

**Architecting the Future Telebehavioral Health System of Care in the  
United States Army**

by

**Andrea K. Ippolito**

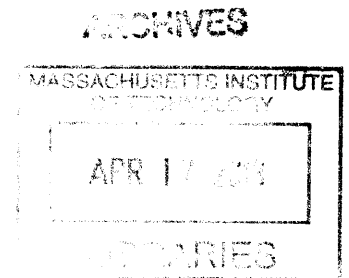
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***Army***

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## **ABSTRACT**

Charged by the Chairman of the Joints Chief of Staff, the authors were members of a study to develop innovative recommendations for transforming the military enterprise to better manage post-traumatic stress and related conditions in support of service members and their families. The authors first began their study by performing a stakeholder analysis to understand the unmet needs of stakeholders across the enterprise. By assessing stakeholder values across the life cycle, we found that there was a strong need to improve the continuity of care and accessibility of services for service members and their families, in particular for the Reserve Component and National Guard population.

Therefore, the authors investigated the role of technology to serve as a force extender to improve access and timeliness of care to psychological health care services. Specifically, they utilized a systems approach to evaluate the current state of telehealth within the Military Health System. By utilizing the enterprise lenses of strategy, policy, organization, services, processes, infrastructure, and knowledge to analyze the current state of telebehavioral health, they proposed a future state architecture for telehealth delivery. They highlight seven enterprise requirements for developing this future state architecture:

1. MEDCOM shall establish a core funding stream as a line item to support TH service line.
2. MEDCOM Telehealth Service line shall develop standard TBH metrics for deployment across the enterprise
3. MEDCOM Telehealth Service line shall identify eligible populations across the enterprise that could benefit from the expanded access that TBH services provide.
4. MEDCOM Telehealth Service line shall develop an enterprise solution that supports seamless flow of operational information and the electronic health record.
5. MEDCOM Telehealth Service line shall revisit specific policies that are presenting barriers to telehealth growth and sustainability.
6. MEDCOM Telehealth Service line shall encourage learning and best practice sharing across the Army TH enterprise.
7. MEDCOM Telehealth Service line shall collaborate with other Army governance organizations to develop a mobile health strategy and pilot projects for the Army enterprise.

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## ***Chapter 1: Introduction***

### ***Motivation***

#### ***Transformation is Needed in Healthcare***

According to the Center for Medicare and Medicaid (2009), health care expenditures now account for about 17.6% of the Gross Domestic Product due to excessive use of high cost care, missed opportunities for prevention, lack of opportunities for care coordination, inefficient care processes, and excessive administrative costs. Across 37 performance indicators, the United States achieved an overall score of 65 out of a possible 100 indicating a drastic need for quality of care improvement (The Commonwealth Fund, 2008). Finally, access to timely healthcare is a consistent issue with the total uninsured population in the United States rising to 47 million people (National Conference of State Legislatures, 2012). Collectively, these significant issues with respect to cost, quality, and access, highlight the need for a new care delivery model. In a recent article about chronic disease, the Robert Wood Foundation stated “overcoming these deficiencies will require nothing less than a transformation of health care, from a system that is essentially reactive - responding mainly when a person is sick - to one that is proactive and focused on keeping a person as healthy as possible” (Wagner et al, 1996). Today, seven out of ten Americans die each year from chronic disease and 78% of all healthcare costs can be traced back to about 20% of patients with chronic conditions (Kung HC, 2005). In 2005, a study by Wu et al found that 133M Americans (approximately 1 out of every 2 adults) had at least one chronic illness (Wu et al, 2000). Chronic disease requires a system’s perspective to examine the current system’s stakeholders, examine the process and actions surrounding chronic disease treatment, and a thorough understanding of the resources used to treat chronic diseases to understand how to architect a future system of care.

