE FOR PSYCHOLOGICAL HEALTH AND TRAUMATIC BRAIN INJURY, DEPARTMENT OF THE ARMY, U.S. DEPARTMENT OF DEFENSE; AND MAJOR GENERAL GALE S. POLLOCK, DEPUTY SURGEON GENERAL FOR FORCE MANAGEMENT, AND CHIEF, UNITED STATES ARMY NURSE CORPS, DEPARTMENT OF THE ARMY, U.S. DEPARTMENT OF DEFENSE

STATEMENT OF JAMES ORCUTT, M.D.

Dr. ORCUTT. Good morning Mr. Chairman and Subcommittee Members. I also wanted to acknowledge the testimony of the veterans previously and I also wanted to praise their service to our country, after all that is really why we are here is to provide the highest quality and safest care to our veterans.

I also want to thank you for the opportunity to discuss the Department of Veterans Affairs provision of care for veterans needing support for visual impairment and traumatic brain injury.

I am joined by Dr. Barbara Sigford, and I will be doing the oral presentation for the both of us. She is the National Program Director for Physical Medicine and Rehabilitation and I would also request that a written statement be placed into the record.

The Veterans Health Administration has developed one of the most extensive rehabilitation programs and systems in the country for visual impairment, and our work in treating TBI, dating back to the creation of four National TBI centers in 1992, is unmatched. Our Polytrauma System of Care is uniquely positioned to address the complex needs of veterans and servicemembers exhibiting these two conditions, and others, simultaneously. My testimony today will provide an overview of the continuum of care VA provides veterans and servicemembers to ensure they receive the right care, in the right way, at the right time, to further their goals of rehabilitation and reintegration.

I would like to begin by noting that VA is aware of the preliminary work being done in Palo Alto. And we are interested in all efforts to expand our understanding of TBI related visual impairment.

We must stress, however, that this data is from a small select population. Sampling in a larger cohort with scientific scrutiny must demonstrate the same results before a system wide changes would occur.

Future research would include pre-injury data on visual functioning and longitudinal analysis to determine if conditions improve naturally over time. We want to be certain that any changes in our care are to the benefit of our veterans and reflect the best scientific evidence available.

The VA continually reviews and improves our care for these wounded and injured warriors. In the area of visual impairment the VA hosted a conference in December of 2007 with the Department of Defense on the visual consequences of traumatic brain injury. This conference was attended by members of the visual team for each Polytrauma Rehabilitation Center as well as blind rehabilitation specialists, optometrists, and ophthalmologists from both departments and provided an opportunity to initiate a consensus validation process.

This validation process will identify and disseminate the most effective strategies for treatment when they are known or to determine where our additional research is needed.

The VA has also assembled teams of specialist to develop questions for determining evidence based treatments. We anticipate this process will be complete in the summer.

The VA holds an annual conference, portions of which are jointly conducted with the Blinded Americans of America who are experts and BVA representatives can discuss new treatment methods and further areas of cooperation.

The VA has developed several initiatives to facilitate the ease of transfer for veterans and servicemembers transitioning from the military service in Operation Enduring Freedom and Operation Iraqi Freedom.

For example blind rehabilitation service involvement often begins when the injured servicemember is still a patient at a military treatment facility. The patient is transferred to a VA Blind Rehabilitation Center as soon as it is medically indicated, and at the patient's request. There is no waiting time for these OEF or OIF patients in Blind Rehabilitation.

VA's four regional Polytrauma Rehabilitation Centers provide the most intensive specialized care and comprehensive rehab available for combat injured patients transferred from military treatment facilities. As veterans recover and transition closer to their homes the polytrauma system of care provides a continuum of integrated care to 21 polytrauma network sites and 76 polytrauma support clinic teams. Any OEF/OIF veterans seen at a VA medical facility is automatically screened for TBI with a 22-item checklist. Veterans for whom the screen is positive are referred for a full, in-depth evaluation. The evaluation process includes a standardized evaluation template for common problems following brain injury. This template includes checks for visual impairment. Our visual treatment specialists conduct comprehensive visual examinations for findings associated for blast injuries, including but not limited to, visual acuity, visual field testing, pressures within the eye, imaging

of both the retina and the cornea to assess damage to these structures and abnormalities of eye movements.

Currently, 164 Visual Impairment Service Team coordinators provide lifetime case management for all legally blind veterans, and all OEF/OIF patients with visual impairments. Additionally, 38 Blind Rehabilitation Outpatient Specialists provide blind rehabilitation training to patients who are unable to travel to a blind center.

Each Polytrauma Rehab Center and Polytrauma Network site has dedicated funding for a Blind Rehabilitation Outpatient Specialist on the Polytrauma team.

I want to thank you again for the opportunity to meet with you today and that ends my remarks and I would be happy to answer questions at the appropriate time.

[The prepared statement of Dr. Orcutt appears on p. 64.]

Mr. MITCHELL. Thank you very much.

Dr. Cockerham.

STATEMENT OF GLENN COCKERHAM, M.D.

Dr. COCKERHAM. Chairman Mitchell, Ranking Member Brown-Waite, and Members of the Subcommittee, thank you for this opportunity to testify. I am accompanied today by my colleague, Dr. Gregory Goodrich, Research Psychologist and Coordinator of the Optometry Research Fellowship Program at the Western Blind Rehabilitation Center in Palo Alto California.

We are here today to discuss our research on vision issues and traumatic brain injury. This research was conducted at the Palo Alto Polytrauma Rehabilitation Center and Polytrauma Network Site on samples of just over 100 patients, including both veterans and active duty servicemembers. A common injury of Operation Enduring Freedom/Operation Iraqi Freedom veterans with polytrauma is traumatic brain injury caused by explosive devices. The precise incidence of eye injuries and visual disability occurring in operation OIF and OEF is currently unknown.

The VA's Polytrauma Rehabilitation Centers recognize the importance of early intervention for visual impairment and structured interdisciplinary teams to include blind rehabilitation specialists. In addition neuro-ophthalmology was identified as a key consultative service.

All Polytrauma Rehabilitation Centers conduct eye examinations on their patients as needed. Dr. Goodrich and I began studying this area after noticing abnormalities in visual function as well as ocular injuries despite normal or near normal visual acuity. Our research seeks to determine if this patient population is typical of other veterans and servicemembers with polytrauma.

Before continuing I must note that this is preliminary research and much more work needs to be done to determine conclusively the risks for this population.

Our research is focused on two groups. First, veterans and servicemembers receiving inpatient care at the Palo Alto Polytrauma Rehabilitation who have sustained visual impairments associated with life threatening polytrauma injuries. And second, outpatients receiving care at the Palo Alto PNS who have visual dysfunctions associated with mild traumatic brain injury. While the

inpatient and outpatient groups may seem far apart in terms of the severity of their injuries, they do share two common factors: the most common cause of injury in both groups is a blast event, and both groups have sustained a traumatic brain injury, of varying levels of severity. Our preliminary research suggests both groups may have increased rates of visual impairment or dysfunction.

Among the Palo Alto polytrauma patients with moderate to severe traumatic brain injuries studied, those with injuries stemming from a blast event were about twice as likely to have a severe vision impairment, including blindness, as were those whose injuries were caused by all other events.

In my research looking specifically at veterans in the Polytrauma Rehabilitation Center with traumatic brain injury caused by combat blast, abnormalities in visual field and contrast sensitivity were discovered in some patients despite normal or near normal visual acuity by conventional testing. Eye examinations by ophthalmologists and neuro-ophthalmologists detected damage to vital eye structures including cornea, retina, and optic nerve that could result in visual loss in the future.

In other patients in this population, problems such as double vision, inability to track moving objects effectively or to focus normally were present. The long-term significance of these findings is not known.

In conclusion, I wish to emphasize that our testimony is based upon findings from early studies with relatively small and selected population samples. This data is not definitive and conclusions should not be drawn from it. The need for additional study is recognized. Our preliminary data has allowed us to obtain funding from VA to enlarge our study group, to develop a comparison group, and to determine the natural history of our findings over time.

Understanding these visual injuries and developing an evidence base for treatment has involved a collaborative effort utilizing the expertise and resources of many disciplines. VA's experience with vision related injury and impairment supports the claim that many of these patients can be effectively treated.

Thank you again, Mr. Chairman, for inviting us today. That concludes my oral testimony.

[The prepared statement of Dr. Cockerham appears on p. 67.]

Mr. MITCHELL. Thank you.

Colonel Sutton.

STATEMENT OF COLONEL (P) LOREE K. SUTTON, M.D., USA

Colonel SUTTON. Good morning Mr. Chairman and distinguished Members of the Committee, thank you so much for inviting us today to offer insights on the Department's progress in establishing a Center of Excellence for Visual Impairment and Ocular Injuries.

I am accompanied today by Major General Gale Pollock who is the Deputy Surgeon General for Force Management and also the Chief of the Army Nurse Corps.

Most importantly for our purposes today General Pollock has been absolutely a pioneer in this effort, this campaign to improve care and research and treatment for our warriors who are suffering from visual impairment related to any cause including combat injury.

As the Director for the Center of Excellence (DCoE) for Psychological Health and Traumatic Brain Injury, I have a deep and abiding commitment to the development of this new center as vision impairment often results from traumatic brain injuries.

Visual experts in both the military and Veterans Health Affairs' Systems have recognized the importance of the continuum of ocular care and have initiated essential coordination and collaboration efforts. As you know, revolutionary lifesaving care results in sharply increased survival rates. That in turn means that profoundly injured patients reach facilities in the United States where they require extensive care and rehabilitation. We have amputee care centers and we continue the process of establishing the psychological health and traumatic brain injury centers to focus more specifically on the breadth of care required by our warriors suffering these injuries.

As we examine the many injuries suffered by our warriors, we find that a significant number have sustained visual impairments such as those suffered by Staff Sergeant Pearce and Petty Officer Minney today.

I would just like to take a moment to thank those two individuals as well as Ms. Angie Pearce for coming forward and exercising the courage to tell their stories that we together can learn from them and do better. We owe them our best.

In addition to visual deficits caused by direct injuries to the eye, visual problems also may present in individuals suffering traumatic brain injury. This may include injury due to repeated mild concussion as well as other more severe traumatic brain injuries. TBI can disrupt the visual process interfering with the flow and processing of information. Visual problems resulting from TBI can be overlooked during initial diagnosis and treatment of the injury. Frequently these visual problems are subtle and when neglected they can lengthen and even impair rehabilitation.

To meet the needs of wounded warriors who require definitive treatment and rehabilitation for visual impairment the Department is currently reviewing a comprehensive concept for the Congressionally directed Center of Excellence for Vision.

This proposal depicts the Center as a central hub for coordinating a program or network of excellence with multiple sites located throughout Departments of Defense and Veterans Affairs to ensure a holistic spectrum of rehabilitation, technology, education, research, and compassionate care. This new visual program will provide our visually impaired wounded warriors with individualized treatment and rehabilitation tailored to traumatic injury to the eye and visual nervous system.

Clinical activities of this center as in the other centers will be bolstered by an active research capability having strong ties to leading academic, private and international eye injury research centers.

This research capability will allow the latest advances in care, technology and rehabilitation to be rapidly integrated into the center's programs, best practices and guidelines. The Department proposes expansion of its current network of research partners with an increased investment in technologies focused on preventing, diagnosing and restoring visual function lost due to trauma.

The role of the center with its collaborative networks within the military and the veterans systems and the private sector, its research programs, its development of best practices, and clinical guidelines, its training for caregivers, its outreach to families for inclusion in patient rehabilitation plans and importantly its advancement for prevention, care, treatment and rehabilitation will underscore its value as a national asset.

In closing, Mr. Chairman, eye injuries resulting from combat do demand an integrated and holistic response for prevention, treatment, education, surveillance and research. The Department's concept for this state-of-the-art, full spectrum, world class program of care with programs and research aimed at both near and long term improvements will meet that demand. Success is generated by integration of research, treatment and rehabilitation capabilities pioneered through this concept. It can transition throughout the military in veterans health systems and to the private sector where these improvement will benefit our Nation as a whole.

Thank you, Mr. Chairman and distinguished Committee Members, for your strong interest and dedicated concern for the health and well-being of our warriors and for providing the resources needed to help us help them return to productive lives.

We are reminded that no condition or disease is rare for the individual who suffers from it. I think you will agree with me that it is time for a little less talk and a lot more action. Together we will keep after it, our warriors deserve our best. At this time, Mr. Chairman, I would be happy to answer your questions.

[The prepared statement of Colonel Sutton appears on p. 69.]

Mr. MITCHELL. Thank you very much. I would also like to ask General Pollock if she would like to make any statements.

STATEMENT OF MAJOR GENERAL GALE S. POLLOCK

General POLLACK. Thank you. I'd like to thank the Committee for being willing to look at what has traditionally been an area that has been left and pushed aside in healthcare because vision rehabilitation has been so difficult.

So I'm delighted that all of you are interested in that. And I'm also very pleased that our servicemembers and their families were willing to come here and share their stories and continue to support one another. The buddy care that they continue to do is truly amazing.

I have been delighted in the last couple of weeks—months to be officially, as of last week, designated as the Conceptual Director of the Center of Excellence for Vision. And I have some good news that I would like to report over that, because although there is no policy, although there has been no over guiding direction from either one of the departments, the people that do patient care everyday have been very engaged with one another.

Starting last summer, they began working together and in September there was a combined DoD/VA Visual Professional seminar out in Seattle. And then in December there was the VA/DoD Visual Consequences of Traumatic Brain Injury, that was attended by over 500 people from the militaries, from the VA, from other government agencies and there were international participants as well as we tried to draw together all of the people who had information that could help us move forward.

The Army has been engaged in some of this because of the blast injury research that has been ongoing and that work up at Medical Research and Materiel Command (MRMC) is going to be instrumental in our future because we have to look at the mitigation of these injuries whenever that is possible.

The other piece that I think is very good news is we have identified the different data sources that might have information about any of these servicemembers who are suffering from visual challenges. And we are now running them together to say, okay, have we missed anyone. Are there people that are falling through the gaps.

So the clinicians are very, very engaged. We have the IT people engaged and I think that you will be pleased with the progress that we will be able to make over the next few months.

Thank you.

Mr. MITCHELL. Thank you. I have a couple quick questions. First to those of you from the Palo Alto, do you recommend testing and follow-up for all patients that have had TBI, blast induced TBI?

Dr. COCKERHAM. I can only speak for the population, Mr. Chairman, that we are currently working with and it is our practice to do that at Palo Alto and it is certainly our practice as part of the study that we see everyone that is an inpatient. I am restricting myself to the inpatients and perhaps Dr. Goodrich can.

Mr. MITCHELL. Kind of a follow up to that. Do you know if there are any other polytrauma centers doing the same thing or is it just Palo Alto?

Dr. COCKERHAM. I am not—I cannot speak to that, I can only speak to Palo Alto. The other PRCs have ophthalmology and neuro-ophthalmology and optometry staff. But as to their current practice I cannot speak.

Mr. MITCHELL. So all the research that is being done is being done in Palo Alto?

Dr. COCKERHAM. That is the only one that I am aware of in this particular population, yes, sir.

Mr. MITCHELL. Thank you. Colonel Sutton or General Pollock, either one, in the 2008 National Defense Authorization Act, it directed the VA and the DoD to develop a cooperative program for servicemembers and veterans with TBI for “vision screening diagnostics, rehabilitating management and research.” Now the question is, why would you want to separate the vision center from the TBI Center for Excellence?

General POLLACK. Sir, I believe there were two different issues. There definitely needs to be attention directed at the visual consequences of traumatic brain injury and that must work in very, very close collaboration with the Center of Excellence for TBI but there are other injuries that are not the result of TBI that also require care. And collectively across the VA and DoD we felt that all of those patients who have visual injuries should be addressed in that Center of Excellence.

Mr. MITCHELL. You know earlier we heard two servicemen who fell through the cracks because they had nothing that physically looked like they had an eye injury. How are you going to address these kinds of issues if you separate and say well we assume that those people who do not have any physical impairment with their

eyes then they will go to traumatic brain injury, the center for excellence there. How would you ever check?

General POLLACK. Sir, I believe that the clinical guidelines and the evidence based practice parameters that we are looking at now will require that everyone be screened rather than waiting for people to make a complaint to say, gee, I think that something has changed. And that is where the research that is being done now is really going to help us because we will understand what changes we should expect; therefore, what are the most appropriate screening tests to be done. But I think that it is not going to be just those who are blast injured. We have a significant number of men and women in the services who are very actively engaged in sports. We have head injuries as a result of sports. Motor vehicle accidents. I think some of the second and third order effects of the work that these clinicians and researchers are doing, is going to demonstrate other gaps in our healthcare system that we need to address so that we can ensure after people are injured for any reason, we can return them to their maximum level of functioning.

Mr. MITCHELL. Will you be testing all blast induced TBIs for vision care?

