

THE (IN)COMPLETE WARRIOR: TECHNOLOGY, LIMB LOSS, AND THE  
REFORMATION OF IDENTITY

by

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## **DEDICATION**

This thesis is dedicated to Arnie, JR and Chuck, the veterans who participated in this research. Without your stories this research would not have been possible. Though I have only known each of you for a short period of time, your tales have each inspired this research in unique ways. I cannot begin to thank you enough for your courage and your service.

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## **ABSTRACT**

Over the past century, American society has witnessed great advances in medical technologies. While innovations such as organ transplants, sonograms, and artificial prostheses are generally seen in a positive light, there are sometimes unforeseen ethical and moral issues that accompany their implementation. Within the medical system of the U.S. military these issues are compounded in unique ways. New surgical methods are allowing soldiers to survive and eventually recover from even the worst injuries, leading to an unprecedented number of U.S. combat veterans returning home from deployment missing one or more limbs. Through the application of advanced prosthetic systems, these veterans are not only able to recover but to return to or even exceed full physical functionality. The research presented in this paper explores the impact that medical technologies have on servicemembers, including how “useful bodies” are rebuilt through the application of medical technologies, and how the wounded veterans experience and perceive this reformation of identity. This phenomenological study of three veterans dealing with limb loss explores how the magnified drive for usefulness within the U.S. military compounds with new medical technologies to recreate useful bodies and rebuild personal identity.

## I. INTRODUCTION

As long as there has been war, there has been death and injury. With each new conflict the technologies and methods for killing have grown more advanced, and medicine has raced to keep up. At the start of the 21<sup>st</sup> Century, American and Allied forces declared a Global War on Terror; an insurgent war across multiple continents against an elusive new enemy. As the realities of fighting this new type of war settled in, the types of injuries incurred by military service members changed. The improvised explosive devices used by modern insurgent groups strike with little to no warning, and cause catastrophic injury to U.S. personnel. New body armor and combat rescue tactics ensure that many service members survive these massive injuries, but are left with damaged or missing limbs.

In order to counter this new trend in military limb loss, military medicine has invested heavily in prosthetic research. New installations like the Center for the Intrepid at San Antonio Military Medical Center were specifically built to develop new prosthetic technologies and rehabilitation methods. I have always been personally interested in military history as well as developments in military and medical technologies. This research project was a chance for me to research both my academic and personal interests as well as help provide the military medical community with anthropological data regarding the implementation of these new prosthetic technologies.

It is my hope that this research will add to the current anthropological literature regarding the use and implementation of new medical technologies. This thesis examines the cultural ideals of usefulness, masculinity and agency as they pertain to U.S. military



veterans dealing with limb loss, and how these ideals are affected by the presence of advanced prosthetic technologies.

This thesis has been written in an article format, rather than the traditional style. This format was selected so that I may more readily publish the results of this work, and receive feedback for future academic research. The following chapter is the basis of the article that I will submit for publication. Chapter III is a specific applied component that has been distilled from the main body of research in order to be more easily dispersed among the military medical community.

## **II. THE (IN)COMPLETE WARRIOR: TECHNOLOGY, LIMB LOSS, AND THE REFORMATION OF IDENTITY**

### **BACKGROUND**

Advances in medical technology have become increasingly frequent within the medical community, opening up many new possibilities that have never before existed. This is especially true when it comes to military medicine, which often operates at the cutting edge of medical care. While technologies such as new prosthetic limbs and limb salvage techniques are often regarded as remarkable, they can also have unforeseen consequences in how they affect the lives and perceptions of the people who employ them. Newly developed prosthetic systems, for instance, are capable of not only replacing a damaged body part, but in some cases surpassing the original physical functionality. This technological ability to repair the lost function of a body considered to be “incomplete” is unprecedented, and highlights modern western society’s emphasis on the creation of “useful bodies.” It is the goal of this study to explore how these technologies affect US military servicemembers as they work to rebuild their identities while recovering from limb loss.

#### Limb Loss and the U.S. Military

In response to the events of September 11th, 2001, the United States launched a series of military campaigns in the Middle East. Since the start of these wars, 2.2 million troops have been deployed to either Afghanistan or Iraq (Rutherford 2013). As of the end of 2013, 51,809 service members were wounded, including 1,558 who have undergone major amputation of arms and/or legs (Fischer 2014).

Around 60% of these service members are married with young families, less than 25% are able to stay on active military duty following their injuries, and only around 50% are employed following their medical discharges (Reiber 2010). Many are also plagued with chronic back pain, phantom pain, traumatic brain injury, and Post Traumatic Stress Disorder in percentages that are significantly higher than those reported among Vietnam combat veterans (Reiber 2010). While quantitative data is useful in outlining the problem, it does little in the way of describing the experiences of these veterans as they deal with traumatic bodily injuries, including how they experience the recovery process, how their injuries impact relationships with families and friends, and particularly how they perceive the medical technologies aiding in their recoveries.

Access to advanced medical technologies provided by the U.S. military paves the road to recovery for these wounded individuals. Advanced surgeries in Army field hospitals achieved survival rates of 98% during the Iraq war (Hnida 2010). While this figure is impressive, it also means that soldiers are surviving and returning home with far more severe wounds than in past wars. For those dealing with limb loss this means a long and arduous recovery process, often including multiple follow up surgeries, many hours of rehab, and learning to use prosthetic limbs.