#### ***Specifically, Behavioral Health is a growing, chronic disease in the Military Health System***

Behavioral health (BH) conditions such as depression and post-traumatic stress disorder, can evolve into being chronic diseases, and are common in the United States and internationally. An estimated 26.2 percent of American adults, which equates to about one in four adults or 57.7M people, are faced with diagnosable mental disorders each year (Mental

Health Reporting, University of Washington). In addition, one in four families have at least one member with a psychological health disorder and many people experience co-morbidities (i.e. individuals are diagnosed with more than one disorder at a time). Specifically, 45 percent of individuals with a mental disorder also meet the criteria for at least 2 other disorders (Mental Health Reporting, University of Washington). Unlike other diseases, such as diabetes and heart disease, which can be diagnosed with a simple test, psychological health disorders are also often difficult to diagnose or classify. As stated by the Surgeon General of the United States, “the signs and symptoms [of mental disorders] exist on a continuum and there is no bright line separating health from illness, distress from disease. Moreover, the manifestations of mental disorders vary with age, gender, race, and culture.”

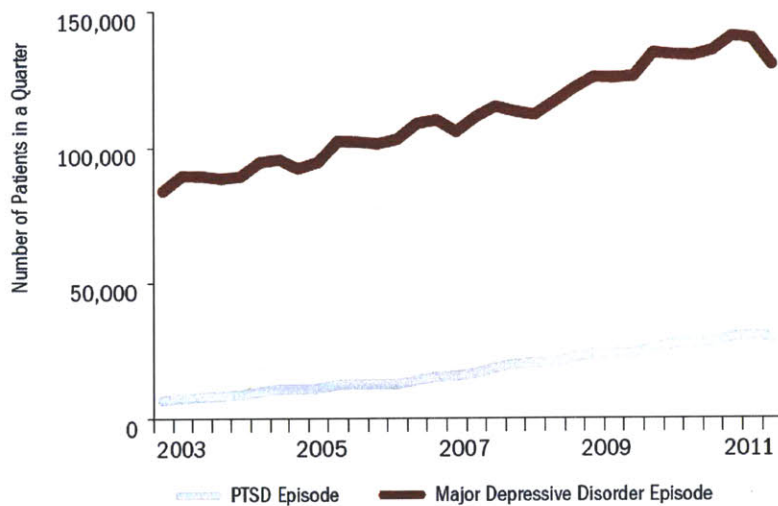
In particular, the military has a unique subset of behavioral health needs. Since October 2001, approximately 2 million U.S. troops have been deployed as part of Operation Enduring Freedom (OEF; Afghanistan) and Operation Iraqi Freedom (OIF; Iraq) with over 800,000 service member facing multiple deployments (Military Health System, 2012). The current pace of deployments in both OEF and OIF is unprecedented in the history of the all-volunteer force (Belasco & Bruner, 2007 & 2006). In addition, the length of the deployments in OEF and OIF has been longer, redeployments have been more frequent, and breaks between deployments have been shorter (Hosek et al, 2006). Developments in medical technology and body armor are allowing more service members to survive – the casualty rates of killed or wounded are lower than in previous wars, such as Vietnam and Korea (Regan, 2004; Warden, 2006). More service members are surviving war experiences that would have led to death in previous wars, resulting in the further emergence of “invisible wounds”, such as mental health conditions and cognitive disorders. The three major disorders of the wars cited in a 2008 Rand report are Post Traumatic Stress Disorder (PTSD; 5-15% prevalence), Major Depression Disorder (MDD; 2-14% prevalence), and Mild Traumatic Brain Injury (TBI; 2-6% prevalence) (Tanelian and Jaycox, 2008).

To help combat the rising stress levels in the Military, the Military Health System (MHS) provides psychological health services for service members and their families as part of the larger health care delivery system that is managed through TRICARE. TRICARE is currently the

health care program serving Uniformed Service members, retirees and their families worldwide. The care stateside is provided by Military Treatment Facilities (MTFs) and further augmented with purchased care from civilian providers. In-Theatre care is provided by the medical commands in treatment facilities in forward operating bases. To date, over \$2 billion has been invested in providing psychological health services, and the FY 2010 budget allocation for psychological health totaled \$715 million with over 125 psychological health programs distributed throughout the military. This action was triggered by the DoD Task Force on Mental Health report, which noted that the current system of care was insufficient to meet the current and future needs of service members and their beneficiaries (DoD Task Force on Mental Health, 2007). Despite this large allocation of resources and seemingly extensive support network, there are still several challenges currently facing the MHS enterprise. Principal among them is the system of care utilized to provide psychological health services to service members and their dependents. The MHS faces 4 key challenges in delivering care to those requiring these services, which include (1) growing demand for psychological health services, (2) ensuring access to care, (3) maintaining a healthy population, and (4) combating culture and stigma associated with psychological health disorders.