General POLLACK. I pause simply because I want to really look at the research, because one of the pieces that we look at is how are you exposed to the blast. If you were in a vehicle in a convoy and one of the vehicles was affected by a blast, how do we define your exposure to blast. And we have not defined that well yet. You know, how close do you have to be? What kind of physical changes do you manifest as a result of the blast? It is not just the psychological exposure of, I was in a convoy that had IEDs go off. And I don't think that we have done a complete analysis yet of what that space needs to be. That is certainly why we are putting the little manometers on helmets now, to help determine, what is the intensity of a blast so we can then look to see, gee, what does the data show us. Unfortunately we do not have answers to a lot of these questions and that is why it is so important that we do the research and truly make it evidence based so that we are doing the best that we can for the men and women that are serving.

Mr. MITCHELL. One thing that I heard from the testimony earlier was that there was a 10-month gap from the time the person was injured until they finally recognized that he needed to go to have some screening. And this occurred outside, it was not inside a vehicle. From what I understood the blast occurred and he ran up against a rail. And we also heard that it was important that the quicker people get therapy, the quicker they can be healed. So if we are spending an awful lot of time trying to find out what kind of blast, how was the blast, where were they, we could be losing valuable time. And as I heard earlier, 70 percent of our senses are sight. This is pretty dramatic.

Colonel SUTTON. Mr. Chairman I would certainly share your concern as well as your urgency. The research is absolutely essential but we are not waiting to get the results back from the research. We have already launched the MACE Test, which is the Military Acute Concessive Evaluation Scale which is being implemented throughout theater. What that does then is when a unit comes back or a squad comes back from patrol, if they have been exposed

to a blast, their leader then will have them fill out that concessive evaluation. That is entered then to become part of their medical record. And then at any other point where they receive medical care or when they go through the variety of screening mechanisms that we have in place now which do include the pre-deployment health assessment, and post deployment health assessment. Also, we realized back in 2005 that a number of our soldiers coming back from deployment, waited between the assessments and seeing their families and going on block leave after a year in combat. They were not eager to spend a lot of time going through surveys and hearing briefings. So the post deployment health reassessment program has been another really important opportunity, between that 90- to 180-day window, to again, address issues related to the kinds of problems they are having, headaches, blurred vision, dizziness. It is a chance for every soldier to sit down with a healthcare professional and review their health status.

The yearly now periodic health evaluation is another time that we address the health status with our warriors and their unit leaders. So there are a variety of opportunities along the way as well as, of course, any warrior can go to sick call on a daily basis to access healthcare if they are having an acute problem.

So we are absolutely focusing our efforts at this point to educate our providers so that they know to be sensitized to the connection between traumatic brain injury and visual impairment and ocular injuries. We are also developing that system with the MACE that I described for you that will allow us to have documentation in the medical record at the time of the blast that this servicemember has been exposed.

Mr. MITCHELL. Two very quick ones. One, is DoD doing any research or is it just the VA doing research on this?

Colonel SUTTON. No, the DoD absolutely is doing research on this and in fact we had a number of studies that were funded in this last year's Broad Agency Announcement which was just completed. In fact I have the records here, sir, which I will be glad to submit for the record that shows all of the DoD funding.

Here is our challenge though. In the past, much of that funding has been for visual impairment due to illness as opposed to blasts. And so we are now looking, starting with this year's program, to expand that focus and then as we develop the Broad Agency Announcement for this coming year, we will likewise expand our focus to make sure that this essential area of knowledge becomes part of our research program to a greater extent than ever before.

Mr. MITCHELL. And one last comment. We heard this morning and we have heard at every one of these hearings the lack of continuity of records flowing from DoD to the VA and the corpsman carried his own. He knew better.

That is something that we have to continually improve on because no one can get the full medical care they need unless the physician has all of the records. And so that is something that has to be improved upon between the two departments.

Colonel SUTTON. Thank you.

Mr. MITCHELL. Mr. Wu.

Mr. WU. Thank you, Chairman Mitchell, for extending Ms. Brown-Waite's request and the courtesy of counsel being able to

ask questions. But with your permission I would defer my line of questioning until after Dr. Boozman since he has the degree and the specialty in the area.

Mr. BOOZMAN. Thank you very much. First of all I want to thank all of you. I know how hard you work to take care of our soldiers and really are doing a good job and it is a very challenging job especially as we start to see things that we have never seen before. And I know in visiting with our optometrists and ophthalmologists, you know, the way we got involved in this is that they were concerned that they were seeing a class of patients that outwardly everything seemed to be normal and yet they could not concentrate. They could not scan the way they were before. You can imagine if you are a National Guardsman and you were an accountant or a top English or really whatever your profession was and all of a sudden you came home and you could not concentrate or whatever and then that becomes very frustrating and it can cause all kinds of problems.

So I think that is why—you know, you alluded to a lot of different things. I think that is why the registry is so important. You know, that we can link certain entities. You know, certain symptoms with what is going on. And so I hope that we are proceeding on. You made the statement, you know, a lot less talk and a lot more action and I think that really is the key. What I want, as I alluded to earlier, is that if an individual—I was in Iraq last weekend, and what I want is if one of those guys goes through any sort of injury, eye injury or whatever, but we are talking about eye injuries today, that they will get treatment based on what we know now. Because we do know a lot more about this and hopefully we are disseminating that information so that when these guys come back with these injuries, we will be able to treat them better and then also be able to rehabilitate them better. And then the other part of that is to prevent them better. If we can figure out exactly how to link whatever. So I am really excited about this. And again the things I want to know I think the concept is great. The question is, though that we have to get it done. Not getting it done in a fairly short timeframe really is inexcusable.

How are we with funding and stuff? Do we have the money? Are you going to come to us next year and say well we wanted to do this but we could not because we did not have any money?

Colonel SUTTON. Sir, I will need to take that one for the record. As you know we support the President's Budget, but we would certainly be glad as we develop this concept and get it approved in the very near future which is certainly the plan. In fact I would say, and I'll let General Pollock comment on that, but within just the very near future this concept will be presented to the Assistant Secretary of Defense for Health Affairs, Dr. Cassells. And upon approval of the final plan then certainly we will figure out the kinds of funding and support that will be required to execute it.

I can assure you sir that it is not our intent to come back next year without any action this year.

[The following information from DoD was subsequently received:]

Preliminary estimates for the Department of Defense Ocular Center of Excellence initiative are \$3 million for Fiscal Year 2009 and funds are available within the Defense Health Program.

Mr. BOOZMAN. I guess my answer to that is that you do send these guys in harm's way, and this is something that—I mean, we pass supplementals, we do this and that. We provide body armor, we do the whole bit as we're asked to do. But there is no excuse for not taking care of them once we know that this problem is there. I mean that makes no sense to me at all and it is indefensible. I cannot defend that. So like I say, I know that you are working hard but again if we do not do this knowing that it is out there. If we are not able—knowing the testimony that we had earlier and then again—and those were pretty blatant cases. The ones that are really hard the questionable symptoms, you know, where this and that, that are much—that are a little bit harder sometimes to figure out although that can be equally as troublesome in the performing of their job and whatever. But like I say, we need to get this done and I know I am committed. The Committee is committed. This is a VA Committee and I know that you are DoD, but again it is just something that we have to get done. So have you got a time line for us?

General POLLACK. The expectation is that I will be presenting the next steps in how we would move forward on the 17th of April to combine DoD and VA panel. The same group that met together about, just about a month ago, asking me to put that together. And then they will be identifying the lead for that to be able to take that forward.

Mr. BOOZMAN. So, will you be in charge of that, General Pollock, or is that your deal?

General POLLACK. I will be coordinating it for the next few weeks. I go to a retirement position effective the third of July.

Mr. BOOZMAN. So who is taking your place?

Colonel SUTTON. No one can take Major General Pollock's place, sir.

General POLLACK. There has not been anyone identified at this time, sir. We will be talking about that on the 17th when we get together.

Mr. BOOZMAN. So Dr. Sutton and you will be—

General POLLACK. She will be at that meeting as well.

Colonel SUTTON. There is no question the interaction, the collaboration, the support, not only within DoD, surrounding these issues, but of course as you have heard today with our partners in the VA system and within the civilian sector at large, it is absolutely essential whether the concern is traumatic brain injury in general, visual disturbances as a result of TBI, psychological health, whatever is ailing our wounded veterans and of course their families, we are there sir.

Mr. MITCHELL. Okay, so I guess the other questions then is, very quickly, you are happy with the structure of the law, the structure of the concept, as far as the Eye Center of Excellence. I mean we are all in agreement with the things that need to get done. Is that right? And we are in agreement with the collaboration between VA and DoD helping out?

Dr. ORCUTT. I can comment on that too, I am very happy with it. In fact, I was the VA representative to the February 28th meeting. Met with the DoD several times and they strongly encourage that ongoing collaboration. It was not something I had to force on

them to be in there. It is an open and free meeting. We started on this project between my compatriot in the Army last summer because we recognized we needed this registry. We needed to move forward. So we started with all the meetings that we have already mentioned. We are having ongoing conference calls twice a week with DoD people. We are moving very rapidly in order to work toward the registry and also in great cooperation with the DoD. And I could not, frankly, be happier than what I have seen in terms of the willingness and ability to work hand-in-hand with the DoD folks that are in charge of this. So, I am very pleased.

Mr. BOOZMAN. Good. Thank you very much. The only other thing is hopefully in the not too distant future, you can have us out, Dr. Sutton, and kind of show us what is going on. And we will go from there.

Colonel SUTTON. Sir, thank you so much. I would be delighted to have you folks out. And as you mentioned and just been affirmed by the VA, we are all in this together. There is no daylight between DoD and VA on this issue. We are absolutely committed to providing the very best for our warriors and their families.

And of course, sir, as you well know, today's best is just that. It is not good enough. We have to keep making it better and better. Thank you so much.

Mr. BOOZMAN. Thank you very much. Thank you, Mr. Chairman.

Mr. MITCHELL. Thank you and thank you very much. I appreciate that. One thing that I was struck with that I think is important, was when I was in Iraq in January, we were told by a commander that in this day of voluntary military service, they do not just recruit a soldier anymore, they recruit a family. And that is so important because the family is an important part of the whole healing process. And to hear what went on this morning, the couple that have a 10- and 9-year-old. And they are up in Alaska. We really need to treat the family just as we do the individual soldier. They are an important part—they are in this together. And I appreciate that. And I appreciate all of you and the research you are doing and the work you are doing and I thank you and that concludes the hearing.

Mr. BOOZMAN. Can I just—

Mr. MITCHELL. Sure.

Mr. BOOZMAN. Dr. Sutton and General Pollock alluded to a meeting that you are going to have. Could you follow-up with us in writing about how that went—

General POLLACK. Certainly.

[The information from DoD follows:]

The purpose of the meeting referenced by Mr. Boozman was to determine who would replace Major General Pollock as the lead for the Vision Center of Excellence. The scheduled meeting between Major General Pollock and Brigadier General Sutton did not occur. The Assistant Secretary of Defense for Health Affairs initiated a nomination process to select a leader for the Center who would report directly to the Director, TRICARE Management Activity. Colonel (Dr.) Donald Gagliano was selected as the Director, Vision Center of Excellence and Dr. Claude L. Cowan was selected as Deputy Director.

Mr. BOOZMAN. Okay. Thank you very much. Thank you, Mr. Chairman.

Mr. MITCHELL. I am sorry.

Mr. WU. Thank you, Chairman Mitchell.

A couple of things in conjunction. You got your question, Dr. Boozman?

Mr. BOOZMAN. Yes.

Mr. WU. Dr. Cockerham, Dr. Goodrich, good to see you again from Palo Alto.

I see in the testimony you had here, specifically in the work done by Dr. Cockerham, looking specifically at a small sample population, the PRC with TBI. TBI caused combat blast, that there were significant abnormalities and visual function were found despite normal or near normal visual acuity by conventional testing.

I think that when the staff, Geoff Bestor and I were there, the question came up, if that is documented in your population and is replicated in a larger sample, the question came up should there be redeployment of those soldiers, the servicemembers that are going to be redeployed after being subjected to IED and perhaps MTBI and whether they should be redeployed or not.

Would you like to comment on that?

Dr. COCKERHAM. I think it is a little outside of my sphere. I can speak specifically about the problems we are finding in the small sample we have looked at so far if that would be helpful. But the ramifications of that to the larger system, I do not know that I can shed much light on that.

Mr. WU. Colonel Sutton.

Colonel SUTTON. Sir, I would definitely agree that we need to expand the research that has been started at Palo Alto. I think we need to expand it to both populations that are in the other poly-trauma centers as well as at places, oh, say, Fort Lewis or Fort Hood, places where you have a large power projection platform and where you can see in a more general population of warriors who are coming back who have not been as severely wounded, but we need to better understand the entire spectrum of and continuum of care as well as depth—

Mr. WU. Right. I understand that.

Colonel SUTTON [continuing]. Of the injury.

Mr. WU. The question I have is, if, in fact, you have documented TBI—

Colonel SUTTON. Yes.

Mr. WU [continuing]. On a servicemember that has been in theater and there might be documentation or it looks like the possibility that there is some abnormality that has manifested, should they be redeployed without some more intensive and conclusive testing, whether it be optometric or ophthalmological, before they are redeployed?

I think on Chairman Mitchell's CODEL in January, we came across servicemembers that had been exposed to multiple IEDs and were on their second and third deployment.

Colonel SUTTON. Yes, sir. I would absolutely agree for those soldiers for whom we know that they have been exposed to repetitive blasts or even a single blast with a sufficient magnitude to cause serious injury, there is no question but what further evaluation would be in order. And that is why we have the pre-deployment checks that are in place as well as the post-deployment. And we

will continue to learn as we go from the research, but we are not waiting for the research results. We are moving forward in that effort.

Mr. WU. Can we ask then when a servicemember comes back from theater or in theater that is subject to an IED or EFP, are they then seen by an ophthalmologist or an optometrist or are they just going through the assessment form, self-assessment form?

Colonel SUTTON. When they come back and go through the post-deployment health assessment, if they are having any health problems, they are evaluated. They are actually evaluated by a primary care provider. They are going through the screening process. And any difficulties that they identify, if they require specialty referral, then they certainly get that specialty referral.

Now, the case that you mentioned, sir, which certainly concerns all of us, might be that warrior who is coming back and perhaps does not at that point realize that they have some sort of visual impairment or processing impairment perhaps related to a traumatic brain injury, and that is where we are really focusing our efforts right now to increase our knowledge so that we can determine best how to identify and meet the needs of those individuals.

But certainly for anyone who is experiencing symptoms, whether that be headache, blurred vision, dizziness, et cetera, they are absolutely evaluated at that time and referred as needed.

Mr. WU. All right. I failed to mention we had earlier brought to the attention of Ms. Brown-Waite that you are promotable. When do you pin your star on?

Colonel SUTTON. Sir, I feel way humbled and way blessed to become a Brigadier General on Friday, the 9th of May.

Mr. WU. That is great. Congratulations.

Colonel SUTTON. Thank you so much, sir.

Mr. WU. Dr. Orcutt, you know, I heard you say that there is a lot of collaboration and Kumbaya between you and DoD. I have been here for 14 years. I am looking at DoD/VA collaboration. That is the most positive thing I have heard in 14 years.

I mean, besides—

Dr. ORCUTT. Okay.

Mr. WU. Besides collaborating on the registry, what goes beyond that in this collaboration? I think you need to do more than a registry. I mean, that is my personal and professional opinion.

Dr. ORCUTT. Well, absolutely. I think that the cooperation we have had with the DoD and working with the VA input into what should be components of the Eye Center of Excellence within the DoD, there are all the types of things that General Pollock has already talked about, the increased research, the increased education, dissemination of information, best practices, dissemination.

But I think that is what I feel is going to be so positive about this center is that with both sides being involved, we are going to have this information and research developed on both sides distributed on both sides.

The other great thing is on the eye care registry side is the notion of this being a bidirectional information flow. It does not start in the DoD and end in the VA. It starts wherever a patient is first identified and flows both ways.

And so the DoD can do a lot more of their preventative research based upon some of the longitudinal long-term outcomes of their veterans that they cannot do now because of shorter-term follow-up.

There are so many advantages to the registry that it is just almost impossible to list them all, not the least of which is professional——

Mr. WU. The other question I have is, Colonel Sutton mentioned there was some research being done on the DoD side. You said that there is research being done on the VA side with Dr. Cockerham and his fellow practitioners.

Can you identify any of this research that is collaborative?

Dr. SIGFORD. I think we should take that for the record. We have specific research departments in the VA and in DoD. And I would like to request that we search those databases to look for this and take that question for the record.

[The following was subsequently received from VA:]

Question: Are VA and DoD cooperating on any research projects on TBI-related vision issues?

Answer: While the Department of Veterans Affairs (VA) and the Department of Defense are independently funding a number of research projects, VA is unaware of any jointly funded efforts concerning TBI-related vision issues. Joint work could be ongoing at a local level or through independent support.

Mr. WU. That is fine, Dr. Sigford, but there is nothing that comes to your mind immediately?

Dr. SIGFORD. Not directly, no.

Mr. WU. Dr. Cockerham.

Dr. COCKERHAM. No, sir, not at this time.

Mr. WU. Would it be safe to say that there is probably no collaborative research at this time to the best of your memory and experience? Anyone on the panel?

Colonel SUTTON. Sir, I think we can improve our efforts in this area. Certainly with the supplemental funding that came out last year for the broad agency announcement encompassing both traumatic brain injury as well as psychological health issues, I can assure you that we will ensure that there are collaborative efforts this next year involving both VA and DoD.