### The History of Prosthetic Limbs

Prosthetic limbs have a long commercial history in the United States, dating back to the 1860's at the height of the American Industrial Revolution and the American Civil War. As limb loss due to the war and factory accidents became more common, companies that sold medical devices and aides began running ads showing men working

on prosthetic legs. The emphasis of these advertisements was that with these prosthetics a man could return to a full day of work. As women joined the industrial work force and began to lose limbs as well, these same companies put out new ads depicting female prosthetic arms complete with interchangeable cooking utensils at the ends, suggesting that the new prosthetic would allow women to return to being domestically useful (Reznick 2008).

Replacing a lost hand or foot with something that could be considered “better” from a utilitarian perspective can have far reaching consequences on the identity of an individual. Today, the technological abilities of modern prosthetics are so great, that in some cases army doctors expect these new parts to allow wounded veterans to not only meet, but to exceed their previous physical potential (Messinger 2010).

This idea is not a completely unfounded one. Olympic runner Oscar Pistorias had both legs amputated below the knees when he was 11 months old due to a medical condition. He grew up on prosthetic legs, and played rugby in school. After a knee injury, he switched to track, and began running on prosthetic running blades. These carbon fiber blades allowed Pistorias to compete against other runners with biological legs. His great success attracted attention, and studies were conducted by Peter Bruggemann (2008 in *Sports Technology* ) to determine what physical advantages (if any) were conveyed by running blades (Camporesi 2008). Results revealed that running on carbon fiber blades, Pistorias used 25% less energy to maintain the same speed as an elite runner on biological legs. This caused much controversy about his participation in the 2008 Olympic Games. Were the limbs therapy, or enhancement?

## Identity and Injury

This study is primarily concerned with understanding how new prosthetic technologies affect the identity of veterans dealing with limb loss during and after the rehabilitation process. In order to do this, it is important to understand some of the basic elements of service members' pre-injury identity. Military identity shares many aspects with Western competitive sporting identity in that they are both built upon the idea of overcoming physical difficulties in order to succeed. Armed service members are even referred to as "tactical athletes" who must use their highly conditioned physicality on a daily basis to meet the needs of the mission (Messinger 2010). Following a major injury, this large facet of identity is removed. Military medical care providers have put a great deal of effort into helping injured service members re-build this lost physicality, and expend resources far beyond what is available in the civilian world. With the new prosthetic technologies available to injured service members they are expected to be able to reach pre-injury levels of physical functionality. In fact, that is the standard by which recoveries are measured by military medical care providers (Messinger 2010).

## The Anthropology of Technology

In modern American society, the term "technology" is tossed about very casually. The usual view of technology, known as the Standard View, holds technology to be a necessary element of progress, and that the advancement of technology will allow people to live all around better lives, free from the constraints of the natural world (Lock 2004). There are two major assumptions surrounding this standard view. One assumption is that the relationship between humans and technology is too obvious to merit examination.

The second is that technology is an independent factor that is inherently good (Lock 2004). Neither of these assumptions should be unquestionably accepted. Technologies exist within a web of cultural, social, and economic forces that are in constant flux. Taylor (2008) uses the example of a computer to illustrate this point. To make the computer work, it requires a network of people, institutions and things. Also, the computer can be used for any number of things, useful or not. The technology has no inherent characteristics about it, only those assigned by the people using it.

This idea of technology being neutral is not a common one however. Because the standard view is so entrenched within modern society, many people do not care to question the use of technology. It is easy to look at a prosthetic leg, see that it allows someone to walk again, and think that is the end of the issue. Being able to walk again is good, so the technology must be good. Unfortunately, the case is not so simple. This shallow type of analysis fails to take into account the issues that amputees may face while dealing with their prostheses. It is possible (and even probable) that individual technologies have entire hosts of advantages and disadvantages regarding their use; for example, computerized prosthetic legs have capabilities beyond the traditional style of prosthetic leg, but rely on batteries to operate. In the end it comes down to the fact that individual technologies truly are neutral elements suspended within larger structures of meaning.

Anthropologists have also shown that medical technologies can raise ethical issues, have unforeseen cultural ramifications, and change the social and functional topography of biomedicine. Rayna Rapp, for example, conducts research on medical technologies and the effects they have on cultures, revealing tough situations that simply

do not occur to the casual observer. This is exemplified in her work on prenatal diagnosis and amniocentesis (Rapp 1998). The technological ability to diagnose a fetus's developmental problems in utero raises a moral dilemma among mothers. If a child is going to be born with a disorder, is it morally acceptable to undergo therapeutic abortion, or to not undergo a therapeutic abortion? Even the knowledge that the test exists can put stress on mothers, as they struggle with the decision of whether or not to undergo the procedure in the first place. This type of anthropological scrutiny is necessary in order to fully understand how technologies affect the complex world that we live in. Because veterans with limb loss live every day with their prosthetic technologies, it is important to ascertain what possible unforeseen ramifications come along with the use of these limbs.

Sharon Kaufman and Lesley Sharp have done research on the topic of organ donation showing that the technological ability to remove and repurpose organs has led to the commodification of bodies (Kaufman 2006, Sharp 2001). Modern surgical methods allow organs to be removed from one body and moved into another to replace a defective organ, much in the way that broken parts of machines are repaired. If the body is conceptualized as a machine, then damaged or missing parts can simply be repaired or replaced. Following the repairs, the body should be able to return to full working status (Foucault 1978). Today, medical technologies have advanced to the point where even the most grievous and life shattering injuries are survivable. The ramifications of this have been seemingly overlooked by the general public. Wounded servicemembers, for example, are expected to return to their previous identities as their bodies are 'mechanically' repaired (Messinger 2010).

The moral dilemmas brought up by Rapp are a side-effect of this ‘body as a machine’ ideology. When a new element is introduced to a mechanical system, the element will have a set certain affect. The rest of the parts either will or will not work with the new piece. Humans are far more complicated than this mechanical analogy allows for. When technologies are implemented on the body there are issues of cultural meaning that come into play that the mechanical analogy does not take into account.