Since the beginning of OEF and OIF almost a decade ago, the demand for psychological health services has consistently increased. Based on the ICD-9 codes of 2011 Defense Medical Surveillance System data, 8.2% of armed forces are faced with mental health conditions (Military Health System Stakeholder Report, 2012). Also close to 18,000 service members who deployed in OEF/OIF are diagnosed with PTSD (compared to only 2000 SM who did not deploy). In 2009, the number of hospitalizations for active duty service members for psychological health disorders exceeded the number of injuries or pregnancies (about 15,000 hospitalizations). Also it was found that 40% of combat veterans suffer from psychological and neurological illnesses (National Council on Disability, 2008). Figure 1 below highlights the MHS prevalence of diagnosed depression and PTSD in adult beneficiaries (Department of Defense MHS Stakeholder Report, 2012). The report specifically states “the MHS has had to adapt to a rise in depression and other mental illness that may be related to the effects of ten years of war...Over the past six years the diagnosis of depression and PTSD has increased by nearly 100%

in the total MHS beneficiary population.” In addition, family members of service members often face “secondary traumatization”, which is “the trauma experienced by one partner that is transmitted to the other through knowledge of the trauma and care for, emphasizing with, a traumatized partner” (Figley et al, 1993). As stated by Hendrix et al and Salvatore et al, “unfortunately the effects upon family members and family relationships appear mostly negative...PTSD symptoms have been found to negatively impact relationships with spouses and family members” (Hendrix, 1995; Salvatore, 1995) Therefore, there is a growing need for the MHS enterprise to provide care to both service members and their families.

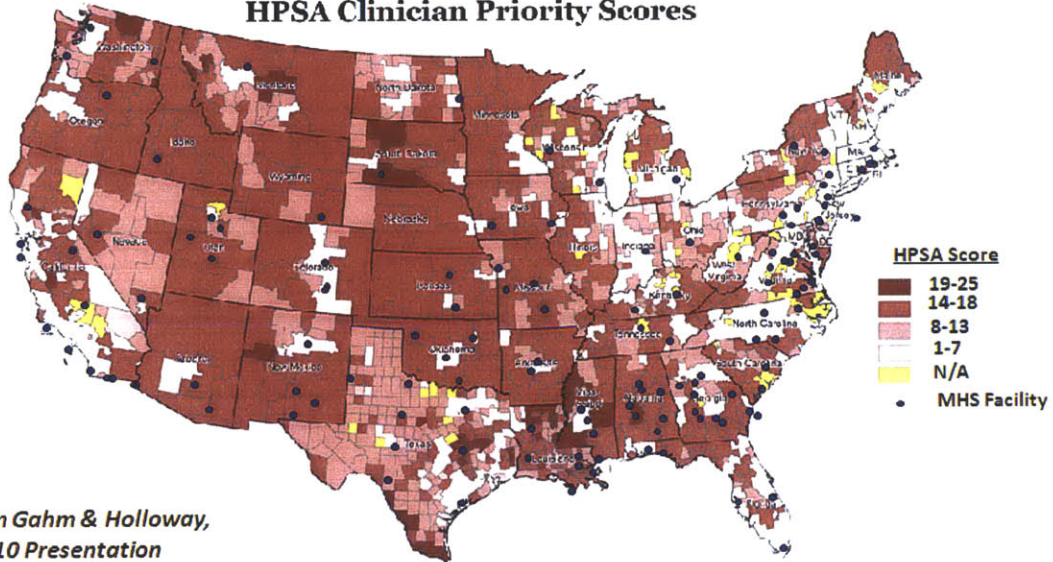


**Figure 1: MHS Prevalence of Diagnosed Depression and PTSD in Adult Beneficiaries**  
 (Source: Department of Defense MHS Stakeholder Report, 2012)