As Dr. Sigford said, there may well be some already. I am a psychiatrist, not an ophthalmologist, but I will certainly look into this to figure out what we can do.

General POLLACK. I do know that there is work going on with the VA center that is in Seattle and Madigan Army Medical Center. Their optometrists, their ophthalmologists are working at both facilities dealing with patients and following them across. I would expect that there are initiatives up there at least.

One of our challenges, I think, is that we are not always collocated with one of the VA polytrauma centers, so it makes it more difficult to do some of the immediate research. But since so often our staff are also doing training at the VA facilities, I would expect that there are levels of research that are being done now that are simply not visible at our levels. But we can get back to you.

Mr. WU. That is great. I just would hate to see you all plowing the same north 40.

Dr. SIGFORD. Right. And I would like to also make one comment in that in the VA, we have what is called the Polytrauma and Blast-Related Injury Query which is a quality enhancement research initiative.

We have on our executive panel members of the DoD. And this is really one of our programs which allows us to develop this cross-collaborative research and discuss the needs for this. So that is another piece that I know we have in place currently.

Mr. MITCHELL. Thank you. And thank you all for being here. And we are all working for the same end. Thank you.

[Whereupon, at 12:22 p.m., the Subcommittee was adjourned.]

A P P E N D I X

Prepared Statement of Hon. Harry E. Mitchell, Chairman, Subcommittee on Oversight and Investigations

We are here today to hear from veterans and the Department of Veterans Affairs about a very serious problem for the care of wounded servicemembers that has been overlooked for too long. Traumatic brain injury (TBI) is one of the signature injuries of the wars in Iraq and Afghanistan. I am afraid that vision problems are becoming the unrecognized result of that injury.

Research being conducted by physicians, psychologists, and blind rehabilitation specialists at the VA Palo Alto Polytrauma Rehabilitation Center and the VA Western Blind Rehabilitation Center shows that TBI causes serious vision disturbances in a large number of cases even when the veteran retains 20/20 vision and without any obvious injury to the eye. We will be hearing today from Staff Sergeant Brian Pearce and Petty Officer Glenn Minney, Iraq veterans who are legally blind as a result of TBI.

Staff Sergeant Pearce and Petty Officer Minney do not have happy stories to tell us about their experience after they were injured. We owe these two a great debt for their service. Both of their TBI-related vision issues went unrecognized and untreated for a long time.

The wars in Iraq and Afghanistan have forced us to deal with unexpected and often unpleasant realities. But we now know that military and VA healthcare providers must be especially alert to vision deficits resulting from TBI—even when there is no obvious physical injury to the eye.

This is not only critical so that these vision deficits can be addressed, but also because undiagnosed vision problems can seriously interfere with TBI rehabilitation and also rehabilitation for other injuries that often occur along with TBI.

Following our first panel, we will be hearing from several companies that are working with the VA to provide innovative treatment for TBI-related vision deficits. Our third panel consists of witnesses from both DoD and VA.

Two of the researchers from the Palo Alto VA are leading efforts to better identify and diagnose vision deficits in TBI patients. They are to be commended for their cutting edge work. In the 2008 National Defense Authorization Act, Congress directed DoD and VA to create a cooperative program specifically to address TBI-related vision issues. We are looking forward to hear exactly what it is that the Departments are doing, how they are directing funds for their efforts, and when they expect to have a fully functioning program.

I am also very interested to see whether DoD and VA are currently doing all they can to identify and track these patients, not just at Palo Alto but everywhere. Because the seriousness and extent of vision problems resulting from TBI are just now becoming better known, we would like to hear from the Departments what they are doing to identify and contact TBI patients whose vision issues may have been overlooked.

Our veterans served honorably to protect our Nation. We have a responsibility to take care of them when they come back home.

Prepared Statement of Hon. Ginny Brown-Waite, Ranking Republican Member, Subcommittee on Oversight and Investigations

Thank you for yielding, Mr. Chairman.

Mr. Chairman, I appreciate you calling this hearing to allow us to review how the Department of Veterans Affairs and the Department of Defense are evaluating and treating vision problems encountered by OEF/OIF soldiers and veterans returning home with traumatic brain injury.

As we know, this war is different in many ways from those of the past. Soldiers who sustain injuries that would have resulted in death in previous conflicts now have a much greater survival rate. However, survival does not necessarily mean returning home to a normal way of life.

Improvised Explosive Devices (IEDs) and now Explosive Formed Projectiles (EFPs), cause some of the most serious injuries among OEF/OIF soldiers. Because of these types of attacks, many of our most severely injured veterans experience traumatic brain injury, and require treatment at one of the four Polytrauma Rehabilitation Centers (PRC) across the country.

The Polytrauma Rehabilitation Center nearest my district is at the James A. Haley VA Medical Center in Tampa, where I am a frequent visitor, and see first hand the tremendous strides wounded soldiers make. I am also pleased that the VA has made a commitment to expand the PRC network to include a facility in the San Antonio, Texas area.

Treating these severely wounded servicemembers has been a learning process. As our physicians treat the various and previously unseen injuries from IED/EFP blasts, we learn more about resulting co-morbid conditions, such as visual impairments suffered by our servicemembers.

From information that I have obtained, over 44,000 veterans have utilized the services of VHA's Blind Rehabilitation Program. We here on the Committee need to be assured that these veterans are receiving the care and services they deserve.

I look forward to hearing the opinions of our first panel as to the evaluation, treatment, and care they received while moving from the battlefield through to the VA. I have read your testimony, and again, the transitions you made going from the Department of Defense to the Department of Veterans Affairs have not been an easy road to follow.

I would like to ask the Administration officials sitting behind you to listen closely to your testimony. The situations you have encountered along your path to recovery need to be resolved by both departments so that others do not face similar problems in the future.

I also look forward to hearing from officials from the Palo Alto VAMC on the research they are doing with respect to vision issues related to traumatic brain injury. I would hope they are sharing their experiences, methodologies and treatment plans with the other PRCs.

As I have said in the past, all medical centers need to be sharing their best practices with one another, so that our veterans and servicemembers receive the best care possible. This is particularly critical in the area of traumatic brain injuries, where treatments are often on the cutting edge.

I would like to commend the work of the Blinded Veterans Association (BVA) for their efforts. I look forward to hearing what they have encountered when helping veterans navigate the system.

Again, thank you Mr. Chairman for calling this hearing, and I yield back the balance of my time.

**Prepared Statement of Hon. Corrine Brown,
a Representative in Congress From the State of Florida**

Mr. Chairman and Members of the Subcommittee, I am pleased to introduce NovaVision today for their testimony regarding TBI and vision.

NovaVision, Inc., headquartered in Boca Raton, Fla., develops and provides scientifically based, innovative medical devices and comprehensive solutions to restore the vision of patients with neurological visual impairments. NovaVision's FDA-cleared NovaVision Vision Restoration Therapy™; (VRT) is based on neuroplasticity—the brain's ability to adapt and form new connections to compensate for injury. NovaVision diagnostic testing maps areas where vision may be improved, and therapy targets and stimulates regions within the brain's vision-processing areas.

VRT is based on more than 10 years of research with clinical studies published in leading journals including *Nature Medicine*, *Neurology*, and *The Journal of Cognitive Neuroscience*. Data from a recent retrospective study identified that more than 70 percent of U.S. patients who underwent VRT for an initial 6-month treatment period showed significant improvements in their vision.

More than 1,000 patients have been treated with VRT and clinical results are positive. VRT is currently offered at leading neurological, eye and rehabilitation centers nationwide.

Dr. Marshall will elaborate further on this therapy.

Dr. Randolph S. Marshall is Professor of Clinical Neurology at Columbia University and Director of the Stroke Division in the Department of Neurology. Dr. Marshall obtained his undergraduate degree from Harvard College in 1982 and his medical degree from the University of California in 1988, including an MD degree from UC San Francisco and a Master's degree from UC Berkeley. He completed his neurology residency in 1992 at Columbia and subsequently trained as a clinical and research fellow in cerebrovascular diseases at Columbia-Presbyterian Medical Center.

His clinical work focuses on the treatment and prevention of stroke and related cerebrovascular disorders. He has a research program that investigates the hemodynamic and physiological mechanisms of stroke recovery, with emphasis on the functional neuroimaging correlates of brain plasticity and recovery after injury.

Current NIH grants include an fMRI project in acute stroke patients to identify patterns of brain activity that predict subsequent recovery of function, and a multi-center clinical trial to assess the effects of extracranial-intracranial bypass surgery on cognition in patients with hemispherical hemodynamic impairment from symptomatic carotid artery occlusion. He has also been involved in restorative treatment modalities after brain injury.

He is accompanied by Navroze S. Mehta, President and Chief Executive Officer, NovaVision.

Mr. Navroze Mehta brings 15 years of experience managing technology companies to his post at NovaVision. Mehta co-founded NovaVision in 2002 guiding the company through the FDA clearance of its Vision Restoration Therapy (VRT), the accumulation of 50 Partner Centers and three rounds of financing.

Mr. Mehta received an MBA from Syracuse University and a Bachelor of Commerce degree from Sydenham College at the University of Bombay, India. He is a Certified Public Accountant (CPA) in the State of New York, a member of the Young Presidents Organization (YPO) and past chairman of America's Gateway Chapter in Miami.

Thank you Mr. Chairman.

**Prepared Statement of Staff Sergeant Brian K. Pearce, USA (Ret.),
(U.S. Army Combat Veteran), and Angela M. Pearce, Mechanicsville, VA**

Chairman Mitchell, Members of the Subcommittee, thank you for the opportunity to speak to you today regarding our experiences following my injuries in Iraq and during my medical care to date.

I joined the U.S. Army in June 1992 and served until March of 2000, joining the WVARNG. After a 3-year service break I returned to Active Duty in January of 2004. My new duty stationed was the 172nd Stryker Brigade Combat Team out of Ft. Wainwright, Alaska. There I was assigned to 4-11th FA as the Brigade's Survey/Targeting Acquisition Chief. After an intense training period, we deployed in July of 2005. My SBCT spent August 2005 through August 2006 the first year of our deployment operating in the Mosul area. As the Brigade prepared to re-deploy home to Ft. Wainwright in July we were extended for 120 days. I had already returned to Alaska in June to prepare for our Brigade's homecoming. Then I was called back in August 2006 to our new area of responsibility in the Sunni Triangle.

On October 20, 2006, I was severely injured by an IED blast that caused shrapnel to penetrate the right occipital lobe of the skull. Once the blast zone had been secured I was air evacuated to the field hospital in Ballad, Iraq. There I underwent an emergency craniotomy of the right occipital and posterior fossa with duraplasty retaining foreign body, and a ventriculostomy. This blast in turn caused me to suffer from a severe TBI and cortical blindness. Later we learned it was the cause for more complex visual impairments, PTSD, hearing loss, pulmonary embolism, seizure and REM sleep disorders.

During this time, my wife was contacted in Alaska and was told that I had been involved in IED blast and was in stable condition complaining only of neck injury. Roughly 3 hours later she was contacted by my commander who was with me in Iraq. He then told her that I had come through the brain surgery fine and was listed as very critical and once they could get me stable enough I would be air lifted to Landstuhl, Germany. She was not told of any problem with my sight at that time. Then that evening, my PA's wife came over to check on her and bring dinner. The PA's wife then asks how my sight was. Of course my wife had no idea what she was talking about. Once she was able to talk to my doctor at Ballad, this was the first question she asked him about. My wife was told at that time my diagnosis was cordial blindness and a severe TBI.

Sometime on 21 October, I was air evacuated to Landstuhl, Germany. There I underwent a re-exploration surgery before being transported onto the U.S. mainland. Upon my arrival in the States on 24 October, I was admitted to Bethesda Naval Hospital first to have a cerebral angiogram done. Late on the evening of 25 October I was transferred to WRAMC's ICU. There I remained in a coma-like state for 47 days. During this time my wife kept asking for someone to tell her something about my visual problems but was told that the TBI needed more attention than the vision. During the entire time I was a patient at WRAMC there was not much done for my visual problems. The only thing that my wife was told is that an ophthalmol-

ogist came to look at my eyes and dilate them. However, before they could complete an exam they received an emergency in the OR.

Once I had somewhat regained my consciousness my wife was forced with the decision of what VA treatment facility I was going to be transferred to. Walter Reed had determined there was nothing more they could do for me. She chose Richmond and their PRC, knowing they did not have a low vision center there. The main reason for this decision was due to the fact that my wife had to leave our 7- and 8-year-olds in Alaska with a friend. Then they would be coming to stay with family in Ohio and this would be the closest PRC for us to see the kids. However, she was assured by officials at WRAMC that the vision problems again needed to take a back seat to the TBI and its severity. They did tell her however to discuss further treatment options with the staff at Richmond. If need be I could be transferred from there to another facility to deal with my vision impairments. The day that I was transferred to Richmond there BROS was awaiting my arrival to begin making an assessment on my vision. In the VA hospital there was little additional information as far as the vision was concerned. This left us to wonder how this type of injury could be taken so lightly. Especially, with your sight being a vital part of your day-to-day activities. How we stacked up against others that had been treated either by the VA or the DoD. It was at Richmond where I was diagnosed with a left sided homonymous hemianopsia on December 11, 2006.

In January of 2007, I was discharged from inpatient care at Richmond where I had spent approximately 1 month. My inpatient care consisted of KT, PT, RT, OT, mental health, speech, and vision sessions. After my discharge I began outpatient therapies in February consisting of KT, PT, RT, OT, speech, vision and mental health. I should have returned to WRMAC to await my medical board. However, my wife had been told from several people to include my case manager at WRMAC that they could not offer the service I needed for my vision impairments. So we decided to get authorization to stay at Richmond to continue my care while waiting for my medical board.

My medical board was started in March 2007. Everything went pretty smooth with this except for portion of the exam on my eyes. After getting a hasty eye exam from the optometrist she told me "I know what's wrong but it would require me getting out my text books and I don't have time, go to the VA." They should be able to assist you with this since you are getting most of your care there. We turned in all the paper work to the PEBLO around the 9th of March 2007. He told us that it would take a couple of weeks to get all of the narratives from the doctors to send to the MEB. However, by the end of April 2007 we had not heard anything regarding the MEB. My wife contacted my PEBLO to find out what the status was on my MEB. He started researching the matter to find out they couldn't find my physical exam information. Finally he was able to track it down and sent it on to the MEB the first part of June 2007. The middle of June we received a call from the PEBLO that the MEB needed more documentation on my vision impairments. My wife gathered all the medical records she had from the Richmond VA and priority mailed them to the PEBLO on June 19, 2007. A few weeks went by and when we hadn't heard from him on the status of the information that we mailed to him.

My wife contacts him around the end of June leaving a message for him to contact us regarding this matter. Finally, he returned her call right after the 1st of July 2007 to tell us he had not received these documents that she sent him in June. My wife checked with the postal service to track the documents sent. She was able to track that the documents has been delivered to the address at WRAMC on June 22nd and signed for on the 23rd. The PEBLO went to the postal service on WRAMC to check if it was there to be told no. Finally on July 9th 2007 he signed for and picked up the documents needed to complete the MEB stage. The PEBLO found out that the documentation had been locked up in WRAMC post office safe since June 23, 2007. Keeping in mind this should have already been done during my eye exam for the MEB physical. I think around July 19, 2007 my PEBLO calls to let us know that the MEB needs a current Goldman Visual Field screening in order to finish their finds on my vision. So we had to try and jump through hoops to make this happen with being on a tight timeframe for the MEB. My MEB six month window was due to expire on September 7, 2007. If not sent on to the PEB by this date I would be required to start the process all over again. We were lucky enough to have a good Vist Coordinator who was able to make this happen. After having Goldman visual field test July 23, 2007 I was diagnosed for the first time as being legally blind.

In June of 2007, my BROS therapist who had been growing increasingly frustrated at the lack of cooperation between the polytrauma network and the increasing difficulties in navigating the bureaucracy of the VA. He decided to leave this position. This left me without a blind therapist and no low vision doctor either.

However, there had not been a low vision doctor but he did have a doctor in the eye clinic he could work with. So I went from June until October 2007 with no care for my vision. My wife and I made the decision to send me to the Eastern Blind Rehab Center in West Haven, Connecticut after coming back from the BVA's 62nd National Convention.

Once I arrived at the Eastern Blind Rehab Center I was put through extensive and thorough eye exams. I spent approximately 6 weeks going through extensive care and therapy to help me cope with everyday living with visual impairments. I also found out how complex my visual impairments are. What most people to include my doctors and therapies don't understand is the fact that my vision actually has nothing to do with my eyes themselves. My visual impairments stems from my TBI. My eyes are actually very health and I have 20/20 vision. It is my brain that will not allow my eyes to function appropriately. I have been left with no peripheral vision and about 8 degrees centrally. My wife and I often wonder if we would have had more information early in my care if this would have changed the outcome of my vision or my abilities to function better with my vision impairments. However, we have talked to several specialists since going to Connecticut and have been told that this would have made no difference. One of my wife's biggest concern is could I have gained more out of my therapies if we had the appropriate diagnose from the get go? Since returning from Connecticut the Richmond VA has hired a part-time low vision doctor and full time BROS. They have a plan from the ophthalmologist from West Haven that they are following and continuing my visual therapy. One to two days a week I either see my BROS or the low vision doctor. They have given me a plan for eye exercises to do at home as well.