These studies illustrate that implementation of medical technologies is not the simple matter the Standard View of technology suggests, and the relationship between humans and technology is far more complex than most assume. Medical technologies exist within a complex web of material objects, institutions, and perceptions within specific cultural contexts. Each of these studies delves into the interactions between technology and culture, problematizing the medical technologies and how they affect human populations. Given the increased emphasis on physical functionality within the U.S. military, it is important to understand how prosthetic technologies affect the identity U.S. service members dealing with limb loss.

## **METHODS**

This study examined the cases of US military service members who experienced limb loss. To clarify, limb loss in this case is defined as loss of use of one or more limbs, and includes limb salvage patients. As veterans with recent injuries, these service members have dealt with the latest military medical technologies along their paths to rehabilitation. Recruitment for this research was done through posted flyers and snowball sampling at several medical and therapy centers in and around San Antonio, Texas.



Brooke Army Medical Center is located in San Antonio Texas, and serves as a hub for a large system military medical facilities in the city. It is also home to the U.S. Army Burn Center, and the Center for the Intrepid; a one of a kind facility founded in 2007 to meet the needs of modern combat amputees as they re-integrate into civilian society. These high profile facilities have attracted many wounded veterans to the area, as well as civilian support organizations.

The Wounded Warrior Project was founded in 2003 as an effort to meet the needs of the newest generation of wounded combat veterans, and is one of the largest of these support organizations. Originally providing backpacks full of basic comfort supplies to wounded soldiers in military hospitals, the program has since expanded rapidly, and now provides support groups for veterans and families, helps veterans find jobs, and numerous other services.

Veterans Adventure is another wounded veteran support group in the area, with a presence in San Marcos, Texas. Veteran's Adventure teaches wounded veterans white water kayaking and hosts many competitive and team building events. This new style of "adventure therapy" has become increasingly popular over the past decade as a way for veterans to move past combat experiences and learn to live in the civilian world with their injuries.

Data for this project was primarily derived through interviews with veteran amputees. The interviews were unstructured and in-depth, with multiple (three to five) interviews taking place with each informant over a 3-6 month period. The purpose of the interviews was to gain an emic perspective of the veterans' experiences with medical

technologies after limb loss. In the most basic form, the interviews were broken into three primary parts. The first interview covered the informant's military service and the initial experience of limb loss. The second interview asked questions about the informant's medical experience immediately following limb loss including their experience in military trauma centers, the evacuation out of country, and the very first stages of recovery. The final interview covered life after discharge from the hospital until the current time, along with thoughts, feelings, and hopes for the future.

I subjected the resulting texts to phenomenological analysis. Phenomenology seeks to describe a very specific perceived reality as it is experienced by those involved (Starks 2007). In order to ascertain this reality, close reads of interview texts were conducted and memoing was done throughout the interview process. Interview questions were structured so as to get at the lived experiences of limb loss and the physical recovery process.

## **RESULTS**

Three veterans who experienced limb loss were interviewed for this study. Arnie served as an Aviation boatswain's mate aboard the USS Eisenhower during the Persian Gulf War where he suffered severe knee injuries working on the flight deck. Some years after discharge from service, he had his leg crushed by the bumper of a car that put him back into the care of the military medical system. JR served as an enlisted communication network specialist in Afghanistan with the Air Force. His leg was severely injured in what is assumed to have been an attack on his convoy. He was ejected from his vehicle and his leg was crushed. After years of rehabilitation and attempts to

save his leg, JR chose to have it removed in favor of a prosthetic leg. The last interviewee was Chuck, a recently retired Major with the U.S. Army Special Forces. While on a mission in the Middle East he stepped out the back of a transport helicopter and shattered his calcaneus, a large bone in the heel. After receiving medical attention it was discovered that Chuck had a rare type of bone cancer that had hollowed out his heel bone, making it very fragile. Treatment of this cancer included the amputation of Chuck's lower leg.

While the experiences of each these men are very different, there are certain key elements that link Arnie, JR and Chuck in their experiences with limb loss and medical technologies within the U.S. military medical system. It is important to note that these veterans and their experiences are not representative of every U.S. service member who has suffered limb loss. Arnie, JR and Chuck all had the opportunity to take advantage of the programs offered by the U.S. military medical system and pursued their rehabilitation vigorously.

The following is a composite narrative that details the essence of limb loss and the reformation of identity through the use of medical technologies within the U.S. military medical system. The story of "John" serves as a model for understanding the stages of recovery that the interviewed veterans dealt with after their injuries. While all limb loss cases are unique, this narrative provides a common ground for discussing the issues faced by each of the veterans interviewed.

*John is a U.S. Army Corporal injured while serving in Iraq. Days after his injury, John wakes up alone in a hospital room. He looks down at his sheet-covered legs dreading what discovery may await him. Pulling back the sheets he finds one leg missing*

*just below the knee and the other wrapped in heavy bandages and immobilized. Over the next few days, John contemplates his health, his family, his career, and his quality of life as doctors rush in and out of the room. Nothing is certain except for the next surgery. John is still not completely sure of what exactly happened that day while on patrol, and this new environment of clean, sterile hospital rooms is alien compared to the heat and dust of Iraq.*

*After a few months, John is discharged from the hospital and moved to a new facility to begin rehabilitation. After many surgeries, his left leg has been salvaged and is healing, but there are many complications. Much of the muscle and tissue is gone, and there is nerve damage. John finds that he has a hard time identifying with family and friends and that his relationships are strained. How can they possibly understand what this feels like? Frustrations mount over his inability to complete even the smallest daily tasks unassisted.*