Secondly, service members and their families have difficulty accessing care provided by the Military Health System stateside in a timely manner. Currently, 50 million American live in rural areas (Wood, 2010) and “though only 19% of the nation lives in rural America, 44% of U.S. Military recruits come from rural areas” (Heady, 2009). These rural areas are often not co-located with the psychological health services and have limited accessibility to Military Treatment Facilities (MTFs), which is highlighted in Figure 2 below. Distance from facilities that deliver mental health services plays an important role in service member access to care. One study found that a shorter distance from the nearest outpatient VA clinical was associated with better access, timeliness, and intensity of medical services used. (Druss et al, 1997). A recent Roundtable discussion by the Altarum Institute in December 2010 found that “the time and distance involved in receiving treatment can severely affect their lives, disrupting families and

making steady employment difficult if not impossible.” A study by Spont in 2010 found that veterans diagnosed with PTSD were less likely to access specialty PTSD clinics, which were mainly located in urban areas. (Spont et al, 2010). In addition, it is also critical for service members to receive treatment in a timely manner. A 2009 study by the National Council on Disability states that “in terms of screening, evidence suggests that identifying PTSD and TBI early and quickly referring people to treatment can shorten their suffering and lessen the severity of their functional impairment.” However, due to distance, service members find it difficult to access care urgently, especially during an acute stress reaction.”

**Health Professional Shortage Areas (IIPSA) - Mental Health  
HPSA Clinician Priority Scores**



*Adapted from Gahm & Holloway,  
MHS 2010 Presentation*

**Figure 2: Health Professional Shortage Areas in the United States.**  
(Source: Gahm & Holloway, MHS 2010 Presentation)

In particular, the Reserve Component (RC) and National Guard (NG) are often neglected within the psychological health system of care due to accessibility issues. Figley et al states that “little is understood with regard to the activation and deployment of national guard and reserve units personnel and their families and the psychological impact on the spouse and marriages associated with war deployment” (Figley et al, 1993). In a 2007 study of Army families (“What We Know”), they found that a year-round family support infrastructure tended to be lacking in RC units. They highlighted that only about half of spouses of Army Reserve NG Soldiers and USAR Soldiers (54% and 52%, respectively) reported that their Soldier’s unit had a

Family Resource Group, compared with 88% of Active component spouses. In addition, during one of our site visits, a provider stated “Guard and reserves can only receive care during activation and 180 day following deployment...the problem is that they are on the outside.” This “neglect” for the RC and NG service members and their families can be linked to the lack of services available to those not living on the base. In the “The Sanctuary for Veterans and Families”, they mention that “the military offers social services and family counseling for husbands, wives, and children of servicemen and women deployed overseas. However the services are only available to those who live on base. As a result, [many] have almost nowhere to turn for support.” Although supportive and preventative services are available for families of NG and RC service members while they are deployed (40% of OEF and OIF service members are from the RC or NG), they tend to be unaware that they have access to these services because they are not on-base.

Thirdly, the MHS seeks to maintain and sustain a resilient military population. Behavioral health care treatment acts as both a force preservation mechanism and a model for ensuring a healthy population in the future. However, it was found that 30% of mental health problems occur within 3-6 months after return/release from service and this number increases with time (Hoge et al, 2006). In addition, the MHS recently reported that 30-40% of cases become chronic and 33% of service members diagnosed with PTSD separate within 1 year, which highlights that psychological health disorders not only impact the MHS, but also the Veteran’s Health Administration. This is also further highlighted in the MHS 2012 Stakeholder report, which states “the unprecedented length of two wears has tested our resilience in providing operational medical support and caring for returning wounded warriors with complex, long-term health care needs” (Department of Defense MHS Stakeholder Report, 2011).