Some recommendations that my wife and I would like to suggest for a better seamless transition are:

1. More education for doctors, therapist, case managers, and nurses about visional impairments relating to TBIs both on DoD and VA side of the house.
2. Teams set up at the PRCs and MTFs to deal specifically with TBI patients with visual impairments.
3. It is imperative that there is a database both from DoD and VA to keep track of statistics on vision impairment associated with TBI.
4. More awareness of these types of injuries coming out of Iraq and Afghanistan.
5. There needs to be better communication between the DoD and VA to better plan for transfer to the appropriate facility for treatment regarding TBI patients with vision impairments.
6. There needs to be easier way for the DoD and VA to share medical information pertaining to the injury and there also needs to be better communication between different VA centers to access medical information.

In closing my wife and I would again like to thank you for taking the time to listen to our testimony. We hope that you gain some insight from this hearing and make great strides to resolve these issues. I know that we are not the only ones to come up against these issues. I hope no other veteran has to feel there is no one who cares about the sacrifices they have made for their country. I proudly served my country and would do it again if I could. However, with the injuries I sustained I can no longer do the jobs I love. In November 2007 I was found unfit for duty. I was then retired with almost 16 years on December 27, 2007. Please understand that we have no complaints about the care that I received from the Richmond VA. I received excellent medical care here far better than the WRAMC gave me. The common thing we heard then and still hear now is we are understaffed. Well I and countless other leaders on the ground in Iraq were understaffed but we made due and completed our missions. Now it's time to do the job and account for our care. I will leave you with this question. Does the VA, DoD or anyone on this panel have any idea how many TBIs with visual impairments that have come out of this war? If you answer no I challenged you to find out and start tracking this information so that veterans get the utmost of care they so deserve.

Veterans such as me have sustained what has been identified as the signature injury for this war. We do not discount the importance of keeping track of those who have made the ultimate sacrifice, but there are solid numbers for them. We continue on a daily basis to increase our numbers and fall through the cracks. Where are the statistics for how many of us there has been? This is basic job performance that as a leader in the Army I was expected to do, what I expected my soldiers to do and yet the entire DoD and VA healthcare systems cannot perform what one single Private in the Army could do?

**Prepared Statement of Petty Officer Glenn Minney, USN (Ret.),
Frankfort, OH (U.S. Navy Combat Veteran)**

The testimony provided before this Committee today as a combat Veteran from the war in Iraq, and **not** as a VA employee, and I do not represent the views of the Department of Veterans Affairs on these issues today in my testimony.

I first joined the United States Navy on September 4, 1985, where I attended Basic Training as well as Naval Hospital Corps School all at Great Lakes, Illinois. After serving on Active Duty tour in the late '80s, I rejoined the Navy reserves in Columbus, Ohio. As a reservist, I was assigned to Lima Company, 3rd Bat, 25th MAR. As a civilian I was employed by the Department of Veterans Affairs as a Pharmacy Technician, and then as a police officer, and then finally as a firefighter.

On January 3, 2005, I was called to Active Duty to serve in Iraq. After spending 2 months at Twentynine Palms Marine Corps Base, California, the Battalion was on its way to Iraq.

The 3/25 was assigned to Haditha, Iraq, and also to Hit, Iraq. The majority of the Battalion was assigned to Haditha Dam, Iraq, a 10-story hydro-electric dam we used as a firm base. We had a makeshift chow hall, sleeping quarters inside engine rooms, and a Battalion Aid Station in a elevator control room.

On April 18 at approximately 1630 I was on the 10th story of the dam outside retrieving medical supplies from a con-ex container. Without warning I was lifted from the ground and a bright flash of light flashed before my eyes. The next few seconds were a blur. The next thing I remember was that I was up against the rail of the dam. I then began running toward the Battalion Aid Station. Once I arrived at the BAS, I checked myself for any injuries and then began getting ready to start taking in casualties. Luckily, there were no other casualties but I was informed there had been four other mortar rounds that hit the water around the dam. Those rounds I don't remember.

The next day I noticed my eyes were a little scratchy and I had a headache. The headache I figured was from the blast, and the eyes I thought might have been sand from the blast. Later I went to a fellow corpsman and had him look into my eyes and look for debris or scratches. Nothing was found that time. A few days later I logged in to be seen in sick-call. I was examined using an ophthalmoscope and nothing was seen so I was treated for pinkeye, and as far as the headaches went, Motrin. A month or two went by and the redness in my eyes was not getting better, nor were the headaches. I covered much of the problem up because I wanted to stay with my unit. Then one day I had awoke and noticed a slight veil covering the corner of my eye. I ignored it and went on with the mission. Days later the veil was almost covering my entire eye. I knew then I had to go back to the BAS. Once there, I described my symptoms to the Battalion Surgeon, who again looked into my eyes. Once again, they gave me the same pinkeye medication. The next day I was blind in my right eye, so I went back to the BAS. The Battalion Surgeon made a few calls and sent a few emails, and the next day I was flown to Al Asad Air Base. From there I was flown to Balad, Iraq. This was a Friday and once I arrived at the Medical Cache I was informed the eye surgeon was off duty for the weekend. I was placed in a transit tent until Monday when the eye surgeon was back on duty. That Monday I was seen and told I would be flown to Germany immediately on the next flight out.

Once I arrived in Germany, I was taken to Landstuhl Medical Center and placed in a room. I was advised I would be having my surgery in the German Eye University located in Hamburg, Germany. Within an hour on August 16 was in surgery and the next day I was back in surgery having my left eye operated on. I spent 10 days in the German hospital with both eyes bandaged. And I didn't speak German. After having the bandages removed, I was then taken back to Landstuhl Medical Center. There I was evaluated and told I would be on my way back to the States in three days. After the three days, I arrived in Washington, DC, and was taken to Bethesda Naval Medical Center. Once there, I was seen by an eye surgeon and was told I was in the healing process and that there was nothing he could do. I was told I was to go home on 30 days con-leave.

I arrived home on September 1 and on September 3 I awoke to being blind again. After controlling the panic, I called my medical liaison at my reserve unit and was advised to call the closest eye surgeon who took TRICARE and get seen now. With the assistance of my fiancée, we discovered a local surgeon and he was willing to see me after hours. Once I was seen, we were told I would need surgery ASAP. Within hours, I was back in surgery having my right eye operated on. After the surgery I was informed that I would have to lay flat for one to three months face down. After that first month, I was called by Bethesda Naval Medical Center and was told I was to report at once. I didn't know what to do. I called my reserve center and advised them what was going on. I was told the Commanding Officer would take

care of it. Within days, I was advised that I was now assigned to my parent command in Columbus and that I could call daily to check in.

During recovery time, I continued to have some headaches and vision problems so I went to my local Veterans Affairs Medical Center where I worked as a civilian. After I arrived, I was told I could not be seen there because I was on Active Duty and that I had TRICARE. Also, because I didn't have a DD-214, I wasn't a veteran. After speaking with the Associate Director, I was seen without any problems. I was scheduled for an MRI of my head because the doctor I saw asked if I'd had any sort of imagining after the explosions or after the surgeries and I said no. In December 2005, I was called by BUMED and advised that I either had to report to Great Lakes and process off Active Duty or they would do it over the phone. I called my Commanding Officer and advised him of the situation. Within hours I was advised that I would be staying on Active Duty and assigned to the Wounded Warrior Barracks at Camp Lejeune, North Carolina.

While at the WWB I once again felt that I was an asset to a unit. I was back to being a Navy Corpsman taking care of Marines. I performed dressing changes, stump wound care, wound irrigation, and medical administration issues such as getting the Marines to their appointments or to the VA to begin their paperwork. Also while there, I went through different types of therapy and I received my MRI. It was then and finally then that it was discovered I was suffering from a severe TBI. All the medical centers I described above and not one had performed any sort of MRI, CT scan, or even an X-Ray. The VA in Chillicothe, Ohio, thought outside the box and set it up, but I was transferred before they could do the MRI so I had it done while I was at Camp Lejeune. It was then they discovered I had a loss of brain tissue in the parietal lobe as well as the occipital lobe (which works the eyes). I went through several neuro-psych exams to determine the extent of my injury, and after several tests, it was determined that the TBI was also a major cause in my loss of sight. The eye healed from the surgeries, but it was also the optic nerve that was damaged as a result of the TBI that was now a concern.

In September 2006, I was officially retired from the Navy, and I was rated at 100 percent disabled. While at Camp Lejeune I had already began my VA disability paperwork so, once I arrived in Ohio at my parent VA, I was one step ahead.

I ran into a problem, however. I couldn't see, so how was I going to provide for my family as a firefighter? The Associate Director of the VA in Chillicothe offered me the position of Patient Advocate. As he put it, "Who better to assist veterans than a veteran?"

Since returning to the VA as an employee and veteran, I have had to overcome some other barriers. Once I was working, I had trouble reading and getting around. Months after returning to work, I met my VIST Coordinator. I had no idea there was such a person. We met for about 30 minutes and he gave me a folder of papers and a hand-held magnifier. I hadn't seen him since until this last month. I understand that in Ohio the VIST Coordinator only comes to the VA once a week for a few hours at a time. He is a mobile VIST Coordinator. After my first visit with the VIST Coordinator I was placed in touch with Vision and Vocational Services from Columbus, Ohio, a nonprofit organization that helps those with visually disabilities and with total vision loss. Within weeks of meeting the people from this organization, I was evaluated and provided with several magnifiers, a large computer screen, a new desk, several computer programs, and new glasses. Whoa, VVS came through. After this had all happened, my VIST Coordinator called and advised me that I would be getting a CCTV, a monitor that enlarges print. I work everyday helping veterans in whatever way I can and now I have the equipment I need to complete these tasks.

In conclusion, it is my impression that there is still not a seamless transition between VA and DoD. I see evidence of this everyday in the VA system. Fellow combat vets are trying to enter the VA for the first time, still not sure of what to expect. I also would like to see a fully staffed TBI/EYE trauma center built so that other veterans like myself won't have to go months or years not knowing that the reason they are the way they are is actually due to a TBI. Right now I am on a registry. I'm a number, which isn't helping me or any of us who really need the one-on-one treatment from an actual TBI/EYE trauma center. Research, education, vocational rehab, adult daily living skills—these are all items that can come from such a facility. Staff the facility with eye specialists, neurologists, physicians' assistants, nurses, and rehabilitation specialists. The discovery of a TBI is the first step in a new life for an injured servicemember. The number of TBIs is growing every day and only a fraction of those exposed to explosions actually know when something is wrong. Thinking patterns, cognitive issues, memory problems, anger, and also vision problems. These are all issues related to TBIs. Once again, thank you.

**Prepared Statement of Thomas Zampieri, Ph.D.
Director of Government Relations, Blinded Veterans Association**

INTRODUCTION

Chairman Mitchell, Ranking Member Brown-Waite, and Members of the House Veterans' Affairs Subcommittee on Oversight and Investigations, on behalf of the Blinded Veterans Association (BVA), thank you for this opportunity to present our testimony on Traumatic Brain Injury (TBI) as it relates to vision. BVA is the only Congressionally chartered Veterans Service Organization exclusively dedicated to serving the needs of our Nation's blinded veterans and their families. The Association has been helping blinded veterans for more than 63 years.

BVA appreciates the invitation you have extended to Operation Iraqi Freedom (OIF) blinded veterans to share their stories today. Like other visually injured servicemembers, they have had to work through a bureaucratic system that does not even attempt to track, report, and provide a Seamless Transition of care for them. For nearly three years, BVA has tried to bring this issue to the attention of the Armed Services Committees, the VA Committees, DoD, and VA itself.

Of paramount concern are the growing numbers of those returning from battle with penetrating direct eye trauma as well as the increase in cases of TBI visual dysfunction. OIF and Operation Enduring Freedom (OEF) returnees trying to enter the VA healthcare and benefits system today should never have encountered such a difficult process. Quick administrative changes are now vital to correct this.

BVA wishes to make clear that the clinical skills of the DoD professional eye care providers have been deemed excellent. In many cases, outstanding ophthalmology surgery on the battlefield and in military facilities has saved partial vision of soldiers and Marines, a feat that could not have been possible in any previous wars. The weakness is in the administrative systems within both DoD and VA that account for the combat eye wounded and the TBI patients that need specialized vision screening.

PREVALENCE AND INCIDENCE OF VISUAL IMPAIRMENTS

As of February 26 of this year, there were 29,317 wounded in OIF/OEF operations, of which 8,904 required air medical evacuation. Another 8,273 military personnel injured in non-hostile action have also been evacuated from Iraq or Afghanistan. Between March 19, 2003 and September 17, 2007, 1,162 of those evacuated had sustained direct eye trauma. This means that 13 percent of all evacuated wounded had sustained direct eye trauma, the highest percentage of eye wounded in more than 160 years of American wars. Based on additional information that we have received during the aforementioned 4-year period, mostly anecdotal in nature, BVA believes that perhaps many more than 1,162 servicemembers evacuated from Iraq or Afghanistan have experienced direct eye trauma.

The top three contributors to combat eye injuries have been (1) Improvised Explosive Devices (IEDs), which caused 56.5 percent of the injuries, (2) Rocket-Propelled Grenades (RPGs), and (3) Mortars. The Landstuhl, Germany, Military Medical Center began a TBI screening program last May, reporting that 33 percent of all wounded were diagnosed with mild, moderate, or severe TBI. The Defense Veterans Brain Injury Center reports that from October 2001 through September 2007, 4,471 were diagnosed with TBI-injuries. The number of servicemembers who have actually sustained moderate-to-severe TBI injuries, to the extent that they are experiencing neurosensory visual complications, is essentially a guessing game. This is because emerging articles and surveys on TBI complications reveal updated numbers almost every month.

What most concerns BVA are studies revealing that 75 percent of those with TBI injuries also have complaints about vision problems. Approximately 60 percent of those injured have associated neurological visual disorders of diplopia, convergence disorder, photophobia, ocular-motor dysfunction, and an inability to interpret print. Some TBIs result in visual field defects with sufficient loss to meet legal blindness standards.

One early VA research study (2005) of OIF and OEF servicemembers who had entered the VA system with an ICD-9 (diagnostic code) search found 7,842 with a traumatic injury of some kind. Consistent with recent media articles and VA reports, the most common traumatic injury diagnoses were hearing loss and tinnitus (63.5 percent). Nearly 70,000 of the more than 1.3 million troops that have served in OIF and OEF are now service-connected for tinnitus while 58,000 are service-connected for hearing loss. A major cause of this epidemic of hearing loss (60 percent of the cases) is exposure to IEDs. The second most common VA diagnostic code was for visual impairment (27.9 percent).

During the past four years, and especially recently, BVA has attempted to find out just how many total OIF and OEF servicemembers have sustained a traumatic eye injury requiring evacuation. We have suspected that the number is greater than the reported 1,162 stated above. We have also tried to determine how many service personnel from each branch of the military have been diagnosed with a TBI visual dysfunction. The answer from DoD has been either that this information is unknown or that it cannot be shared. We have also been told “off the record” within the past two weeks that as of March 1, 2008, there have been 1,499 serious eye injuries requiring evacuation from Iraq. A total of 376 of the 1,499 are now legally blind in one eye.

Other retired military sources have indicated that another 3,000 men and women with eye injuries have been returned to duty in Iraq after treatment of eye injuries. Some experts have projected that 7,000–8,000 veterans who, if screened, would be diagnosed with some visual dysfunction. We submit to this Subcommittee that OIF eye injuries could well be classified a “Silent Epidemic” and that the dual sensory loss of hearing and vision complications from TBI are, respectively, the number one and two injuries from OIF and OEF.

NEUROLOGICAL IMPACT OF TBI DYSFUNCTION

Perception plays a major role in an individual’s ability to live life. Although all senses play a significant role in perception, the visual system is critical to perception, providing more than 70 percent of human sensory awareness. With hearing being another critical component, IED blast injuries can obviously impair markedly these two key sensory systems.

Vision provides information about environmental properties. It allows individuals to act in relation to such properties. In other words, perceptions allow humans to experience their environment and live within it. Individuals perceive what is in their environment by a filtered process that occurs through a complex, neurological visual system. With various degrees of visual loss comes greater difficulty to clearly adjust and see the environment, resulting in increased risk of injuries, loss of functional ability, and unemployment. Impairments range from loss in the visual field, visual acuity changes, loss of color vision, light sensitivity (photophobia), and loss of the ability to read and recognize facial expressions.

Although one can acquire visual deficits in numerous ways, one leading cause is injury to the brain. Damage to various parts of the brain can lead to specific visual deficits. Some cases have reported a spontaneous recovery but complete recovery is unlikely and early intervention is critical. Current complex neuro-visual research is being examined in an attempt to improve the likelihood of recovery. The re-training of certain areas and functions of the brain has improved vision deficits in some disorders. Nevertheless, the extent of the recovery is often limited and will usually require long-term follow-up with specialized adaptive devices and prescriptive equipment.