*The situation is serious, but there is hope. With new prosthetic limb technology and the new external Intrepid Dynamic Exoskeletal Orthosis (IDEO) brace, John has a chance to not only walk again, but run a 5k, climb mountains, and ride motorcycles. This new hope cuts through the fog of confusion and uncertainty and gives him a goal to strive for. Every day of therapy is painful. Braces and prosthetic limbs need constant adjustment to keep up with any swelling and receding of the limb, but John pushes through it.*

*Some weeks later, John walks out of the hospital on his new legs. The constant dull pain in his limbs is a reminder of what he has worked hard in therapy to regain. His ordeal has given him a new appreciation for life and his sense of usefulness. Though*

*there may be tough times ahead, John is willing to deal with the pain and hard work to hold on to his newly re-constructed physical functionality.*

### Life Before the Injury: The Priority of Physical Fitness

Despite their very different backgrounds, Arnie, JR and Chuck enlisted in the military after high school for the same reason: it was the best available option for their future. They were all involved with various outdoor activities such as skateboarding, sailing, and hiking. This made military service an appealing option, as they believed that it would involve more of the same things they already enjoyed doing.

Upon arriving at boot camp, the veterans found that adjustment to the military lifestyle of boot camp was difficult: “As far as adjusting, I was 5’7”, and weighed maybe 125 pounds at the most when I went into basic. Just getting used to the physical requirements of doing what I was doing was extreme. Like, it was brutal at times, trying to get used to that.” -Chuck

Physical training (PT) took up a large portion of time in boot camp. Multi-mile runs were common, as were obstacle courses of varying difficulties. In this way, the rigors of boot camp worked to instill further physical ideals and values upon the newly enlisted troops. After graduation from basic training the new recruits were forged into examples of peak fitness: “The basic training methodology is that they bring you in and break you down both mentally and physically and then they get you where they want you and they build you back up to be soldiers, airmen, marines, sailors, whatever.” –Chuck

By physically and mentally breaking down new recruits and proceeding to build them back up is one way that the U.S. military creates a new common identity among

recruits. Much of this new identity is based on enduring the physical and mental hardships of military life. Recruits are placed in physically demanding situations and are expected to push through the pain and ‘suck it up.’

So I remember we were marching with weapons out to the range, I think. And we were foot marching along, and you know, I was a smaller guy and I had a hard time really keeping up with them as we were force marching, and I kind of stumbled a bit and stepped outside of the formation, and the Drill Sergeant basically punched me in the face and the helmet, which knocked me back and my head hit the rifle barrel of the guy next to me...and I just dropped, like, done. Knocked me out. I came to pretty quickly, and they were still marching, the guys just stepped over me, and the drill sergeants were just yelling at me ‘Get back in line! Get in Formation!’.”-Chuck

This mentality of pushing through pain and difficulty in order to perform can also be seen in the civilian sporting world. In the U.S. young males participating in sporting events are often told to “man up” and “push through the pain”. Additionally, failure to perform adequately sometimes results in jeers from team mates questioning masculinity. Common insults such as: “You hit/run/throw like a girl!” directly link failure to perform to a decrease in masculinity. The U.S. military relies heavily upon this mentality as it shapes the identities of new service members.

After boot camp the veterans were sent to schools where they learned to perform their specific jobs within the military. Arnie learned about life aboard a Navy carrier, and how flight deck operations worked. JR went through Air Force communications training, and Chuck went to infantry school to become a mortarman. Despite how different all of these jobs were, physical fitness remained a priority. Even after graduating from their

specialty schools and deploying with their units, sports and physical activity were some of the only ways to stave off boredom when not on duty:

In your twelve hour day I would always take my lunch to go to the gym and work out. It was something; it was a change of scenery. If you sit in the same spot forever every day of the week it gets old. I've never been to a place that made me work out, but it was encouraged because of the endorphins that it releases, it helps you be a little happier, things like that. The only time I've seen someone have to do physical workout, as far as lifting and stuff like that is if someone was getting out of shape. -JR

### Injury

The injuries experienced by the veterans interviewed in this study were diverse. Arnie had his leg pinned between the bumper of a car and a brick wall following a car accident. JR was thrown from a vehicle in Afghanistan and had his leg run over by an 18 wheeler in the convoy. Chuck shattered his calcaneus when stepping to the ground from an aircraft, later discovering that a rare form of bone cancer had hollowed out the bone making it very fragile. These traumatic events were turning points in the lives of those who experienced them. The sudden nature of these injuries shifted their lives off their planned courses and into unknown territory. In some cases, the actual events of the injury remain unknown to those involved: "All I remember is when I was thrown from the vehicle I was run over by an 18 wheeler. I remember a couple impacts and other than that I don't remember the next two days. I woke up in a hospital, and I'd been in a coma." -JR

While the event of the injury was traumatic, it was only the beginning of the injury-recovery process. As these service members endured their initial hospital time, uncertainty and stress began to mount as the veterans contemplated what their future might look like:

It's always hurry up and wait. Looking down and seeing that my leg was wrapped I knew that the leg was still there but not knowing the extent of the damage and things like that, was kind of stressful. I joke that 2007 was the year I went bald when I was 22 because that was the worst year of my life when I was stressed. Not knowing the outcomes and knowing that, you know, the doc said I'd never walk again and I'd never run again and things like that due to the extensive surgeries I've had to have on my leg. – JR

Having a damaged body in an environment that puts such strong emphasis on peak physical performance also brought about feelings of uselessness. This state of being unable to complete regularly assigned duties in the military is colloquially referred to as being “broke”. Arnie spoke at length of this concept of being “broke” regarding a previous debilitating knee injury that she suffered aboard the deck of an aircraft carrier: “You were treated like you were broken, and you were useless because you were broken. No you didn't want to go out of theatre. Hammer me with penicillin [and] get this shit over with and let me get back to my damn job. That's kind of the mentality when you're down in the ranks.” –Arnie. This concept provides another view into the mentality of usefulness/uselessness within the U.S. military. These veterans did not want to be broken, nor did they want the stigma of brokenness about them. This made it especially difficult for these veterans to come to terms with their newly damaged bodies, but it also fueled their desire to regain their physical functionality.

