RECORD VERSION

STATEMENT BY

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Chairman Heck, Ranking Member Davis, and distinguished members of the subcommittee, thank you for the opportunity to speak about the sustainment of military trauma capabilities during peacetime. As a nation, it is our moral obligation to provide our wounded service members with the best possible trauma care. If American men and women are to be sent in harm's way, they should know that every effort has been made to maximize their chances of survival and to give them the best opportunity for a productive and happy life, should they be wounded. In order to fulfill this promise, our military needs both a cadre of trauma specialists and the means to keep them clinically proficient during times of peace. Importantly, the retention of specialists experienced in combat-related trauma is crucial to optimize patient outcomes, as that knowledge base cannot be earned by any means other than first-hand exposure. As Hippocrates said, war is the only proper school for surgeons.

There is a predictable drawdown of our armed force's trauma capabilities after the conclusion of an armed conflict. In the absence of a continued flow of casualties, fewer trauma specialists are needed, as very few Military Treatment Facilities (MTFs) address civilian trauma patients. Trauma specialists who leave the military are not necessarily replaced, and if many years pass before our nation's next conflict, the number of specialists remaining to care for our wounded may be less than desired. It can take several years to train additional trauma specialists, potentially causing a deficit in our trauma capabilities during the early years of that conflict. Moreover, those specialists that do remain on active duty during peacetime may encounter challenges maintaining their skill sets.

I am an orthopaedic trauma surgeon at Walter Reed National Military Medical Center. I have operated at every echelon of military surgical care: on an exam table at an Italian Role I in Afghanistan, in a Role II tent with a Forward Surgical Team, at the Role III in Kandahar, at the

Role IV in Landstuhl, and I am currently the Chief of Orthopaedic Trauma Surgery at Walter Reed. I have performed surgeries aboard a hospital ship off the coast of Papua-New Guinea, in antiquated operating rooms in Honduras and South Sudan, and by flashlight in post-earthquake Haiti. While the bulk of my career has been devoted to treating our nation's wounded, providing medical aid to those in need is also a powerful tool of diplomacy and is one of the hallmarks of an ethical society. I feel that my career, including combat deployments with both conventional and special operations forces, has given me insight into what it takes to become, and remain, a skilled orthopaedic traumatologist in America's 21st century military.

My first year at Walter Reed was the busiest year of the war in Iraq and Afghanistan. Two-thirds of all the multi-extremity amputees and two-thirds of all the genital amputees of the war came through our doors in those 12 months. I thought that my trauma fellowship had adequately prepared me to treat these casualties, but I was mistaken. Outside of industrial accidents, there is almost nothing in the civilian sector that can replicate the severity of combat wounds. The wounds sometimes defy description and the rules of treatment are often very different from those of the civilian trauma setting. A standard approach to the care of a motorcycle injury might be a guarantee of infection and amputation for a blast injury, even if the x-rays look the same. As a result, I feel that a military trauma surgeon needs to have two separate sets of skills: conventional trauma surgery and combat-related trauma surgery. Moreover, that surgeon needs a way to sustain those skills.

Conventional trauma surgery involves the treatment of injuries that are similar to those that occur in the peacetime military and the civilian sector. Not every wounded warrior gets injured in an IED blast, and there are many combat wounded who closely resemble their civilian counterpart, particularly those who were injured in armored vehicles or via low-energy

mechanisms. By their nature, these skills can be maintained by providing sufficient exposure to trauma patients or via continuing medical education (CME). Opportunities to continue a surgeon's education include sabbaticals to learn from world experts in limb salvage and trauma techniques, as well as attending conferences to learn current techniques and to exchange ideas with others in the field. Access to trauma patients on a regular basis could be achieved by one of two methods. One option is to allow trauma specialists to work at civilian trauma centers. The other is to allow certain military hospitals to treat civilian trauma patients themselves. The former is much easier to arrange, but the latter has the benefit of training everyone in the hospital in the treatment of trauma patients. The transition from peacetime to wartime will be easier on a hospital system and will improve patient outcomes if everyone is competent in conventional trauma care, not just the trauma specialists.

Combat-related injuries are potentially much more devastating than conventional ones, with much higher rates of infection and loss of function. For example, during the Surge in Helmand Province in the Spring of 2011, Walter Reed received a large number of blast-injured Marines who had fungus growing in their wounds. For a few months, it seemed that the majority of our patients were affected, and with time my colleagues and I became able to diagnose subtle infections based on the wound appearance alone and thus start treatment before the confirmatory tests were completed. Most civilian trauma surgeons will go their whole careers without seeing an invasive fungus-infected wound. We were getting a planeload of them three nights a week.