The brain is the most intricate organ in the human body. The visual pathways within the brain are also complex, characterized by an estimated two million synaptic connections. About 30 percent of the neocortex is involved in processing vision. Due to the interconnections between the brain and the visual system, damage to the brain can bring about various cerebral visual disorders. The visual cortex has its own specialized organization, causing the likelihood of specific visual disorders if damaged. The occipitotemporal area of the brain is connected with the “what” pathway. Thus, injury to this ventral pathway leading to the temporal area of the brain is expected to affect the processing of shape and color. This can make perceiving and identifying objects difficult. The occipitoparietal area (posterior portion of the head), is relative to the “where,” or “action” pathway. Injury to this dorsal pathway leading to the parietal lobe will increase the likelihood of difficulties in position (depth perception) and/or spatial relationships. In cases of injury, one will find it hard to determine an object’s location and may also discover impaired visual navigation.

It is highly unlikely that a person with TBI will have only one visual deficit. A combination of such deficits usually exists due to the complexity of the organization between the visual pathway and the brain. The most common cerebral visual disorder after brain injury involves visual field loss. The loss of peripheral vision can be mild to severe and requires specific visual field testing to be correctly diagnosed. In turn, a number of prescribed devices are frequently necessary to adapt to this loss.

Accompanying such complex neurological effects on the patient is the overwhelming emotional impact of brain injury on the patient and his/her family. BVA would ask Members of this Subcommittee to seriously consider the ramifications of such injuries. Brain injuries are known for causing extreme distress on family members who must take on the role of caregivers. According to a *New England Journal*

of *Medicine* report of January 30, 2008, TBI “tripled the risk of PTSD, with 43.9 percent of those diagnosed with TBI also afflicted with PTSD.”

At present, the current system of screening, treatment, tracking, and follow-up care for TBI vision dysfunction is inadequate. Adding visual dysfunction to this complex mix, especially if undiagnosed, makes attempts at rehabilitation even more daunting and potentially disastrous unless there are significant improvements soon.

VA LOW VISION AND VA BLIND REHABILITATION PROGRAMS

A positive note is that the challenges inherent in the growing number of returning OIF and OEF servicemembers needing screening, diagnosis, treatment, and coordinated Seamless Transition of services can be met, at least to some extent, by the existence of world-class VA Blind Rehabilitation Centers (BRCs). The programs provided at such centers now have a 60-year history.

In the larger picture of VA programs for blind and visually impaired veterans, BVA began working more than four years ago to ensure that VA expand its current capacity as the aging population of veterans with degenerative eye diseases requiring such specialized services continues to increase. Our organization has been particularly supportive of recent plans for intermediate and advanced low-vision VA rehabilitation programs on an outpatient basis. Several such programs are now opening with veteran-centered, vision-specialized teams providing the full range of services. Accompanying this effort is an emphasis by VA on outcome measurements and research projects within the Veterans Health Administration (VHA).

The VA approach of coordinated team methods for rehabilitation care has unlocked strategies for new treatment, providing the most updated adaptive technology for blinded veterans. VHA Prosthetics reports \$200,674 spent during FY 2003–07 on OIF/OEF blinded veterans who have required equipment and aids. The following three sections describe programs within an already existing system that DoD should utilize and coordinate with VHA. Doing so will ensure that veterans and their families receive the best care.

THE VISUAL IMPAIRMENT SERVICES TEAM (VISTs) AND BLIND REHABILITATION OUTPATIENT SPECIALISTS (BROS)

The mission of each Visual Impairment Services Team (VIST) program is to provide blinded veterans with the highest quality of adjustment to vision loss services and blind rehabilitation training. To accomplish this mission, VISTs have established mechanisms to facilitate more completely the identification of blinded veterans and to offer a review of benefits and services for which they are eligible. The VIST concept was created in order to coordinate the delivery of comprehensive medical and rehabilitation services for blinded veterans. VIST Coordinators are in a unique position to provide comprehensive case management and Seamless Transition services to returning OIF/OEF service personnel for the remainder of their lives. They can assist not only newly blinded veterans but can also provide their families with timely and vital information leading to psychosocial adjustment.

Seamless Transition from DoD to VHA is best achieved through the dedication of VIST and Blind Rehabilitation Outpatient Specialist (BROS) personnel. VIST Coordinators are now following the progress of 102 blinded OIF/OEF veterans who are receiving services. The VIST system now employs 99 full-time Coordinators nationwide. There are also 37 full-time BROS serving as the critical source of blind rehabilitation for OIF and OEF blinded veterans.

The VIST/BROS teams provide improved local services when veterans needing continued services leave inpatient BRCs and return home. Such veterans require this additional training due to changes in adaptive equipment or technology advances. Because of recent legislation, VA Blind Rehabilitation Service will establish 20 new BROS positions during FY 2008 and another 10 the following year. The creation of these additional positions provides VA with an excellent opportunity to deliver more accessible, cost-effective, and top-quality outpatient blind rehabilitation services.

ADVANCED BLIND PROGRAMS: VISUAL IMPAIRMENT SERVICES OUTPATIENT REHABILITATION (VISOR)

In 2000, VA initiated a revolutionary program to deliver services: Pre-admission home assessments complemented by post-completion home follow-up known as Visual Impairment Services Outpatient Rehabilitation (VISOR). The program offers skills training, orientation and mobility, and low-vision therapy for veterans who need treatment with prescribed eye wear, magnification devices, and adaptive technology to enhance remaining vision. Veterans returning from BRCs, especially those requiring additional outpatient assistance, seem to benefit most from a VISOR experience. A VIST Coordinator with low-vision credentials manages the program. Other key staff consists of certified BROS Orientation and Mobility Specialists, Rehabilita-

tion Teachers, Low-Vision Therapists, and a part-time Low-Vision Ophthalmologist or Optometrist.

According to VA Outcomes Project Research, patient satisfaction with the program is nearly 100 percent. VHA recommended and endorsed a plan for this delivery model within each VISN Network's Advanced or Intermediate Program. During a VISOR experience, medical, subspecialty surgery, psychiatry, neurology, rehabilitative medicine, pharmacy, physical therapy, and prosthetics services can all be consulted as needed within the VA Medical Center, effectively providing the full continuum of care. DoD and VA are now establishing the means by which clinical eye trauma information is shared through an exchange of electronic healthcare records.

Private agencies that offer blind rehabilitation rarely have the full medical and surgical subspecialty staffing that VA has within a single facility, meaning that veterans and families taking advantage of such services would be required to travel additional distances to receive other VA care, incurring wait times to see other specialists/consultants and delays in obtaining prescribed medications or new treatment plans. BVA also strongly recommends that private agencies utilized for services be accredited by the Commission on Accreditation of Rehabilitative Facilities (CARF) or the National Accreditation Council for Agencies (NAC) Serving People with Blindness or Visual Impairment, and that such agencies be required to utilize VA electronic healthcare records for clinical care. BVA asks further that agencies contracted for services meet specific outcome measurements.

INTERMEDIATE LOW VISION PROGRAMS: VISUAL IMPAIRMENT CENTER TO OPTIMIZE REMAINING SIGHT (VICTORS)

Another important model of service delivery that does not fall under VA BRS is the VICTORS program. The Visual Impairment Center to Optimize Remaining Sight is an innovative program operated by VA Optometry Service for more than 18 years. The program consists of specialized services to low-vision veterans who, though not legally blind, suffer from visual impairments. Veterans must generally have a visual acuity of 20/70 through 20/200 to be considered for this service. The program, entirely outpatient, typically lasts 3–5 days. Veterans undergo a comprehensive, low-vision optometric evaluation. They receive prescribed low-vision devices and are trained in the use of adaptive technology to optimize functional independence.

The Low-Vision Optometrists employed in the Intermediate Low-Vision programs are ideal for the highly specialized skills necessary for the assessment, diagnosis, treatment, and coordination of services for Iraq and Afghanistan returnees with TBI visual symptoms. This is because such veterans will often require long-term follow-up services. The programs will also assist the aging population of veterans with degenerative eye diseases. Such programs often enable working individuals to maintain their employment and retain full independence in their lives. They also provide testing for and research into the effectiveness of adaptive low-vision technology aids that have recently become available. In conjunction with a wide network of VA eye care clinics existing in VA medical centers nationwide, combined VIST/BROS teams and Intermediate/Advanced Outpatient programs can provide a wide network of specialized services for veterans and their families.

CONCLUSIONS

Serious combat eye trauma and visual dysfunction associated with TBI, and that affect OIF and OEF service personnel, have climbed to second in most common injuries from the two conflicts. If hearing loss and visual impairments (dual sensory injuries) are lumped together, they become the most common type of injury. We urge Members of this Subcommittee to request that DoD/VA provide for the full implementation of the "Military Eye Trauma Center of Excellence (ETCoE) and Eye Trauma Registry." Congress expected the three Defense Centers of Excellence (DCoE) included in the Wounded Warrior Act to be co-located in the same place so that multiple injuries could be diagnosed and treated more effectively. The establishment of the Mental Health Center and TBI Centers of Excellence, along with ETCoE in the same location, will substantially improve multidisciplinary coordination, treatment, rehabilitation, and research into eye trauma cases across the DoD and VA universes.

At present, BVA is aware that the new military TBI Center of Excellence and Mental Health Center of Excellence will be placed together at the National Naval Medical Center in Bethesda, Maryland. Groundbreaking has been scheduled, a director has been appointed, staffing has been approved for 127 full-time personnel, and funding has been set at \$70 million—all in preparation for the establishment of these two Centers. In contrast, important decisions regarding ETCoE, including its location, are still being debated in a variety of arenas and on various levels. BVA

is puzzled that two DCoEs are being fully implemented and funded while ETCoE seems left behind in the process.

As an example of “progress,” working groups of DoD/VA ophthalmologists and optometrists are developing a “computer registry” with data fields. This should not be considered the end product of the Eye Center of Excellence. DoD cannot spend more time trying to decide whether it will devote the full resources needed for a comprehensive, administratively effective DoD/VA Center.

Chairman Mitchell and Ranking Member Brown-Waite, BVA again expresses thanks to both of you for this opportunity to present our testimony. BVA believes that as we move beyond the 5-year mark of OIF, the government can do better than it has in the past for those who have returned home with life-altering sensory losses. The urgent need for DoD and VA to implement the Military ETCoE, in the manner Congress intended, is now. Veterans who have suffered combat direct eye injuries, as well as those with TBI visual dysfunction, are at risk for complications in the future. Glaucoma, cataracts, retinal detachments, and other associated complications are all potential problems that we can well expect. We again reiterate our concern for the dual sensory “hearing and vision loss veterans” who are caught up in this system. We hope that such individuals will most assuredly be entered into the clinical and/or administrative tracking system designed in the future.

Because the population of war wounded is widely dispersed geographically and long travel distances pose delays to follow-up care, BVA never intended that just one medical treatment facility be tasked with all eye wounded or TBI patients with visual dysfunction. We respectfully state that one “treatment center” is not sufficient. We request that House and Senate VA Committees require several Eye Centers of Excellence to coordinate the care and rehabilitation of our Nation’s blinded veterans who have sacrificed so much.

We would now be pleased to answer any questions that Members of this Subcommittee may raise.

RECOMMENDATIONS

The Secretary of Defense and Secretary of Veterans Affairs must appoint an Eye Trauma Acting Administrative Program Director and dedicated DoD/VA clinical/administrative staff teams. The appropriate personnel must secure immediate financial resources now in order to begin the full implementation of the Eye Trauma Center’s operations. They should then report back to this Subcommittee within 90 days. BVA strongly supports, within VHA, an Eye Trauma Program Assistant to work with the Office of the Chief of Ophthalmology and Optometry. Also appointed should be a designated clinical Eye Trauma Coordinator at all four Polytrauma Centers. A Physician Assistant similar to the TBI Team Coordinator at Walter Reed Army Medical Center could facilitate high-quality clinical care management and participate in research data collection for the ETCoE. All VA Polytrauma Centers should screen for and report all eye injuries to VHA and review previous cases so they can be tracked and followed.

The Military ETCoE must be patient- and family-centered, comprehensive, coordinated, and compassionate. It must provide genuine Seamless Transition, thus ensuring electronic bi-directional exchange of both inpatient and outpatient eye care clinical records that both DoD and VA eye care staff can update and share with the Veterans Benefits Administration. All DoD/VA case managers need updates on the various programs for TBI visual dysfunction, eye trauma, and family education and information regarding the locations of vision services within VA. VIST/BROS teams must be notified of all transfers of eye wounded and all TBI Centers must report data on these cases to VHA.

ETCoE should develop standards of care. It should also direct educational resources and training programs to DoD/VA eye care personnel on subjects relating to best clinical practices. The Center must also coordinate much-needed research on eye trauma and TBI visual dysfunction with DoD, VA, and the National Institutes of Health. Additional investigation is needed into the consequences of TBI visual dysfunction since many aspects of the long-term consequences of mild-to-moderate TBI in OIF/OEF veterans are still unknown. In addition, in order to ensure a smooth transition for veterans with visual injuries, VA should explore the means by which further assistance can be provided to immediate family members.

BVA also strongly supports the National Association of Eye Vision Research (NAEVR) position that eye and vision research funding must be expanded in the DoD/Congressionally directed Peer Reviewed Medical Research Program (PRMRP). The Association requests an increase above the \$50 million authorized this year. The request is being made due to the large numbers of combat eye-injured TBI veterans returning from Iraq and Afghanistan, many of whom already have been or will in the near future be diagnosed with visual dysfunction.

**Prepared Statement of Randolph S. Marshall, M.D., M.S.,
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New York, NY, on behalf of NovaVision, Inc.**

Neurologically related visual field defects (VFDs) can occur as a consequence of stroke, traumatic brain injury, or complications of brain surgery. VFDs can occur in one eye (ocular injury) or both eyes (brain injury), and range from partial loss of vision field to complete blindness. So much of human perception, learning, cognition, and daily activities are mediated through vision that visual loss of any sort can be devastating to patients' lives. In one study of stroke patients, for example, the probability of reaching relative independence (as measured on a standard disability scale, the Barthel Index) was diminished by 20% when a visual field defect is present, and the chances of walking >150 feet was reduced from 35% to 3%.¹

Until recently, the only clinically available treatments to assist patients with visual field cuts were prism lenses and oculomotor (eye movement) training. These approaches are "compensatory" in nature, in that the training relies on the acquisition of strategies to compensate for the impairment, rather than attempt to treat the impairment itself. Many current rehabilitation strategies work on the compensatory principle—for example learning to use a wheelchair when gait is impaired, or being trained to use the non-dominant hand to write if the dominant hand is weak. Although these compensatory strategies have an important role in getting the patient back to performing some activities of daily living, they leave untreated the impairment itself. There is growing evidence in the neuroscience community, however, that actual restoration of function through treatment at the level of impairment is possible, and can be accomplished through targeted behavioral, pharmacological, and brain stimulation techniques. These newer, targeted therapies are thought to work through "neuroplasticity," which is the ability of the nervous system to modify its structural and functional organization in order to respond to changes in one's environment or recover from injury. By working to reverse the impairment, a better ultimate outcome may be expected. It is in the category of impairment-targeted treatment that visual restoration therapy (VRT) is thought to work. Some initial data have been published from our lab regarding the brain reorganization that occurs early in the course of VRT treatment.²

Visual restoration therapy is a home-based, computerized visual stimulation treatment that was developed in the late 1990s by a neuroscientist in Germany, and introduced clinically in the U.S. in 2003. It is now being offered across an expanding number of academic institutions and clinics in this country. Columbia University Medical Center was among the first to offer the therapy in the U.S. Because of my lab's ongoing clinical research on mechanisms of stroke recovery, we were interested in participating in the VRT program from a clinical as well as scientific perspective. We have treated 67 patients to date, some of whom have participated in our research investigations.

Tracking the results of our patients from a clinical perspective, we find that approximately 50% of patients have a significant expansion of their visual fields, ranging from 3% to 20% (average 8.2%) absolute increase in detection of stimuli in visual areas that were previously blind. Furthermore, approximately 61% report subjective improvement, including faster reading speed, better mobility (e.g. bumping into things less), a return to previous hobbies, and overall improved visual function. Our results with regard to the visual field improvement are slightly lower than previously reported results,³⁻⁵ which were derived from NovaVision's automated visual field testing that patients perform at home at the end of each monthly module. The main reason for the discrepancy we have come to learn is that some patients acquire a compensatory strategy of briefly shifting their eyes toward the blind field in order

¹ Reding MJ, Potes E. Rehabilitation outcome following initial unilateral hemispheric stroke. Life table analysis approach. *Stroke*. 1988;19:1354-1358.

² Marshall RS, Ferrera JJ, Barnes A et al. Brain Activity Associated With Stimulation Therapy of the Visual Borderzone in Hemianopic Stroke Patients. *Neurorehabil Neural Repair*. 2008;22:136-144.

³ Kasten E, Bunzenthall U, Sabel BA. Visual field recovery after vision restoration therapy (VRT) is independent of eye movements: an eye tracker study. *Behav Brain Res*. 2006;175:18-26.

⁴ Kasten E, Wust S, Behrens-Baumann W, Sabel BA. Computer-based training for the treatment of partial blindness. *Nat Med*. 1998;4:1083-1087.