#### Early Rehabilitation: The Loss of Physicality and an Uncertain Future

After being stabilized following their initial injuries, the veterans were moved out of field hospitals to more specialized care facilities for the early stages of their rehabilitation. As the initial shock of the injury lessened, the veterans had more time to think about the reality of what had happened and were able to contemplate what the



injury meant for their lives. They also had time to ponder the unknown variables of the situation, such as what the injury meant for their future career aspirations (both military and civilian) and how the injury might affect their personal lives.

The knowledge of their lost physical functionality and the uncertainty of their abilities to recover were especially frustrating, as the veterans faced tough treatment decisions with life changing consequences. In Arnie's case, doctors salvaged his leg after the compound crush, but the leg was useless. After years of ineffective rehab and an old style leg brace that only exacerbated the problem, Arnie decided he had dealt with enough:

Things just kept degenerating. I got more and more pissed off because it meant I was spending more and more time with my leg up lying in bed and not being able to do anything. So finally I went to the VA and said "take it off". You know, the quality of life sucks. Give me an artificial limb because the artificial limb recipients they take the leg off and six weeks later they go walking out of the hospital. Here I've been 8 years with limb salvage and still can't do anything. So I told them to take it off.  
-Arnie

Fortunately for Arnie, there was one last chance for him to keep his leg. His therapists suggested a new type of brace known as the IDEO, which had all of the functionality of a fully prosthetic limb, but fit over his existing salvaged lower leg.

#### Medical Technologies: The Return of Usefulness

Before their intensive physical therapy began, however, the veterans were fitted for their new limbs. This process was unique to each veteran, as every injury is different. Due to the rigorous nature of the physical therapy, the veterans had to be re-fitted

multiple times to address minor issues, such as limb length imbalance, or “hot spots” where part of the prosthetic would rub against the injured limb causing fresh injuries.

It hurts a little bit when you're getting fit. When they first do the preliminary mold they want to get you in a position to where it doesn't hurt, and I have a very narrow range of motion before I go into agony. So, there's only about this much that I've got of flexibility before the muscles give out. It's about an inch, and inch and a half. That's all I can move before the muscles start protesting and I can't continue. –Arnie

Both IDEO limb salvage patients and amputees with full prosthetic limbs had to go through a long series of adjustments with their limbs as they learn to use them, and as muscle groups deteriorate or strengthen. Years after the initial injury or amputation the pain is still a constant presence: “It hurts all the time. In fact, if it ever stopped hurting then I'd be worried.”-Chuck

Even after learning to use their new limbs the veterans still had to adjust to the reality of living with them. After Chuck had gone through rehabilitation he returned to his unit to continue serving. Even small considerations became larger issues in the field. Wearing a socketed prosthetic leg in the heat of Afghanistan caused his leg to sweat, and the perspiration collected in the socket where his leg fit into the prosthetic. This caused an uncomfortable fit, and Chuck had to find a way to remove his prosthetic to drain it in the field. Initially, this meant he had to remove his pants to take the leg off, which was problematic during missions. Determined that the issue would not slow him down, Chuck modified his uniform pants so that he could open them up to remove the leg while keeping his pants on. This is a simple reality of living with limb loss; new problems arise and it takes determination and ingenuity to meet these challenges.

The veterans' internal drives for functionality coupled with the military's medical support and the availability of new medical technologies like IDEO helped Arnie, JR and Chuck to make excellent recoveries. These technologies opened new quality of life options that had previously been impossible. Before his IDEO, Arnie had been on arm crutches for years, but once he no longer needed crutches and could stand on his own new possibilities emerged: "Just doing things like being able to dance with Elizabeth (Arnie's wife). You know, I've only gotten one dance out of this whole relationship in seven years, but now we can go dancing. That's pretty damn big." When asked about medical technologies used in their rehabilitation and what it felt like using these prosthetic limbs, the answer invariably involved two specific points: The technology is wonderful, and the pain level is intense: "The technology was marvelous. Horribly painful, but marvelous."-Arnie

The availability of these new prosthetic technologies turned the tide of events by giving the veterans a degree of agency over their recoveries. As the veterans added new pieces of prosthetic technology to their bodies, they were no longer lost and they once again had a mission: to reclaim their physical functionality. These veterans underwent long hours of physical therapy, involving re-learning how to drive a car, walk up stairs, jump, and even run. These hours of therapy taught the veterans how to use their prosthetic limbs and solidify their grasp of their new physicality. "You start learning how to step over things, and step up on things and really learning how to use the IDEO and re-learning how to move. In my case, after 8 years, learning how to walk again. You're learning to trust your leg again, and that's a big deal."-Arnie