In addition, there is little understanding surrounding the mechanism causing and perpetuating the disease itself. Recently, General Chiarelli, Vice Chief of Staff of the U.S. Army, stated that “we just don’t know that much about the brain” at the 2011 Military Health System Conference. Because PTSD is a complex, chronic disease often associated with other co-morbidities (such as depression or TBI), it makes it a very complicated disease to both diagnose and treat. The National Institute of Mental Health describes two primary treatments for mental

health disorders today, which include psychotherapy, pharmacotherapy, or some combination of the two. Psychotherapy primarily consists of speaking with a mental health professional either one-on-one or in a group setting, while pharmacotherapy with medications, in particular the anti-depressants Zoloft and Paxil, are utilized to help patients control PTSD symptoms. Although there have been recent developments in several therapies, the effectiveness of most PTSD therapies is unclear. A committee composed of members representing the US Department of Veterans Affairs (VA), Congress, and the research community concluded that the “effectiveness of most PTSD therapies is uncertain; research is urgently needed to determine which therapies work” (Committee on Treatment of PTSD, 2007). A study recently completed by Bradley et al found that the therapies tested resulted in improvements for 67% of patients with PTSD who no longer meet criteria for PTSD. (Bradley et al, 2005). However, they stated that “the majority of patients post treatment continued to have substantial residual symptoms, and follow-up data beyond very brief intervals have been largely absent.” In addition, there is no “one size fits all” treatment for the disorder and there is a strong need to coordinate with several providers of care, such as mental health specialists, primary care physicians, and social workers, to provide treatment.

Lastly, service members are often reluctant to seek care due to the stigma associated with receiving treatment associated with mental health disorders (Olden et al, 2010). A recent presentation by the Military Health System highlighted that 40% of service members have concerns about stigma (Military Health System, 2012). The Department of Defense Task Force on Mental Health (2007) identified the stigma of mental illness as a significant issue preventing service members from seeking help for mental health problems. They found that service members were often paying for treatment out-of-pocket at civilian providers to avoid documentation of receiving treatment for a mental health disorder. Military culture itself is often associated with not receiving care. The military often promotes “inner strength” and resiliency to deal with psychological issues and seeking treatment may be perceived as weakness (Langston, 2007). Younger service members are less likely to receive treatment because they feel uncomfortable at VA facilities which are often associated with older and chronically ill patients (Burnam, 2008). Family members are often the first line of defence. In

one of our site visit, a service member stated “What did it take to get me to get care? My wife. It took my wife to help me realize.” Finally, service members are often skeptical about the benefits of treatment.

### ***Use of Telehealth to Meet Behavioral Health Needs in the MHS Enterprise***

Due to this interesting phenomena taking place in the military population with behavioral health, we need to apply a system’s view to architect a new robust care delivery model in an evolving enterprise faced with the four main challenges described above. In this new care delivery model, it is important to examine how we can design a system in light of increased demand as highlighted in Figure 1. The MHS Stakeholder report states “we continue to face a growing demand for services and a recognition that service members will be contending with the psychological consequences of wars for years to come” (Department of Defense MHS Stakeholder Reports, 2012). Although one of the easier responses would be to hire and train more providers, there is more that can be done in the form of system management to better meet the demand of services with limited resources. In addition, intervention early and appropriately can potentially help prevent chronicity of psychological health conditions in the military. As stated in a recent presentation by William Kassler, the Chief Medical Officer of the New England Region of Center for Medicare and Medicaid services, “care redesign will require a decrease in resource consumption, eliminating redundant steps/streamlining care processes, and a prioritization of care coordination” (David Kessler, 2012). The new model of delivery could utilize technology as a force extender to utilize the existing provider resources and “multiply” them for more effective and efficient care delivery. In particular, telehealth has evolved in the current Army system since 1992 and is often utilized as a force extender to perform screenings of service members returning home from OIF and OEF. Telehealth has several definitions:

- “The practice of medicine without the usual physician-patient confrontation...via an interactive audio-video communications system.” (Bird, 1971)
- “Originally known as telemedicine, but later broadened to telehealth, is a subset of e-health, which encompasses all uses of ICT in health, including electronic records and



decision support systems. Telehealth is particularly characterized by the geographical separation of patient and provider.” (Bashur, 2000)

- “Any communication modality that allows physical separation of patient and practitioner” (Darkin & Cary, 2000).
- “Delivery of health care services at a distance using information and communication technology (ICT)” (Wade, 2010)

Specifically, the American Telemedicine Association, the main trade association supporting advanced remote medical technologies, defines telehealth as the “delivery of any healthcare service or transmission of wellness information using telecommunications technology.” Telehealth has several diverse modalities, which include videoconferencing, mobile health, transmission of still images, e-health including patient portal, virtual reality, remote monitoring of vital signs, and collaborative care (Wade, 2010). Telehealth can be delivered synchronously (i.e. in real-time where the providers and patients interact with each other simultaneously) and asynchronous.

The MHS is well-positioned to develop telehealth capabilities for the psychological health system of care due to strong motivation to meet increasing demand of service, an enterprise-wide information technology (AHLTA) system in place, appropriate staffing resources to deliver care remotely, a mandate to cut costs due to looming budget reductions, a hierarchal structure to mandate shifts in care delivery, and a culture to drive change. Specifically, service members returning home from deployments in Iraq and Afghanistan are faced frequently with complex, psychological health disorders and are often not located near Military Treatment Facilities. In addition, 3000-5000 service members often return to their home military installations simultaneously and are required by the MHS to complete a series of screenings, which overwhelms the providers at each of these locations. Telehealth attempts to tackle the uncertainty surrounding this problem of geographic dispersion and wave surges by helping to provide more accessible healthcare delivery. In addition, it offers one solution to help better match the supply of providers and demand of service members within the MHS enterprise. However, current regulations mandate that the delivery of any treatment take place in the clinical setting. Although this allows service members to receive treatment in satellite locations

closer to their home, they still cannot receive it in the privacy of their own homes, thereby limiting the full value proposition of telehealth. A systems approach is needed to understand the multiple layers and dimensions of telehealth, which extends to understanding the system's stakeholders (patients, providers, families, leadership), relevant policy (accounting for services, patient privacy, and provider licensing & credentialing requirements), and the technology and infrastructure surrounding telehealth treatment.

### ***Research Questions and Framework***

Therefore, the purpose of this thesis is to utilize a system approach to evaluate the current state of telehealth within the MHS enterprise. Based on this evaluation, I will propose an architecture of a future system of telehealth delivery in the MHS context.

Specifically, my research questions are:

- What are the underlying factors that are both hindering and driving telehealth in the MHS context?
- What analytical lenses can we use to study the role of technology in the healthcare context?
- Given underlying factors and findings from analysis utilizing lenses, what are the potential future telehealth architectures?

### ***Research Contributions***

Specifically, this work has several contributions to both the DoD and the larger healthcare context in the United States. It will present a clear mapping of the current state and examine the role of technology augmenting and supporting healthcare delivery with regard to psychological health disorders, which can be applied to other chronic diseases, such as diabetes, chronic pain, or heart disease. Along with technology needed to provide treatments remotely, telehealth also requires several other layers, which will be described further in chapter 2, including an effective strategy, policy, organization and human capital, processes, services, infrastructure, and knowledge sharing across the enterprise. By architecting a telehealth system of care that involves all of these lenses, these can potentially help serve as a model for telehealth architectures in care delivery systems outside of the MHS context. For

example, the VA presented their five strategies to enhance PTSD treatment at a recent Military Health System conference. Specifically, they stated evidence-based telehealth and mobile health apps are one of their primary strategies for the VA. Therefore, this work could have further implications in modeling and developing telehealth systems in the VA. Telehealth will also have a critical role in the evolution of the US Health Care System. As shown in Figure 3 below, it will be an important component of “Community Integrated Healthcare 3.0” model in the Health Delivery System Transformation Critical Path Plan, which was presented also by William Kassler as part of the strategic vision for healthcare in the United States in coming years. There is a large opportunity for telehealth to also expand specialist care into underserved rural areas. Using our proposed model, states and hospitals could redesign their care pathway. Finally, the military has set the standards with other innovations, such as the internet and GPS. Why can’t it do the same with healthcare?