⁵ Poggel DA, Kasten E, Sabel BA. Attentional cueing improves vision restoration therapy in patients with visual field defects. *Neurology*. 2004;63:2069-2076.

to bring stimuli into their seeing fields. These rapid out-and-back eye movements (visual saccades) are often performed without conscious awareness on the part of the patient, and may be a consequence of the VRT training procedure itself. When these eye movements are controlled for using a specialized eye camera there still appears to be true visual field expansion, which is the primary goal of the therapy. It may turn out that a combination of visual field expansion and subconsciously trained saccades account for the improvements in visual function that patients experience.

In addition to visual field expansion, the VRT stimulation therapy appears to confer additional benefits in other realms of cognitive restoration, in particular sustained attention. One young man we treated, a 19-year-old who had suffered head trauma from a motor vehicle accident 3 years prior, gained attentional skills such that he went from a score of 8 of 9 measures on a test for attentional deficit disorder prior to starting VRT, to a score of 1 of 9 by the end of the therapy. Thus, improved global and directed attention, a common accompanying deficit in head injury, may be an important secondary benefit to VRT.

I would conclude that VRT has significant merit in the treatment of visual field defects following brain injury, and may contribute to improved functioning, both at the level of the visual impairment, as well as improvement of disability and quality of life.

**Prepared Statement of Mary Warren, M.S., OTR/L, SCLV, FAOTA
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on behalf of Performance Enterprises and Dynavision 2000,
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Background Information

Persons with acquired brain injuries often experience significant changes in vision and visual perceptual processing that affect the ability to take in and use visual information to complete daily activities.¹⁻⁴ Visual search, defined as the ability to scan the environment to locate targets and information, is a critical component of visual processing that is often impaired even in mild brain injuries.¹⁻⁴ Visual search can be disrupted by deficits in the visual field (hemianopsias and other field deficits), impairment of visual attention (neglect and hemi inattention), oculomotor impairment (double or blurry vision), or loss of vision in one eye (altering depth perception).⁴ Disruption of visual search creates asymmetry and gaps in the visual information the person gathers from the environment. The quality of the person's decision making decreases because the brain is not receiving complete visual information in an organized fashion and therefore is unable to effectively use this information to make appropriate decisions. Visual scanning speed also slows significantly, making it difficult for the person to acquire information from the environment in a timely fashion.¹ Deficient visual search can affect all aspects of daily living, however, the impairment is greatest for activities completed in dynamic environments where the person must be able to rapidly process visual information from a variety of sources.⁴ As a result driving and participation in community environments for work, shopping, leisure or social participation are often most affected.

Therapists, faced with the responsibility of rehabilitating clients with brain injuries so that they can drive and successfully engage in dynamic community activities, have looked for devices that will enable them to reestablish efficient and fast search strategies in their clients. The Dynavision, originally designed to improve the visuomotor skills of athletes, is one of the devices adopted and modified by rehabilitation specialists to provide that same training benefit to clients. Occupational therapists have used the device in rehabilitation since 1986 to address visual, cognitive and motor impairment in persons with acquired brain injuries. For persons with visual and visuomotor impairment the apparatus is used to train compensatory search strategies, increase visual search speed and efficiency, improve oculomotor skills such as localization, fixation, gaze shift, and tracking, increase peripheral vis-

¹ Zihl J. Rehabilitation of visual disorders after brain injury. East Sussex, UK: Psychology Press, 2000.

² Zihl J, Hebel N. Patterns of oculomotor scanning in patients with unilateral posterior parietal or frontal lobe damage. *Neuropsychologia*, 1997;35:893-906.

³ Mort DJ, Kennard C. Visual search and its disorders. *Current Opinion Neuro* 2003;16:51-57.

⁴ Kerkhoff G. Neurovisual rehabilitation: recent developments and future directions. *J Neurol Neurosurg Psychiatry* 2000;68:691-706.

ual awareness, visual attention and anticipation, and improve eye-hand coordination and visuomotor reaction time. For persons with motor impairment it is used to increase active upper extremity range of motion and coordination, muscular and physical endurance and motor planning. It has been successfully used to improve function in adults with limitations from stroke, head injury, amputation, spinal cord injury and orthopedic injury.⁵ Currently there are over 300 Dynavision units in rehabilitation clinics in the United States and 16 units have been added to VA programs within the last two years.

Description of the Dynavision Apparatus

The Dynavision (Figure 1) is an approximately 5 foot by 4 foot board containing 64 small red square target buttons arranged in five nested rings. Each button covers a single small light bulb that illuminates randomly when the device is in use. An LED (light emitting diode) display is situated just above the center of the training surface. The board is wall mounted and adjustable to accommodate users of different heights. A computerized display panel, printer, and membrane control panel are situated on the left side of the board. The control panel has 37 operating keys that control four modes, six light speeds, three working areas, four quadrants, 1–7 digits with displays of 1 to .1 second and run times of 30, 60 or 240 seconds.

With these numerous options, a variety of training and testing tasks can be generated using either self-paced or apparatus-paced modes. In the self-paced training mode (mode A), a target button illuminates in a random location on the board. The user must locate the light and strike it with the hand as quickly as possible. When struck, the light beeps and extinguishes and another target light appears in a random location on the board. The user proceeds to strike the target lights for the duration of the exercise. The numbers of light “hits” are recorded and displayed at the end of the run. In the apparatus-paced mode, the light is illuminated for a pre-selected period of time of 5, 3, 2, 1, .75 or .5 seconds. The user must strike the target within the pre-selected time to score a “hit.” Apparatus-paced exercises are more challenging than self-paced exercises.

The therapist selects different options to accompany the two modes depending on the needs of the user. Exercises can be pre-selected to run 30, 60, or 240 seconds. Longer durations are useful for working on maintaining sustained attention; shorter durations for exercises requiring high intensity performance. The board can be programmed so that lights appear within only one quadrant to challenge the user who may have difficulty scanning or reaching in a certain direction. The training surface can also be adjusted between use of the full board (lights in all five rings illuminate) the middle board (the inner four rings of the board illuminate) or the inner board (the central three rings illuminate). The middle and inner board surfaces are suitable for persons with limited upper extremity range of motion or strength. When the flash option mode is used, the LED display in the center of the board can be programmed to display from one to seven digits periodically during the exercise run. The user must call out the numbers while striking the target buttons, a task that requires the ability to monitor and shift visual attention smoothly between the central and peripheral visual field. This program option significantly increases the cognitive demands on the user. Other instructional variations can be used to increase the cognitive requirements of the training tasks. For example, the user may be asked to multiply or add the digits in the LED display while striking the lights on the board. Or, on B mode, the user may be required to refrain from hitting lights when they appear in certain areas of the board or to strike lights with a certain hand only.

On completion of an exercise run, the Dynavision prints out an analysis of the user’s performance, including a comparison of reaction time and accuracy in the four quadrants of board. This provides the clinician with objective data on the user’s strengths and weaknesses in performance and assists in evaluation, treatment planning and documentation.

Application of the Dynavision in Rehabilitation

The design of the Dynavision board in terms of size, button configuration, and number of program options enables the device to be used to treat persons with a range of capabilities and medical conditions. The simplicity and straightforwardness of the response required (striking the button) enables persons with limited comprehension to understand the demands of the task. The ability to limit presentation to the inner ring of lights, coupled with the ability to lower the position of the board permits use by persons with restricted upper body mobility and wheelchair users.

⁵ Klavora P, Warren M. Rehabilitation of visuomotor skills in poststroke patients using the dynavision apparatus. *Percept & Motor Skills* 1998;86:23–30.

Although precision in the striking the button is required, the button can be struck with any part of the hand such as the palm, fingers, or back of the hand. This allows persons with limited prehension from conditions such as quadriplegia, hemiplegia or amputation to successfully work the board.

Ability to select different speeds of stimulus presentation from the self-pacing of mode A to the automatic presentation of mode B enables use with persons with varying speeds of information processing. The Board in mode A can be used to facilitate visual scanning and increase visual reaction time in persons who have difficulty executing adequate search patterns due to oculomotor impairment, hemi-inattention and neglect, and hemianopsia. Mode B and the digit flash option can be used to challenge high functioning persons who must demonstrate rapid information processing and mental flexibility in order to resume demanding tasks such as driving, engaging in sports activities and work. Varying the length of the presentation from 30 seconds to 240 seconds allows the therapist to prevent fatigue in persons with limited endurance and also challenge sustained attention in persons who have difficulty maintaining vigilance. Both modes A and B can be used with persons with upper extremity limitations to increase active range of motion and coordination.

The most unique and important contribution of the Dynavision to rehabilitation is its capacity to challenge the efficiency and speed of visual search. The size of the Dynavision board automatically elicits a combination of head turning and eye movement, which is the natural scanning strategy used when searching the environment. The light buttons are identical which eliminates the need for discrete identification and elicits a more automatic visual search response. This capacity enables the Dynavision to develop the attention skills needed for driving, and orientation to and negotiation of the environment. One of the great advantages of the device as a tool specifically for the rehabilitation of wounded soldiers is its competitive nature. Dynavision drills are presented as games of skill by instructing the persons to strike as many lighted buttons as possible within the allotted time. This challenges the client to give their best effort each time. The device records and analyzes performance showing the client where deficiencies exist to enable the client to improve performance on the board. Clients can compare their performance and compete with each other. Because the device was designed for athletes, the lights can be programmed to move at very high speeds and it is impossible to beat the board, which draws out the competitive nature of young men who use it. Also because it is used to train athletes, less stigma is attached to the exercises as using the board is regarded as athletic training.

Evidence

Published research supports the validity and reliability of the device in rehabilitation.⁵⁻¹⁰ Most notably, Dr. Peter Klavora and his collaborators at the University of Toronto have published several studies on the ability of the Dynavision to predict driving performance in persons with brain injury and to rehabilitate driving performance in persons post stroke.⁷⁻⁸

⁶Klavora P, Heslegrave RJ, Young M. Driving skills in elderly persons with stroke: comparison of two new assessment options. *Arch Phys Med Rehabil*, 2000;81:701-705.

⁷Klavora P, Gaskovski P, Heslegrave R, Quinn R, Young M. Rehabilitation of visual skills using the dynavision: a single case experimental design. *Canadian J Occup Ther*, 1995;62:37-43.

⁸Klavora P, Gaskovski P, Forsyth R, et al. The effects of dynavision rehabilitation on behind-the-wheel driving ability and selected psychomotor abilities of persons post-stroke. *Am J Occup Ther* 2000;49:534-542.

⁹Klavora P, Gaskovski P, Forsyth R. Test-retest reliability of three dynavision tasks, *Percept & Motor Skills* 2000;80:607-610.

¹⁰Klavora P, Gaskovski P, Forsyth R. Test-retest reliability of the dynavision apparatus. *Percept & Motor Skills* 1994;79:448-450.

Figure 1: The Dynavision Apparatus

**Prepared Statement of Gayle Clarke, Chief Executive Officer,
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Introduction

Chairman Mitchell, Ranking Member Brown-Waite, and Members of the House Veterans' Affairs Subcommittee on Oversight and Investigations; on behalf of Neuro Vision Technology (NVT) I would like to thank you for this opportunity to present testimony on Traumatic Brain Injury (TBI) as it relates to vision.

Neuro Vision Technology Pty. Ltd. has developed the **NVT Neurological Vision Rehabilitation System** which specializes in the assessment, training and management of people with Neurological Vision Impairments ("NV Impairments") following traumatic brain injury. NVT provide the equipment and training to professional paramedical and rehabilitation staff who are then responsible for assessing and training the patient with neurological vision deficits.

No comparable equipment and training program exists internationally outside of Australia despite recognized need within the Acute and Rehabilitation Hospital sectors and blindness services.

Prevalence of Neurological Vision Impairments

Previous research indicates:

- ***Between 30% and 35% of the population diagnosed with acquired and traumatic brain injury suffer from associated neurological vision impairment¹***

NV Impairment can be a result of stroke or traumatic event such as a car accident or military injury.

NV Impairment rehabilitation in the past has “fallen through the gaps”. The primary vision impairment agencies such as the not for profit Blindness agencies and Blind Rehabilitation Centers (BRC) have either been unaware or have not invested significant resources in NV Impairment rehabilitation. Major stroke and rehabilitation hospitals have also neglected the need for a standardized functional visual assessment as part of a minimum standard of clinical care in the rehabilitation of brain injury.

Historically, rehabilitation programs have focused on the physical recovery (Physiotherapy programs), implementation of strategies designed to maximize independence in activities of daily living (Occupational Therapy programs) and Speech Therapy. The incidence of language deficits following TBI is equivalent to that of NV impairment following TBI, however, assessment and specific therapy to reduce the impact of NV impairment is currently not standard practice in the majority of rehabilitation programs. Assessment and training should immediately become part of the ***clinical standard of care for the rehabilitation of Neurological Vision Deficits***.

Some statistics which have been released by the Department of Veterans Affairs Polytrauma Unit and Western Blind Rehabilitation Center, Palo Alto, indicated that:

- ***“67% of polytrauma patients seen to January 2006 have a severe vision impairment”***
- ***“90% injured as a result of combat, have a severe neurological vision impairment”***

Definition of Neurological Vision Impairment

The most common field deficit following TBI is **Homonymous Hemianopsia** (HH); half of the vision is lost in both eyes. HH impacts on ***all areas*** of activities of daily living, writing, reading, shaving, eating, dressing and mobility in busy or unfamiliar areas.

Additionally patients can be unaware of the extent of vision loss which is call **Visual Neglect**. The patient may only eat half the food on his plate, shave half of his face, be disorientated in space because he only sees one side of the world, e.g. moving from his room to physiotherapy he sees one side of the corridor and on the way back only sees the other side and therefore thinks he is in a totally different place.

Patients can also suffer from **Visuo-spatial deficits** whereby they cannot recognize their environment no matter how familiar it was previously, they may not recognize familiar faces of their mothers, wives or family members. These patients quite often do not have a visual field loss or ocular motor problem and therefore it is extremely hard to diagnose.

NVT have developed a standardized Vision Rehabilitation System that offers an assessment, training, outcome measures, management and research solution for the rehabilitation of NV Impairment.

Rehabilitation of Neurological Vision Impairments

While clinical vision assessments may be provided by Optometrists and Ophthalmologists, these usually occur much later than other rehabilitation assessments, sometimes the delay can be as long as many months. Many of the more complex visual perceptual deficits go undiagnosed and untreated for even years.

World leading neuro-psychologists and professionals in neurological rehabilitation centers are outlining the real issue with neurological vision impairment. In research studies in the U.S. it has been disturbing to find published articles which outline the following:

¹ Zihl, Josef. “Oculomotor scanning performance in subjects with homonymous visual field disorders”, Visual Impairment Research 1999. Vol. 1, No. 1, pp 23–31.

- *“50% of the patients in a head trauma rehabilitation centre show visual systems disorders not assessed before, although most of the patients were chronic and had been treated in other hospitals previously”²*

This in part is due to vision assessment not being part of a clinical standard and partly due to the staff not being trained in appropriate assessment and rehabilitation techniques for neurological vision deficits.

Patients referred to Blind Rehabilitation Centers and/or Low Vision Clinics are often provided with programs designed for ocular disorders e.g. glaucoma, macular degeneration. Most staff have minimal understanding of the additional cognitive and physical deficits associated with traumatic brain injury and may provide ineffectual or inappropriate interventions.

It can be argued that Neurological Vision Rehabilitation Therapy should be provided by a specialized profession equivalent to traditional therapy providers such as Speech Therapists given that the incidence of vision deficits following TBI is equivalent to that of language deficits following TBI.

NVT Neurological Vision Rehabilitation System

NVT Vision Rehabilitation System is not just a device but a therapy intervention program that actively transfers skills learnt in early phase recovery into functional tasks graded for a variety of settings, thus catering for the different entry and exit levels of a patient's performance.

It is based on assessment and training therapy programs which have been successfully provided in acute and rehabilitation hospitals in Australia for over 20 years to clients suffering from a Neurological Vision Impairment due to Acquired and Traumatic Brain Injury.

The NVT Neurological Vision Rehabilitation System's main objective is to assess and train the patient in compensatory scanning techniques which can be transferred in all activities of daily living such as mobility, orientation, reading, personal safety and quality of life. It is designed for early intervention following trauma and to be conducted in an interdisciplinary setting to support other rehabilitation therapies.

The **Assessment** is holistic in its format and has many components including neurological behavior checklists, activities of daily living, functional vision screening, quality of life measure and mobility assessment. The **Assessment** also includes the **NVT Scanning Device** which displays various sequences of lights to diagnose the presence of visual field loss, scanning deficits and other visual perceptual deficits including visuo-spatial neglect. The light box has a series of colored lights spanning 1.8 meters in length to simulate the degree of scanning required for mobility tasks, such as crossing roads.

The **Training** is designed to provide scanning exercises that encourage use of residual vision in compensatory scanning techniques. The device is **portable** to allow training to be carried out in the acute hospital, rehabilitation hospital or the patient's home. **Therapy intervention** can be evaluated by using the standardized assessment component post training to demonstrate patient improvement by evidence based outcomes.

Attention to required **Research protocols** within the software, which are based on standardization of assessments and therapy, allow for comparisons between base level and post intervention over a number of outcome measures.