The physical pain experienced during and after therapy was a small price to pay in the minds of these wounded service members. The military drive for physical performance coupled with the “push through the pain” mentality of military identity couple to create a pressure encouraging physical recovery. Despite all of the aches and the twinges, these people were able to reclaim their lives and their physicality. Losing a limb changed each of these men in a unique way. It gave them a new perspective on their bodies, and what it is to be physically functional. While they still possess their military identities, they have all experienced a unique phenomenon that has changed how they view their physical functionality. “Honestly, I’m probably more outdoorsy now, with all of the hiking, kayaking and running. Before I lost my leg I did some of that stuff, but never to this degree.” -Chuck

The benefits of reclaiming physicality spilled over into the rest of the veterans’ lives as well. The versatility of prosthetic limb technologies means that new limbs can be created and interchanged to meet any need. Veterans with full prosthetic limbs have options for running legs, swimming legs, and even custom built limbs for riding motorcycles and wake boarding. With these tools and abilities the veterans were able to solidify their new identities as useful bodies and re-enter society, much of the negative emotions regarding their injuries faded:

In the five months since I’ve amputated my leg my happiness has gone up. My marital status has gotten better, because we were in marriage counseling and stuff like that, and my pain drove me to depression. I mean, you just get so depressed you have to go out and do stuff because it hurt so bad. I’m fortunate that I was able to have it [The amputation] by a doctor who was skilled enough to do this and I’ve become probably three times more active than when I had my damaged leg. -JR

In place of unsureness and worry that had plagued them early on in their injury process, these veterans have adopted a “can do!” attitude when it comes to their future. By losing the usefulness of their body and then earning that usefulness back through pain, hard work, and medical technologies, these men have gained new appreciation for even the smallest things in life:

It’s not all big grand things. Taking out the damn trash. Mowing my own lawn. Being able to dig a hole without having to hire someone to do it for you... Not everything is grand goals. They sounds like little things, but those little daily goals are as important if not more so than the big ones. Those are the goals that are the most exciting ones. Being able to meet these little goals is awesome. They’re the things that make life worth living; quality of life goals... They help get you out of the depression cycle. –Arnie

## **DISCUSSION**

Analysis of the veteran’s interviews revealed that their desire to regain physical functionality overrides their need for physical comfort. Because technology makes these veteran’s transformations possible, it is crucial that this phenomenon is understood in the context of the greater anthropological discourse of technology. While the interviewed veterans were pleased with their prosthetic technologies, these artificial limbs have created an economy of pain in which wounded veterans exchange pain for functionality.

### Military Medical Technologies in the Larger Technology Discourse

As previously stated, prosthetic limb technologies have a long history in the United States. The recent casualties of the conflicts in Iraq and Afghanistan initiated a new drive for improved prosthetic limbs within the military medical community. Backed by military funding, these technologies have advanced to

unprecedented levels, allowing previously unheard of recoveries to become commonplace.

The ability of these technologies to transform a heavily damaged limb into a fully functional limb is cutting edge, and generates much interest in both the medical community and the media. News outlets such as *Popular Science* often publish articles about new advances made in the field of prosthetic research, detailing the capabilities of new limbs and giving a basic overview of how they work and where they think the research will advance. As a result, much emphasis is placed upon the existence and capabilities of the technology itself rather than the person receiving the technology. However, this is not the case with the veterans who use these technologies on a daily basis. The veterans interviewed in this research discussed what they as individuals are now capable of, rather than the capabilities of the technologies themselves. Once implemented, these technologies become a part of the person using them; they become “my leg” rather than a piece of technology that they put on every morning. This is a seemingly minor but important distinction to make when it comes to the newly formed identities of these individuals.

In her research on amniocentesis, Rapp wrote of the problematization of technologies and the precarious moral positions they can put people in. While the three veterans interviewed are all happy with their limbs currently, the cultural framework in which their prosthetic technologies lie may shift with time. The technologically advanced prosthetic technologies used by these injured veterans are costly and complex. This leaves a question of future upkeep and maintenance.

As the program expands, will the military be able to guarantee to cover upkeep costs for the rest of veterans' lives? How will aging bodies react to the current prosthetics employed? As the regained functionality brought by these new limbs is such a crucial part of post-injury identity, it is important that future plans be made to support these technologies, both medically and financially.

It is easy for the public to mystify and idealize new technologies, but it is important to remember that technology has no inherent moral properties. All ascribed value is a result of the implementation of the technology in a certain context, for better or for worse. When medical technologies are implemented, it is a simple matter of transaction: to achieve X, one must give Y. In the case of amniocentesis, in order to gain knowledge regarding the health and development of a fetus, mothers must place themselves in the morally precarious position of potentially deciding to terminate a pregnancy based on knowledge gained from the test. Not all of these transactions are so complex, however. In the current cases of the veterans interviewed, the prosthetic technologies granted physical functionality in exchange for determined physical therapy and pain. These prosthetic technologies empower the veterans who use them, and are crucial tools in the rebuilding of physical functionality and the reformation of identity after injury.

As stated by Taylor, these technologies are neutral. In order to assure that injured service members are having all of their needs met, it is important that military healthcare see these technologies for what they are: neutral tools that may be implemented in recovery in order to enrich the lives of injured service

members. Arnie used an older lace-up style of leg brace for years prior to IDEO, and the frustration led him to ask his doctors to amputate his damaged leg. While the technology that had been tried on him worked for some people, it did not work in his case, and hurt more than helped. His case illustrates that not all technologies work well in all situations.

Taylor also notes that while technologies are neutral, they are situated within vast and complex webs of cultural meaning. The cultural meanings ascribed to these technologies can change from one group of people to the next. It is therefore important for researchers and healthcare providers to make an effort to ascertain the ascribed meanings in the specific context in which they are working. If prosthetic technologies are viewed as neutral elements within complex and fluid networks of meaning rather than as a catch all positive fix for all amputees, healthcare providers can more clearly understand the consequences of their implementation. The three veterans interviewed were pleased with their new limbs, but a number of issues they suffered through might have been avoided by placing higher emphasis upon the needs and requests of the patient, rather than focusing on making a particular technology work.