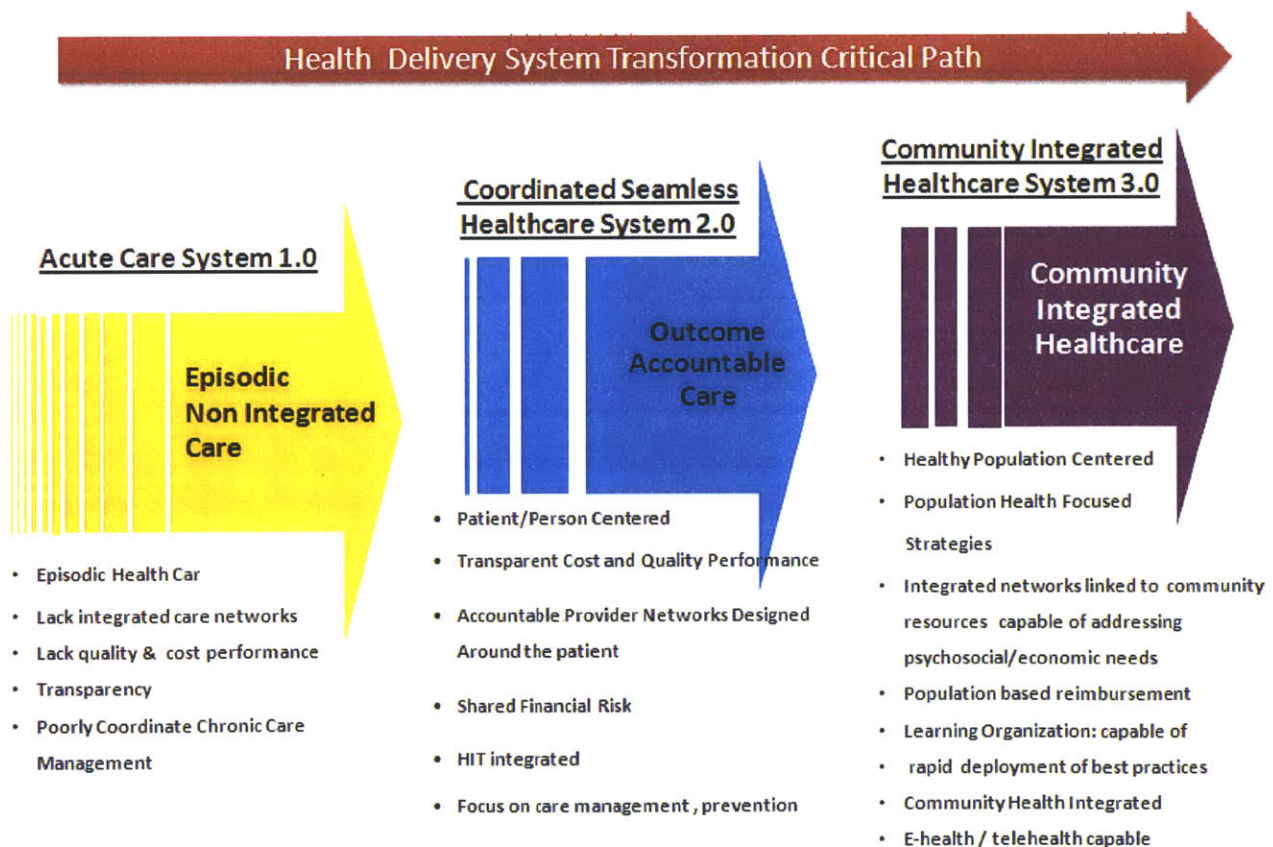


Figure 3: US Health Care Delivery System Evolution (Source: William Kassler, Chief Medical Officer of the New England Region of Center for Medicare and Medicaid Services)