Validation in the form of clinical trial/trials with ethics approval, for comparisons between patients with immediate and delayed NVT Vision Therapy intervention has commenced and will be completed in 2009/10. The study is being conducted by an independent organization (the Royal Society for the Blind South Australia “RSB”) using patients drawn primarily from Stroke Rehabilitation Unit of the Repatriation General Hospital, Adelaide South Australia and in conjunction with Flinders University.

International interest in collaborative research has been marked and currently two grant applications have been lodged in the U.S. It is likely in the next six months another grant application in Scotland will be lodged.

Training of Rehabilitation Staff

An integral part of the NVT Neurological Vision Rehabilitation System is the training of staff in the use of the assessment and training protocols and tools. NV Impairment has been a neglected area of primary health care and coverage for many years. Brain Injury Rehabilitation programs have traditionally focused on physical, cognitive and language therapies and often ignore the impact of visual

²Gianutsos, R. “Vision rehabilitation following acquired brain injury. In: Gentile, M. ed Functional visual behavior. A therapist's guide to evaluation and treatment options. Bethesda, MD: American Occupational Therapist Organization, 1997:267–294.

deficits. This is due in part to the lack of quality assessment and therapy intervention tools.

The complexity of injuries, in addition to vision loss, made these cases challenging for vision rehabilitation programs, especially when the injury involved a traumatic brain injury. Staff are challenged because historically Blind Rehabilitation programs are designed to address the needs of an aging veteran population with age-related eye disease and ocular problems. Staff need to understand and be trained in recognizing the difference between ocular intervention and neurological vision impairment intervention e.g. brain not eyeball.

The advents of the Iraq and Afghanistan conflicts have highlighted Traumatic Brain Injury and subsequently the relationship of Neurological Vision Deficits. Rehabilitation professionals are realizing they are not equipped to provide support and training and see the NVT Vision Rehabilitation system as a concrete means of providing a standardized assessment and training program with built in outcome measures.

The NVT professional training program is delivered in a structured manner and provides VIST's, BROS and Occupational Therapists with:

- Theoretical aspects of Traumatic Brain Injury and the Cortical Vision System.
- Training in the use of the **NVT Scanning Device** as an assessment tool for determining the presence of Homonymous Hemianopia and/or visuo-spatial neglect.
- Training in the use of the **NVT Scanning Device** as a therapy tool for enhancing visual function.
- Skills that will enable the Vision Therapist to transfer these scanning strategies to the veteran's home and community setting.
- Comprehensive manuals, workbooks lecture notes to support the training program.
- Currently requires four weeks intensive face to face contact with service provider.
- Competency measured after three months practical experience.

The Palo Alto Blind Rehabilitation and Polytrauma staff, and the Tampa Polytrauma rehabilitation staff, who have trained with the NVT system rightly see themselves as world leaders in the area of Neurological Vision Rehabilitation and have already seen many success in the short time they have been working with veterans. They are finding many advantages in providing the Neurological Vision Rehabilitation programs as part of the comprehensive interdisciplinary rehabilitation service within the Polytrauma Rehabilitation Centers.

Overview of Case Studies

I have outlined briefly four veterans with **Traumatic Brain Injury** who have made good improvements in their visual functioning and rehabilitation following **NVT assessment and training** at Palo Alto since NVT training commenced in October 2006.

- **22 yr old Veteran** injured in Iraq by **IED**, Level 4 Coma Stim, suffering from right homonymous hemianopia, visual neglect, language deficits, and related cognitive issues, injured lower limbs, right hemiparesis.

Training intervention: *Over a period of four weeks the BROS was able to attain systematic scanning in intact field of view and in deficit field where there was a strong presence of visual neglect. Veteran's deficit right field of view was stimulated so that spontaneous scanning was initiated by the veteran. Other nursing and rehabilitation staff were provided with strategies for use in day-to-day therapy programs where vision rehabilitation could be integrated.*

- **24 yr old Veteran** injured in Iraq by **IED**, loss of limb, loss of speech, Frontal-parietal-occipital lobe damage, wheelchair mobility, bi-lateral visual field loss.

Training intervention: *On assessment this client was unable to travel safely or independently and was maneuvering his wheelchair from one side of the corridor to the other. He was disorientated in space and unaware of the need to scanning bilaterally to compensate for his field loss. Outcomes on training intervention included safe independent wheelchair mobility to therapy sessions, dining room and some outdoor travel.*

- **22 yr old female veteran** who was involved in a **motor vehicle** roll over in Germany, July 2006. Frontal lobe, bi-temporal, bi-parietal lesions and occipital craniotomy, visuo-spatial/perceptual deficits, quadrantanopia, hip and leg injuries, related cognitive deficits including visual inattention.

Training intervention: *The veteran had difficulties with spatial orientation and finding her way to therapy sessions. She was easily distracted and had balance and gait problems. On completing her vision rehabilitation training with the BROS at Palo Alto she was able to live independently, return to study, plan her weekly schedules and visit the local supermarket to do her weekly shopping.*

- Veteran injured in **Korea in 1951, gunshot** wound to the head, received no vision therapy until February 2007, has a remaining vision intact field of superior right quadrantanopia.

Excerpt from his testimonial: *On June 13, 1952, I was shot through the head during Korean war combat. The bullet went through the skull behind the ears, blew off the back of the skull, damaged the occipital lobe, and left me legally blind. I lost 75% of the visual field in both eyes. After a lengthy stay in an Army hospital, I was discharged without the benefit of any rehabilitative therapy for my loss of vision.*

Fifty-five years later I discovered the Veterans Administration Western Blind Rehabilitation Center (WBRC) in Palo Alto, California.

I was admitted to the Center on January 10, 2007: The staff and I soon realized that their standard program was geared to helping people suffering from vision loss due to eye pathology, not loss of vision due to traumatic brain injury.

Therapy for loss of vision due to eye pathology relies heavily upon magnification devices. A person with vision loss due to traumatic brain injury does not need magnification aids, but does need to be trained to bring those objects, which he may not see, into the undamaged portion of his visual field.

Upon realization that the normal curriculum at the Center was not appropriate for traumatic brain injury vision loss, Elizabeth Jesson, WBRC Director, removed me from their standard program and assigned Visual Therapist Scott Johnson as my coordinator.

Mr. Johnson employed a system developed in Australia by Gayle Clark entitled Neuro-Vision Technology. This system trains a person to move the undamaged portions of his visual field to cover areas where vision is unimpaired.

Even though I was 55 years late in receiving any visual therapy, I feel this system was beneficial. The Neuro-Vision Technology System would be even more successful if applied as soon as the WBRC becomes responsible for a veteran's rehabilitation.

Mr. Johnson has been assigned to develop a program for the WBRC utilizing the Neuro-Vision Technology System. This program will give the WBRC the capability of providing vision loss rehabilitation to the large number of veterans who have received traumatic brain injuries from roadside bombs and other explosive devices in the OIF and OEF.

Please lend your support and encouragement to this proposed program when it comes to your attention.

Sincerely,

Rodger L. Thisdell

Conclusions

The NVT Neurological Vision Rehabilitation System and was recently featured favorably in the *San Francisco Chronicle*.³ Staff have been trained in Australia and the UK including staff funded by the Scottish War Blinded. The current technology is targeted at improving mobility and functional field of vision via specialists in the rehabilitation, optometry and neuro-ophthalmology services.

The Department of Defense (DoD) and VA Health systems are seen as the gold standard in health services. The implementation of the NVT Vision Rehabilitation System within the VA Health system promotes the knowledge that it is a leader internationally in providing the best possible care for those veterans with TBI and related neurological vision impairments. It recognizes that Neurological Vision Impairment requires early assessment and rehabilitation intervention and that vision therapy is an integral part of the holistic rehabilitation required for the OIF and OEF servicemembers.

The NVT Neurological Vision Rehabilitation System's main objective is to assess and train the patient in compensatory scanning techniques which are then transferred into all activities of daily living such as mobility, orientation, reading, personal safety and quality of life. It is designed for early intervention following trauma and to be conducted in an interdisciplinary setting to support other rehabilitation therapies.

³Fernandez, E (2008) "New Treatments for Traumatic Eye Injuries," *San Francisco Chronicle*, March 9, 1.

It must be remembered that there is no “short cut fix” when talking about rehabilitation for Traumatic Brain Injury, in most cases this is a lifelong process, but experience has shown that early intervention and specific intervention for vision deficits improves quality of life, decreases the level of medical intervention and decreases the level of support required in the community setting once veterans are discharged from rehabilitation programs.

Chairman Mitchell and Ranking Member Brown-Waite and members of the Subcommittee, I would ask that you consider the following:

1. While clinical vision assessments may be provided by optometrists and ophthalmologists, these usually occur much later than other rehabilitation assessments. Sometimes the delay can be as long as many months. Many of the more complex visual perceptual deficits can go undiagnosed and untreated for even years.

Recommendation: The assessment and training of veterans with Neurological Vision Deficits should be implemented in the early stages of recovery and become part of the *clinical standard of care for the rehabilitation of Traumatic Brain Injury*.

2. Patients referred to Blind Rehabilitation Centers and/or Low Vision Clinics are often provided with programs designed for ocular disorders, e.g., glaucoma, macular degeneration. Most staff have minimal understanding of the additional cognitive and physical deficits associated with traumatic brain injury.

Recommendation: BROS, VISTs and Occupational Therapists be trained to provide Neurological Vision Therapy assessment and intervention programs in the interdisciplinary settings of Polytrauma, Polytrauma Network Sites and Blind Rehabilitation Centers.

Chairman Mitchell, I have spent 25 years of my life working as a clinician in the area of vision rehabilitation for patients with neurological vision impairments. I have seen many successes over the years and have many stories to tell. My key motivator is improving patient quality of life and as such I believe passionately that a comprehensive commitment to vision equipment such as Dynavision, Nova Vision and Neuro Vision Technology will provide internationally recognized, gold standard rehabilitation services to U.S. veterans whom deserve only the best.

Neuro Vision Technology strongly supports the recommendations of the Blinded Veterans Association and thanks you sincerely for the opportunity of testifying to the Subcommittee today.

**Prepared Statement of James Orcutt, M.D.
Chief of Ophthalmology, Office of Patient Care Services,
Veterans Health Administration, U.S. Department of Veterans Affairs**

Good morning, Mr. Chairman and members of the Subcommittee. Thank you for the opportunity to discuss the Department of Veterans Affairs' (VA's) provision of care for veterans needing support for visual impairment and traumatic brain injury (TBI). I am accompanied by Dr. Barbara Sigford, National Program Director for Physical Medicine and Rehabilitation.

VA and the Department of Defense (DoD) have a longstanding memorandum of understanding allowing VA to provide medical care and rehabilitative services for severely injured active duty servicemembers, such as those with blindness, traumatic brain injury, and spinal cord injury. The Veterans Health Administration (VHA) has developed one of the most extensive rehabilitation systems in the country for visual impairment, and our work in treating TBI, dating back to the creation of four national TBI centers in 1992, is unmatched. Our Polytrauma System of Care (PSC) is uniquely positioned to address the complex needs of veterans and servicemembers exhibiting these two conditions, and others, simultaneously. My testimony today will provide an overview of the continuum of care VA provides veterans and servicemembers to ensure they receive the right care, in the right way, at the right time, to further their goals of rehabilitation and reintegration.

VA has developed several initiatives to facilitate the ease of transfer for veterans and servicemembers transitioning from military service in Operation Enduring Freedom (OEF) or Operation Iraqi Freedom (OIF). For the seriously injured, ill, or wounded, VA and DoD have created a new Federal Recovery Coordination Program (FRCP) that will assign Coordinators capable of working within and between VA,

DoD and the private sector to monitor and support our severely wounded veterans and servicemembers. VA's OEF/OIF Case Management Program provides a fully integrated team approach at every VA Medical Center (VAMC), and includes a Program Manager, Clinical Case Managers, a Veterans Benefits Administration (VBA) Veterans Service Representative, and a Transition Patient Advocate. OEF/OIF veterans with severe injuries are automatically provided a case manager; all other OEF/OIF veterans are assigned a case manager upon request. Clinical Case Managers, who are either nurses or social workers, coordinate patient care activities and ensure all VHA clinicians are providing care to the patient in a cohesive, integrated manner. VBA team members assist veterans by educating them on VA benefits and assisting them with the benefit application process.

The Transition Patient Advocates (TPAs) serve as liaisons between the VAMC, the Veterans Integrated Service Network (VISN), VBA, and the patient. TPAs act as communicators, facilitators and problem solvers. The team documents their activities in the Veterans Tracking Application (VTA), a web-based tool designed to track injured and ill servicemembers and veterans as they transition to VA. VHA is also using the Primary Care Management Module (PCMM), an application within VHA's VistA Health Information system, to track patients assigned to an OEF/OIF Case Management team.

VA provides clinical rehabilitative services in several specialized areas employing the latest technology and procedures to provide our veterans with the best available care and access to rehabilitation for Polytrauma, TBI, visual impairment, and other areas. Whenever an OEF/OIF veteran requires specialized rehabilitative services, the assigned OEF/OIF case manager engages with the clinical case manager appropriate for that area of rehabilitation (e.g., polytrauma, spinal cord injury, blindness) and coordinates with the appropriate clinical case manager regarding the veteran's progress and rehabilitation.

Over the past two years, VA has implemented an integrated system of specialized care for veterans sustaining traumatic brain injury (TBI) and other polytraumatic injuries. The Polytrauma System of Care consists of four regional TBI/Polytrauma Rehabilitation Centers (PRC) located in Richmond, VA; Tampa, FL; Minneapolis, MN; and Palo Alto, CA. A fifth PRC is currently under design for construction in San Antonio, TX, and is expected to open in 2011. The four regional PRCs provide the most intensive specialized care and comprehensive rehabilitation available for combat injured patients transferred from military treatment facilities. As veterans recover and transition closer to their homes, the Polytrauma System of Care provides a continuum of integrated care through 21 Polytrauma Network Sites, 76 Polytrauma Support Clinic Teams and 54 Polytrauma Points of Contact, located at VAMCs across the country. Throughout the Polytrauma System of Care, we have established a comprehensive process for coordinating support efforts and providing information for each patient and family member. On February 27, 2006, VA established a national Polytrauma Call Center available 24 hours a day, seven days a week, to families and patients with questions. This Center is staffed by healthcare professionals trained specifically in polytrauma care and case management issues and can be reached by calling 1-888-827-4824.

The care coordination process between the referring DoD military treatment facility and the PRC begins weeks before the active duty servicemember is transferred to VA for healthcare. The PRC physician monitors the medical course of recovery and is in contact with the MTF treating physician to ensure a smooth transition of clinical care. The admissions nurse case manager maintains close communication with the referring facility, obtaining current and updated medical records. A social work case manager is in contact with the family to address their needs for psychosocial and logistical support. Before transfer, the PRC interdisciplinary team meets with the DoD treatment team and family by teleconference as another way to ensure a smooth transition. The PRCs provide a continuum of rehabilitative care including a program for emerging consciousness, comprehensive acute rehabilitation, and transitional rehabilitation. Each of our PRCs is accredited by the Commission on Accreditation of Rehabilitation Facilities (CARF). Intensive case management is provided by the PRCs at a ratio of 1 case manager per 6 patients, and families have access to assistance 24 hours a day, 7 days a week. The interdisciplinary rehabilitation treatment plan of care reflects the goals and objectives of the patient and his or her family.

From March 2003 through December 2007, the PRCs provided inpatient rehabilitation to 507 military servicemembers injured in combat theaters. The transition plan from the PRCs to the next care setting evolves as the active duty servicemember progresses in the rehabilitation program. Families are integral to the team and are active participants in therapies, learning about any residual impairments and ongoing care needs. The team collaborates with the family to identify the next

care setting, and determine what will be needed to accommodate the transition of rehabilitative care. The consultation process includes a teleconference between the PRC team, the consulting team, the family, and the patient. These conferences allow for a coordinated transfer of the plan of care, and an opportunity to address specific questions.

Before discharge, each family and patient is trained in medical and nursing care appropriate for the patient. Once a discharge plan is coordinated with the family, VA initiates contact with necessary resources near the veteran's home community. Based upon the patient's desired discharge location, a transition plan is prepared with one of the 21 VA Polytrauma Network Sites or another provider in the Polytrauma System of Care within the patient's chosen community. As veterans and servicemembers transition to their home communities, ongoing clinical and psychosocial case management is provided by a rehabilitation nurse and social worker from one of 76 Polytrauma Support Clinic Teams. VA social work case managers follow each patient within the Polytrauma System of Care at prescribed intervals contingent upon need. For example, there are four levels of case management: intensive case management, where contact is made daily or weekly; progressive case management, where VA contacts the patient monthly; supportive case management, quarterly; and lifetime case management, annually. For the many patients who are still active duty servicemembers, the military case managers are responsible for obtaining authorizations from DoD regarding orders and follow-up care based upon VA medical team recommendations.

VA reviews and improves our care for these wounded or injured warriors. VA assembled a national research task force last summer to review and evaluate the long term care needs of our most seriously wounded or injured returning OEF/OIF veterans. This task force recently completed its work and made several recommendations, which are being submitted to the Secretary for his review. Also, in compliance with the 2008 National Defense Authorization Act, VA is collaborating with the Defense and Veterans Brain Injury Center to design and execute a 5-year pilot program to assess the effectiveness of providing assisted living services to eligible veterans to enhance their rehabilitation, quality of life, and community integration.