Every limb loss case is unique, and all of the potential options should be explored with consideration given to the desires of the individual. When service members lose a limb, the transition from regular duty to rehabilitation is drastic. The new world of hospitals and medical staff is very different from most regular duty stations. While doing their regular jobs, service members are confronted with problems where they must weigh different options and decide on what they think



is best. To have that element of choice removed from their lives regarding their health can lead to a sense of helplessness. Military medical care providers need to factor this into their treatment of these individuals, keeping the patients as informed as possible as well as bringing them further into the discussion on decision making. When JR was in the hospital following his injury, for example, he knew very little of what decisions were being made regarding his leg. Doctors simply informed him that it was time to prep for another surgery, and off they would go to the operating room. JR says that the year he was injured was the year that he went bald from the stress of his time in the hospital. If doctors and medical staff provide more information to their patients and bring them further into the decision making process service members may not feel so isolated and undue stress may be avoided.

### An Economy of Pain

The common themes that unite the experiences of Arnie, JR, and Chuck are their shared desire to return to full physical functionality and the pain involved in the use of their prosthetic limbs. Within military culture, where physical functionality and the ability to do one's duty is so important, these veterans have been placed in the position of purchasing functionality with pain.

Each veteran interviewed spoke at length about the pain involved in the surgeries, the rehabilitation, and the use of their prosthetic technologies. Despite this, they were all very pleased with the level of functionality that their technologies gave them. They have all become very intimate with the pain from their limbs, knowing just how much is normal, what is tolerable, and what is too

much. Standing on a prosthetic limb is painful, and running, jumping and climbing is even more so. The constant presence of this pain has become part of their post-injury identities, a subtle reminder of the cost of functionality. In spite of their pain, these veterans all pursue very active lifestyles that include running, hiking and kayaking; all thanks to their newly restored physical functionality . This transaction of physical functionality for pain is one that all three veterans were willing to make during rehab, and continue to make each day that they use these technologies.

While the veterans interviewed have come to live with the pain, this may not be representative of all injured veterans. Arthur Kleinman (1988) writes on chronic pain and a process referred to as somatization. This process is a sort of positive feedback loop, in where chronic pain adds to the stress of other life issues, which then makes the pain worse. It is important that injured veterans be made aware of how physical ailments can compound with mental pressures, leading into potential depression.

As veterans become accustomed to this high level of pain, a number of complications may arise. Chuck, who now works as a civilian contractor at the CFI spoke of the issues that he has witnessed in others that accompany injured veterans in constant pain. Learning to ignore pain means that serious health issues related to the limb may go unnoticed or unmentioned for long periods of time, leading to further medical issues with the damaged limb. Also, veterans with limb loss may under-rate the severity of other health issues when describing their pain levels to healthcare providers.

## Moving Forward

While pain is a factor that these veterans were able to deal with on an individual level, there are some elements of the recovery process that can be improved. During the early stages of recovery, the sense of confusion and lack of information took a heavy mental toll on the injured veterans. Not knowing what would happen to their futures and a lack of information lead to a feeling of helplessness regarding their situations early on in their recovery processes.

In order to combat this, healthcare providers need to inform their patients and their patient's support networks of all of the potential options early on, and need to make an effort to ensure that all options are available, medically permitting. After his injury, JR spent years dealing with a damaged leg before he was able to find a doctor with the proper qualifications who was willing to do his amputation. While JR is very happy with the result, he would have been a good candidate for the IDEO program, but it was unavailable to him due to where he was stationed. Because of the unique nature of each injury and the unique needs of individual service members it is important to offer as many treatment options as possible.

Exposing injured service members to the potential capabilities of new technologies may give them a sense of hope to hold on to; a drive that they can use to combat depression and focus their energies on rehab. This was certainly the case with Arnie, who after starting work with his IDEO began training to compete in competitive kayaking events. With a complete body and knowledge of his new capabilities, he was able to focus on his new physical goals and win the gold

medal in a veteran's Paralympic event. Knowing early on that things can get better and that there are multiple options for their future offers these veterans a sense of agency early on in their recoveries and hopefully mitigate the sense of confusion and loss early on in the recovery process.

## **LIMITATIONS**

As this study looked into the cases of only three individuals, this data is not necessarily representative of all veterans dealing with limb loss. Not all veterans have the same treatment options as Arnie, JR and Chuck. Others may decide against pursuing a rebuilt physicality, opting instead to pursue other aspects of life. Participation in this study was strictly voluntary, and participants were all involved in voluntary recreational activities at the Center for the Intrepid. As a result, there were no veterans who had dealt with an overall bad experience in the volunteer population. Further research is necessary to better understand the overall experience of limb loss within the U.S. military.

## **CONCLUSION**

Arnie, JR and Chuck were each injured in their own unique ways, but their experiences unite them in their drive to re-attain the useful functioning of their bodies. Using new innovative medical technologies and great effort, they have achieved that goal, and then some. As these three men are all successful cases of rehabilitation after limb loss it is important that the military medical community take note of their experiences with new medical technologies and their journey through recovery. Knowledge of the intimate details of their rehabilitation and the technologies involved

may help U.S. military medical care providers understand what made these recoveries successful and help to hone the effectiveness of U.S. military medical programs for future wounded warriors.