Military trauma patients are also different from their typical civilian counterparts, in terms of their baseline physiology and their expectations for their future. A wounded Marine is a wounded semiprofessional athlete who wants, and deserves, to be a productive member of society, to be able to play with his children and to be able to live his life proudly, not as an

invalid. When I came to Walter Reed, I had to unlearn all I knew about amputation surgery, as I had never before treated such catastrophic wounds in such active people. One of my patients and personal heroes is a Green Beret who just returned from Afghanistan as the first above-knee amputee deployed in a combat role, and I have created an Amputee Lengthening Program to enable very high amputees to walk for the first time. I mention these successes, not to speak about myself, but to show what is possible with hands-on experience with these injuries, and what would be impossible without it. Unfortunately, the sustainment of a combat-related knowledge base is extremely difficult during peacetime. Instead of sustainment, I believe the focus should be on retention, specifically preventing the "brain drain" of specialists with experience in treating combat wounds who might otherwise transition to the civilian sector over time. At a civilian center, a senior surgeon may have been in practice for up to 25 years or more. In the military, senior surgeons typically have less than ten years experience and are already transitioning into civilian practice. This comparatively short tenure leaves little time to impart the wisdom of experience on future generations of military surgeons. Since traumatologists comprise 5% or less of military orthopaedic surgeons, combat-wounded patients receive some or all of their care from non-trauma specialists on their journey from the point of injury to the operating rooms of trauma surgeons back home. Thus, it is imperative that all deployed surgeons are competent in the fundamentals of treating combat casualties, so that our wounded return home with the best chance of a good clinical outcome. Retention of our senior trauma specialists will help ensure the proper education of surgeons-in-training and non-trauma specialists, paying dividends in our military's future.

With modern advances in body armor and battlefield resuscitative techniques, American servicemen are now able to survive wounding mechanisms that would have been fatal to prior

generations of troops. While the internal organs are now much better protected, limited protection can be afforded to a soldier's arms and legs without compromising his or her mobility. This fact, combined with increased survivorship and the sophisticated bomb-makers on the modern battlefield, create pelvic and extremity injuries that push the limits of modern medicine with respect to treatment and reconstruction. The abilities of even the most seasoned trauma surgeons are tested as they attempt to restore function and quality of life to combat wounded, and these surgeons need to sustain their skills in *both* conventional and combat-related trauma techniques. Before I deployed for the first time, I was still able to conceptualize complex bony anatomy in three dimensions, being able to place implants through narrow safe corridors of bone through small incisions with minimal use of X-rays. When I returned, I found that I had lost that ability. It was like the difference between walking through one's home in the dark and walking through the home of a stranger. Two years of treating almost exclusively blast wounds, including six months spent in a tent in Afghanistan, had profoundly affected my conventional trauma skills. However, the casualty flow was no longer coming from Helmand and was instead coming from RC East, primarily involving soldiers injured while in vehicles. There was much more conventional trauma work to be done, as most of the soldiers were coming back without amputations, illustrating the variable nature of war wounds as OPTEMPO and theaters evolve. It took me six months to feel like my conventional trauma skill set was back where it should be, but I still have to fight to maintain my proficiency. I spend a weekend or two a month moonlighting at local trauma centers, in addition to paying my way to a pelvic trauma course every year and teaching at a number of civilian and military trauma courses throughout the year. Yet there are still some trauma surgeries that I no longer feel comfortable performing without assistance. Being a proficient traumatologist isn't like riding a bicycle. It involves very

perishable skill sets requiring fine motor skills and an understanding of spatial relations within the body, not to mention clinical judgment that slowly erodes with disuse. In my experience, it is easier to sustain these skill sets, rather than trying to relearn them when the time comes. While I cannot speak to the maintenance of proficiency in other specialties, I can tell you that there is no effective way to practice treating musculoskeletal trauma other than by doing it.

In closing, I think it is vital to view clinical expertise as a spectrum, as opposed to a binary system of adequate versus inadequate. Trauma specialists who are unable to sustain their skills may still be able to provide optimal outcomes to 80% of their patients, maybe more. But 80% is a B-minus, and our wounded warriors deserve A-plus surgeons. There's a reason that some of the Boston Marathon bombing victims came to Walter Reed for their care, and the collective expertise that our surgeons, wound care nurses, physical therapists and prosthetists have is in danger of dwindling as time goes on before our next armed conflict. If America goes to war in the next two years, there is no question that the quality of trauma care that our wounded warriors receive will far surpass that provided during the early years of our most recent conflict. That will not be the case if ten years pass before our next war. Not if history repeats itself and the personnel, skill sets and infrastructure of the military trauma system are allowed to fade away.

The sustainment of proficiency of our military's trauma specialists, and the retention of those with first-hand experience of treating combat wounds is paramount to the care of our wounded warriors. Some give all, all give some, and it is incumbent upon us as a nation to give them the best that we can in return. On behalf of my military trauma colleagues, and the wounded warriors that we serve, I thank you for your time and continued support.