We also co-hosted a conference in December 2007 with DoD on the visual consequences of TBI. This conference was attended by members of the visual team for each Polytrauma Rehabilitation Center as well as blind rehabilitation specialists, optometrists, and ophthalmologists from both Departments and provided an opportunity to initiate a consensus validation process, which will identify and disseminate the most effective strategies for treatment and services when they are known or to determine where additional research is needed. VA has also assembled teams of specialists, to develop questions for determining evidence-based treatments; we anticipate this process will be completed in the summer. VA holds an annual conference, portions of which are jointly conducted with Blinded Veterans of America (BVA), at which our experts and BVA representatives can discuss new treatment methods and further areas of cooperation.

Any OEF/OIF veteran seen at a VA medical facility is automatically screened for TBI. Veterans for whom the screen is positive are referred for a full, in-depth evaluation. The evaluation process includes a standardized evaluation template of common problems following brain injury. This template includes checks for visual impairment. Our visual treatment specialists conduct full visual examinations including but not limited to acuity, full visual field testing, pressures within the eye, and imaging of both the retina and the cornea to assess damage to these structures. In all, this screening process includes a 22-item checklist, including an evaluation for visual impairment and presence of visual symptoms. For veterans and active duty personnel with visual impairment, VA provides comprehensive Blind Rehabilitation services that have demonstrated significantly greater success in increasing independent functioning than any other blind rehabilitation program—anywhere. Currently, 164 Visual Impairment Service Team (VIST) Coordinators provide lifetime case management for all legally blind veterans, and all OEF/OIF patients with visual impairments. Additionally, 38 Blind Rehabilitation Outpatient Specialists (BROS) provide blind rehabilitation training to patients who are unable to travel to a blind center. These Polytrauma Blind Rehabilitation Specialists have certification in two areas, low vision rehabilitation and orientation and mobility training. They work in close collaboration with our neuro-ophthalmologists and low vision optometrists who evaluate, diagnose, and recommend treatment for our patients with visual impairments. Each Polytrauma Rehabilitation Center and Polytrauma Network Site has dedicated funding for a BROS on the Polytrauma team.

Blind Rehabilitation Service involvement often begins while the injured servicemember is still a patient at a military treatment facility. The patient is transferred

to a VA Blind Rehabilitation Center as soon as it is medically needed and at the patient's request. There is no waiting time for OEF/OIF veterans for this service.

The VA Blind Rehabilitation Continuum of Care, first announced in January 2007, further extends a comprehensive, national rehabilitation system for all veterans and active duty personnel with visual impairments. Program expansion during 2008 will add 55 outpatient vision rehabilitation clinics, 35 additional BROS at VAMCs currently lacking those services, and 11 new VIST positions. The continuum of care will provide the full scope of vision services—from basic, low vision services to blind rehabilitation training—across all Veteran Integrated Service Networks (VISNs).

This continuum of care will allow early intervention for patients whose vision loss results from progressive eye degeneration. Providing services at the earliest point in the continuum will maximize independence and substantially reduce demands on the family, community and VA. Providing a wider array of outpatient services across the continuum of visual impairment, coupled with the ability for a veteran to move through the continuum of care based on individual visual and psycho-social needs will reduce wait times for rehabilitation services. The continuum of care provides basic low vision services, intermediate low vision services, and advanced ambulatory low vision services in all VISNs. Advanced blind rehabilitation services are provided in all VISNs that do not already have an inpatient blind rehabilitation center.

VHA is expanding our capacity to provide care for the growing number of veterans returning from service in Iraq and Afghanistan with wounds and trauma resulting in blindness and visual impairment. We have provided additional funds to ensure visually impaired veterans receive appropriate care and the latest technological devices when needed and in locations convenient to them. To date, VA has provided inpatient blind rehabilitation services to 53 veterans and active duty servicemembers from OEF/OIF, while 156 OEF/OIF veterans and servicemembers have received some level of care from VHA Blind Rehabilitation Service.

VA has consistently been a leader in the development of sensory and prosthetic research aids. Each Blind Rehabilitation Center is actively involved in research, development and evaluation of devices. Many devices that were involved in research programs in past years are now regular features of service at our Blind Rehabilitation Centers. As new devices are crafted, VA will be among the first to evaluate them. Our goal in research and treatment is to improve the quality of life for all blind or visually impaired persons, veterans and non-veterans alike.

VA has been a national leader in the care and rehabilitation of veterans with TBI and visual impairments, and we are committed to maintaining that status. Thank you again for you the opportunity to meet with you today. I would be pleased to address any questions that you have at this time.

**Prepared Statement of Glenn Cockerham, M.D.,
Chief of Ophthalmology, Veterans Affairs Palo Alto Health Care System,
Veterans Health Administration, U.S. Department of Veterans Affairs**

Chairman Mitchell, Ranking Member Brown-Waite, and members of the Committee, thank you for the opportunity to testify. I am joined today by Dr. Glenn Cockerham, Chief of Ophthalmology at the VA Palo Alto Health Care System. We are here today to discuss our research on vision issues and traumatic brain injury (TBI). This research was conducted at the Palo Alto Polytrauma Rehabilitation Center (PRC) and Polytrauma Network Site (PNS) on a samples of just over 100 patients, including both veterans and active duty servicemembers. This is preliminary research and much more work needs to be done to determine conclusively the risks for this population and best clinical steps forward. My research has focused on two groups: first, veterans and servicemembers receiving inpatient care at the Palo Alto PRC who have sustained visual impairments associated with life-threatening polytrauma injuries; and second, outpatients receiving care at the Palo Alto PNS who have sustained visual dysfunctions associated with mild TBI.

While the inpatient and outpatient groups seem far apart in terms of the severity of their injuries, they have two common factors: the most common cause of injury to both groups is a blast event, and both groups have sustained a traumatic brain injury (TBI), although to varying levels of severity. Our preliminary research suggests both groups have rates of blindness, visual impairment, or visual dysfunction that appear to occur at rates higher than in prior conflicts.

During the Vietnam War eye injuries accounted for between 5% and 10% of all injuries. In the Persian Gulf War, eye injuries accounted for approximately 13% of

all casualties. The precise incidence of eye injuries occurring in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) are currently unknown. Preliminary data suggests these rates are at least comparable to the Persian Gulf War. Our research suggests that, in addition to injuries to the eye, damage to the visual system within the brain can create significant functional impairments for many troops and veterans.

In analyzing data from our early studies, exposure to a blast seems to be most closely associated with vision dysfunctions in the populations we have studied in Palo Alto. Among the 108 patients studied, those who have injuries stemming from a blast event are about twice as likely to have a severe visual impairment, including blindness, as are those whose injuries are caused by all other events. Overall 26% of this population is blind or has a best-corrected visual acuity of 20/100 or less or a very severe visual field loss. In other work done by Dr. Cockerham, looking specifically at veterans in the PRC with TBI caused by combat blast, significant abnormalities in visual function were found, despite normal or near-normal visual acuity by conventional testing. Rigorous eye examinations by ophthalmologists, including neuro-ophthalmology, detected significant damage to eye structures including cornea, retina, and optic nerve. In many instances patients were asymptomatic and unaware of underlying eye damage. In other patients in this population, problems such as double vision, inability to effectively track moving objects, and other visual dysfunctions are present. The consequence of these visual impairments and dysfunctions potentially impede independent functioning and may contribute to a reduced quality of life. Patients with traumatic eye injuries risk development of sight-threatening complications later in life and will require ongoing eye care. In addition, these visual impairments and dysfunctions can complicate other rehabilitation efforts and impair the individual's ability to pursue education, obtain employment, and social functioning. Most, if not all, of these conditions usually respond to therapy and rehabilitation, and the resulting disability can be minimized. VA's Blind Rehabilitation Service provides ample evidence of the effectiveness of vision rehabilitation treatment.

Our clinical observations suggest addressing these visual issues during the rehabilitation process can facilitate the rehabilitative efforts of other members of the rehabilitation team and can provide valuable information that may help families better understand the problems facing their loved ones. VA's Polytrauma Rehabilitation Centers recognized the importance of early intervention for visual impairment and structured interdisciplinary teams to include blind rehabilitation specialists as team members. In addition, the need for neuro-ophthalmology services was identified as a key consultative service.

Our preliminary research also suggests blast events may have significant negative effects on visual function, even when overall physical injury appears to be minor. Since early 2007, we have studied outpatients at the Palo Alto PNS clinic. These patients have been diagnosed with mild TBI and often have PTSD, persistent pain, and hearing impairment. We have gathered self-reported data and conducted visual screenings on 125 OEF/OIF patients served by the PNS clinic. Examination data suggests severe visual impairment is present in less than 2% of this population. However, data from optometric screenings suggest that as many as 40% of these patients have one or more binocular vision dysfunction symptoms. These binocular dysfunctions often manifest as an inability of the two eyes to effectively function together and may result in double vision eye fatigue, and other visual conditions which impair everyday visual function. When analyzing the self-reported conditions, more than 60% of these patients indicated an inability to perform sustained reading, and three out of four patients reported a vision complaint ranging from light sensitivity to eye strain and double vision. It is important to stress this is self-reported data and we cannot conclude the cause of these complaints.

In conclusion, I wish to emphasize our testimony is based upon findings from early studies with relatively small and selected population samples—this data is not definitive and conclusions should not be drawn from it. Instead, additional studies are needed and are ongoing. Uncovering these visual injuries and developing effective treatments has involved a collaborative effort utilizing the expertise and resources of many disciplines. VA's experience with vision related injury and impairment supports the claim that these patients can be effectively treated. Thank you again, Mr. Chairman, for inviting me today. At this time my colleague and I will answer any questions that you or other members may have.

**Prepared Statement of Colonel (P) Loree K. Sutton, M.D., USA,
Special Assistant to the Assistant Secretary of Defense (Health Affairs),
Psychological Health and Traumatic Brain Injury, and Director,
Department of Defense Center of Excellence for Psychological Health
and Traumatic Brain Injury, Department of the Army,
U.S. Department of Defense**

Mr. Chairman and distinguished members of the committee, thank you for your concern for our wounded warriors, especially those who have sustained ocular and vision impairment due to combat. As the Director of the newly established Defense Center of Excellence (DCOE) for Psychological Health and Traumatic Brain Injury (TBI), I have a strong interest in the creation and operation of the Ocular Center of Excellence due to the needed collaboration for those warriors who sustain ocular injury and vision impairment as a result of traumatic brain injuries.

The Department of Defense (DoD) is committed to providing excellence across the board in protection, prevention, diagnosis, treatment, recovery, and care transition for our military members and their families who sustain injuries or experience adverse health conditions as a result of the Global War on Terror. In accomplishing those objectives, we work hand-in-hand with our federal partners in the Department of Veterans Affairs (VA), the Department of Health and Human Services (HHS) and others, as well as public and private sector experts across the Nation and around the world. For our DCOE, we gratefully acknowledge the funding support from Congress to assist us as we move forward in providing our military personnel and military families with the care and support they deserve.

Overall, the Military Health System offers a continuum of care for medical specialties, which encompasses:

- Resilience, prevention, and community support services;
- Early intervention to reduce the incidence of potential health concerns;
- Deployment-related clinical care before, during, and after deployment;
- Access to care coordination and transition within DoD/VA systems of care; and
- Robust epidemiological, clinical and field research.

In centers of excellence, these facets of the care continuum are integrated, and, as a consequence, our patients receive more comprehensive and better coordinated care.

NDAA 2008 Requirements for Vision Care

Congress directed that the Department, in collaboration with the VA, plan for and establish a center of excellence that would build and operate the Military Eye Injury Registry. In fact, planning for that registry is underway by working groups comprised of military and VA subject matter experts. These specialty leaders recognize the value and contribution such a registry will make toward improved care and rehabilitation of their patients. Other registries are also underway within the Department including one for TBI. This registry once operational will track ocular and vision impairments associated with traumatic brain injuries.

In December 2007, DoD and VA sponsored a combined conference in San Antonio that focused on visual aspects of TBI, and DoD's tri-service consensus workgroup on Special Issues in mild TBI at medical treatment facilities included recommendations for visual screening for TBI patients. These recommendations currently are being staffed within the Department. On February 28, 2008, senior military health leaders met with their VA counterparts to discuss the concept and planning needed to establish an Ocular Center of Excellence. The general consensus was that the Ocular Center of Excellence should be a separate entity rather than combined with an existing center of excellence, but it must build strong collaborative relationships with the DCOE.

Moreover, Congress directed that the two Departments "conduct a cooperative program for members of the Armed Forces and veterans with traumatic brain injury by military medical treatment facilities . . . and medical centers of the Department of Veterans Affairs . . . for . . . vision screening, diagnosis, rehabilitative management, and vision research, including research on prevention, on visual dysfunction related to traumatic brain injury." The plan for the Ocular Center of Excellence will include such a cooperative program, and the DCOE will collaborate with the Ocular Center on these efforts. Moreover, a key responsibility of centers of excellence is to find programs throughout medicine, regardless of where, that have proven to be successful; then determine whether these programs demonstrate "best-practices." If they are, details on how to operate these programs will be disseminated throughout military and veterans' health systems.

DoD-VA Transition

We must effectively establish a patient- and family-centered system that manages care and ensures a coordinated transition among phases of care and between healthcare systems. Transition and coordination of care programs help wounded warriors and their families make the transition between clinical and other support resources in a single location, as well as across different medical systems, across geographic locations, and across functional support systems, which often can include non-medical systems.

In terms of transition, we seek better methods to ensure provider-to-provider referrals when patients move from one location to another or one healthcare system to another, such as between DoD and VA or the TRICARE network. This is relevant most especially for our Reserve component members.

Care coordination is essential for patients who may have multiple health concerns, multiple health providers, and various other support providers. Frequently, they are unsure of where to turn for help. Proactively, the DCOE will offer accurate and timely information on benefits and resources available. Meanwhile, the Army and the Marines have established enhanced care coordination functions for their warriors.

For Psychological Health issues and TBI, newly hired care managers will support and improve transition activities. The Marine Corps created a comprehensive call center within its Wounded Warrior Regiment to follow up on Marines diagnosed with TBI and Psychological Health conditions to ensure they successfully maneuver the healthcare system until their full recovery or transition to the VA. The Navy is hiring Psychological Health coordinators to work with their returning reservists, and the National Guard is hiring Directors of Psychological Health for each State headquarters to help coordinate the care of Guardsmen who have TBI or Psychological Health injuries or illnesses related to their mobilization. The other Reserve components are looking closely at these programs to obtain lessons learned as they set up their own programs. These many programs for easing the transitions of our wounded warriors serve as examples to build upon or to replicate as the patient demand requires.

Information sharing is a critical part of care coordination. DoD and VA Information Management offices are working cooperatively to ensure that information can be passed smoothly and quickly to facilitate effective transition and coordination of care. These offices will play significant roles in the establishment of the Military Eye Injury Registry and the TBI registry. This one endeavor is vitally important to the continuum of care for all of our wounded warriors regardless of their injury or health condition.

Research

Research and development provide a foundation upon which other programs are built. Our intent is to rely on evidence-based programs; our assessment identifies the need to develop a systematic program of research that will identify and remedy the gaps in knowledge. To that end, we have established integrated individual and multi-agency research efforts that will lead to improved prevention, detection, diagnosis, and treatment of deployment-related injuries and health issues.

At the DCOE, we will fund scientifically meritorious research to prevent, mitigate, and treat the effects of traumatic stress and TBI on function, wellness, and overall quality of life for servicemembers and their caregivers and families. Our program strives to establish, fund, and integrate both individual and multi-agency research efforts that will lead to improved prevention, detection, diagnosis, and treatment of deployment-related Psychological Health problems and TBI. We will collaborate with the Ocular Center on research that examines ocular injury and vision impairments as a consequence of TBI. The importance of this collaboration rests in the "miracle" of vision. Our visual track passes directly through the center of the brain. The visual cortex is so highly organized and the process of composing "vision" is so complex that it is truly a miracle that we "see." With physical and cerebral compromise, our ability to make fine tracking motions, use the eyes in perfect tandem, binocularly fuse objects, converge, diverge, and focus in tandem with fusion and eye movement easily may be upset. One can imagine how severe TBI might upset such an equilibrium that allows us to work, read, and view the world in comfort. Most of these visual dysfunctions are related to the elements of binocularity and accommodation and how those independent systems work in tandem. With recovery of the brain and overall physical health, we hope that most of these dysfunctions will return to normal. However, at this point, "we do not know what we do not know." Consequently, we have the compelling need for research and evidenced-based studies upon which we may base clinically sound programs.

Conclusion

Mr. Chairman, distinguished members, thank you for caring and for understanding the needs of our Warriors and their Families. Thank you also for providing the resources and support to design and implement programs to meet these needs. The military Services with the Army taking the lead, in collaboration with experts from the VA and public and private sector, will bring about an Ocular Center of Excellence that will offer our wounded warriors the integrated care and rehabilitation they need and deserve. It is an honor and a privilege for me to work toward improving and maintaining the health of those whom we serve.