### **III. APPLIED COMPONENT**

In order to provide the best possible care for injured veterans, it is important that military healthcare providers understand the ordeals faced by these service members, and how these ordeals affect identity. The following paragraphs are suggestions regarding how military medical care providers involved with limb loss can improve the quality of veteran care during the recovery process. This information will specifically be presented to the staff of Veterans Adventure, as well as to some of the physical therapy and adaptive sports workers at the Center for the Intrepid.

Immediately following injury, the transition from active lifestyle to being stuck in a hospital room is a drastic change. It is during this time that all sureness disappears; the present and future quality of life is in limbo. Veterans undergo great stress as they wrestle with all of the new unknowns in their lives. Worries such as: “Will I ever walk again? How will my friends and family react? What about my career?” are constantly present and can negatively influence the recovery process at the very beginning. To combat this problem, healthcare providers need to bring up the topic of new prosthetic technologies and the potential for recovery as soon as possible. Making veterans aware of the possibilities of rehabilitation using prosthetic technologies may give veterans a goal to work toward. Giving veterans options, keeping them informed on their condition, and showing them the possibilities of physical recovery will help to replace the confusion and sense of loss with a goal and sense of purpose during the early stages of the recovery process.

It is also important that the non-physical needs of injured veterans are being met during treatment. While being able to run and jump and climb are all excellent goals, these physical abilities are only one aspect of a veteran's newly constructed identity. The prosthetic technologies involved in the recovery process proved to be very effective in the three cases studied, and allowed the veterans to return to athletic pastimes that would have otherwise been impossible, but as Arnie stated, it isn't all about the big things. The ability to participate in a sporting event is great, but being self-sufficient and physically independent is more important. In order to better meet the needs of injured service members, rehabilitation processes should focus on individual identity as well as physical functionality, and realize that while the two are closely linked with many veterans, they are not the same thing.

While things may be working out well for injured veterans and their current prosthetic limbs in the present, it is important to think about extended care. Many of the limbs used by veterans at the Center for the Intrepid are very specialized and new, requiring expert care. How might this affect veterans as they grow older? With the rising demand for these technologies, will the U.S. military medical system be able to afford the upkeep of these limbs for the rest of veteran's lives? How will aging bodies react to current prosthetic technologies? Injured veterans and healthcare providers need to contemplate all of these questions in order to assure that the proper measures are in place.

## LITERATURE CITED

- Baiocchi, Dave.  
"Measuring Army Deployments to Iraq and Afghanistan." *RAND Corporation*, 2013.  
[http://www.rand.org/pubs/research\\_reports/RR145.html](http://www.rand.org/pubs/research_reports/RR145.html).
- Camporesi, Silvia.  
"Oscar Pistorius, Enhancement and Post-humans." *Journal of Medical Ethics* 34, no. 9 (July 14, 2008): 639. doi:10.1136/jme.2008.026674.
- Fischer, Hannah.  
*A Guide to U.S. Military Casualty Statistics: Operation New Dawn, Operation Iraqi Freedom, and Operation Enduring Freedom*. Report. Congressional Research Service, 2014.
- Foucault, Michel.  
*The History of Sexuality*. New York: Pantheon, 1978. Print.
- Hnida, Dave.  
*Paradise General: Riding the Surge at a Combat Hospital in Iraq*. New York: Simon & Schuster, 2010.
- Kaufman, Sharon R., Ann J. Russ, and Janet K. Shim.  
"Aged Bodies and Kinship Matters." *American Ethnologist* 33, no. 1 (2006): 81-99.  
doi:10.1525/ae.2006.33.1.81.
- Kleinman, Arthur.  
*The Illness Narratives: Suffering, Healing, and the Human Condition*. New York: Basic, 1988. Print.
- Lock, Margaret.  
"Biomedical Technologies." In *Encyclopedia of Medical Anthropology: Health and Illness in the World's Cultures*, edited by Carol R. Ember and Melvin Ember, 86-95. Vol. 1. New York, NY: Springer, 2004.
- Messinger, Seth D.  
"Getting Past the Accident: Explosive Devices, Limb Loss, and Refashioning a Life in a Military Medical Center." *Medical Anthropology Quarterly* 24, no. 3 (2010): 281-303.  
doi:10.1111/j.1548-1387.2010.01105.x.
- Rapp, R.  
"Refusing Prenatal Diagnosis: The Meanings of Bioscience in a Multicultural World." *Science, Technology & Human Values* 23, no. 1 (1998): 45-70.  
doi:10.1177/016224399802300103.



Reznick, Jeffrey S.

"Beyond War and Military Medicine: Social Factors in the Development of Prosthetics." *Archives of Physical Medicine and Rehabilitation* 89, no. 1 (2008): 188-93. doi:10.1016/j.apmr.2007.08.148.

Rutherford, George.

*Returning Home from Iraq and Afghanistan: Readjustment Needs of Veterans, Service Members, and Their Families*. Report. Washington D.C.: National Academy of Sciences, 2013.

Sargent, Carolyn Fishel, and Thomas M. Johnson.

*Medical Anthropology: Contemporary Theory and Method*. Westport, CT: Praeger, 1996.

Sharp, Lesley A.

"Commodified Kin: Death, Mourning, and Competing Claims on the Bodies of Organ Donors in the United States." *American Anthropologist* 103, no. 1 (2001): 112-33. doi:10.1525/aa.2001.103.1.112.

Starks, H., and S. Brown Trinidad.

"Choose Your Method: A Comparison of Phenomenology, Discourse Analysis, and Grounded Theory." *Qualitative Health Research* 17.10 (2007): 1372-380. Web.

Taylor, Janelle S.

*The Public Life of the Fetal Sonogram: Technology, Consumption, and the Politics of Reproduction*. New Brunswick, NJ: Rutgers University Press, 2008.