## ***Chapter 2: Stakeholder Values in Behavioral Health System of Care***

### ***Introduction: Stakeholder Background***

To effectively evaluate the current state of telebehavioral health delivery in the MHS, we want to first take a closer look at the larger enterprise stakeholders and their specific values across the psychological health system of care in the Military Health System. Stakeholders are defined as “any group or individual that can affect or that is affected by the achievement of the enterprise’s objectives” (Freeman, 1984). Specifically, value is defined as “how various stakeholders find particular worth, utility, benefit, or reward in exchange for their respective contributions to the enterprise” (Murman et al 2002). The notion that actively managing stakeholders was an integral part of successfully managing an organization was first introduced by Freeman, who stated that “the stakeholder approach is about groups or individuals who can affect the organization, and is about managerial behavior taken in response to those groups or individuals” (Freeman, 1984). Stakeholder analysis provides us with an opportunity to assess the value exchange between stakeholder groups and align the enterprise with its stakeholders (Freeman, 1984). To transition Freeman’s definition to reflect a more systemic or lean definition (which is the foundation of enterprise transformations) Nightingale and Srinivasan states “stakeholder are any group or individual who directly or indirectly affects or is affected by the level of achievement of an enterprise’s value creation processes.” Therefore, Nightingale and Srinivasan state “a basic approach for successful transformation is having an understanding of the enterprise value proposition and ensuring that the constructed value proposition is a true reflection of the values of its stakeholders. The stakeholder analysis – that is, identifying and prioritizing stakeholders as well as eliciting and interpreting stakeholder values – is neither linear nor simple, but it is essential” (Nightingale and Srinivasan, 2011). Specifically, they highlight the process for identifying stakeholder values in Figure 4 below.

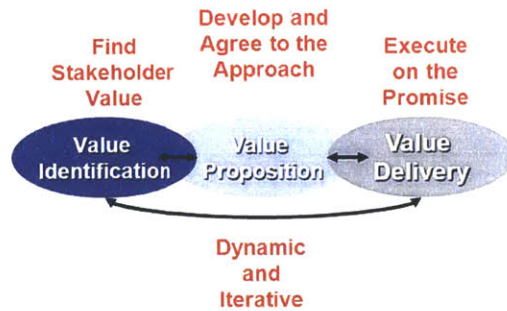


Figure 4: Identifying Stakeholder Values  
 (Source: Integrating the Lean Enterprise lecture, Deborah Nightingale)

This concept is a central tenet in enterprise transformation and it is important to understand not only the enterprise stakeholders and their values, but also where are involved and their importance in particular enterprise processes. Grossi states “The complexity of the organizational relationships among different stakeholders and its consequences on the value creation processes represents both, a threat to the enterprise lean transformation, and a source of opportunities to successfully push the enterprise forward into the future.” Therefore, the next section identifies stakeholders and their values in the Military Health System to help us re-design and transform the TBH system of care.

### ***Military Health System Stakeholders***

### ***Literature Analysis of Enterprise Stakeholders and their Values***

In our first iteration of stakeholder analysis, we wanted to understand stakeholders needs and values throughout across the three stages of the military service life cycle of pre-deployment, deployment, and reintegration. Understanding how these values change over these three stages using the published literature serves as a first step to establishing the requirements to architect the future system of care. The first round of analysis of the stakeholders and their values was drawn from eighty papers in the literature (Ippolito and Srinivasan, 2011). Figure 5 below shows the initial depiction of the behavioral health enterprise stakeholders through a waterdrop model. Grossi (2003) describes a waterdrop model as “ a way of depicting different type of relationships among stakeholders and a focal firm in an enterprise...highly collaborative relationships are depicted as overlapping ‘drops’ (ellipses) that mean to indicate that the relationship is very cooperative in nature and based on trust between

the parties. The overlapping degree intends to represent the level of cooperation and collaboration between the parties.” There are two large clusters in Figure 5: one is revolving around the MHS leadership/organization, while the second is revolving around the execution of care surrounding the warrior.

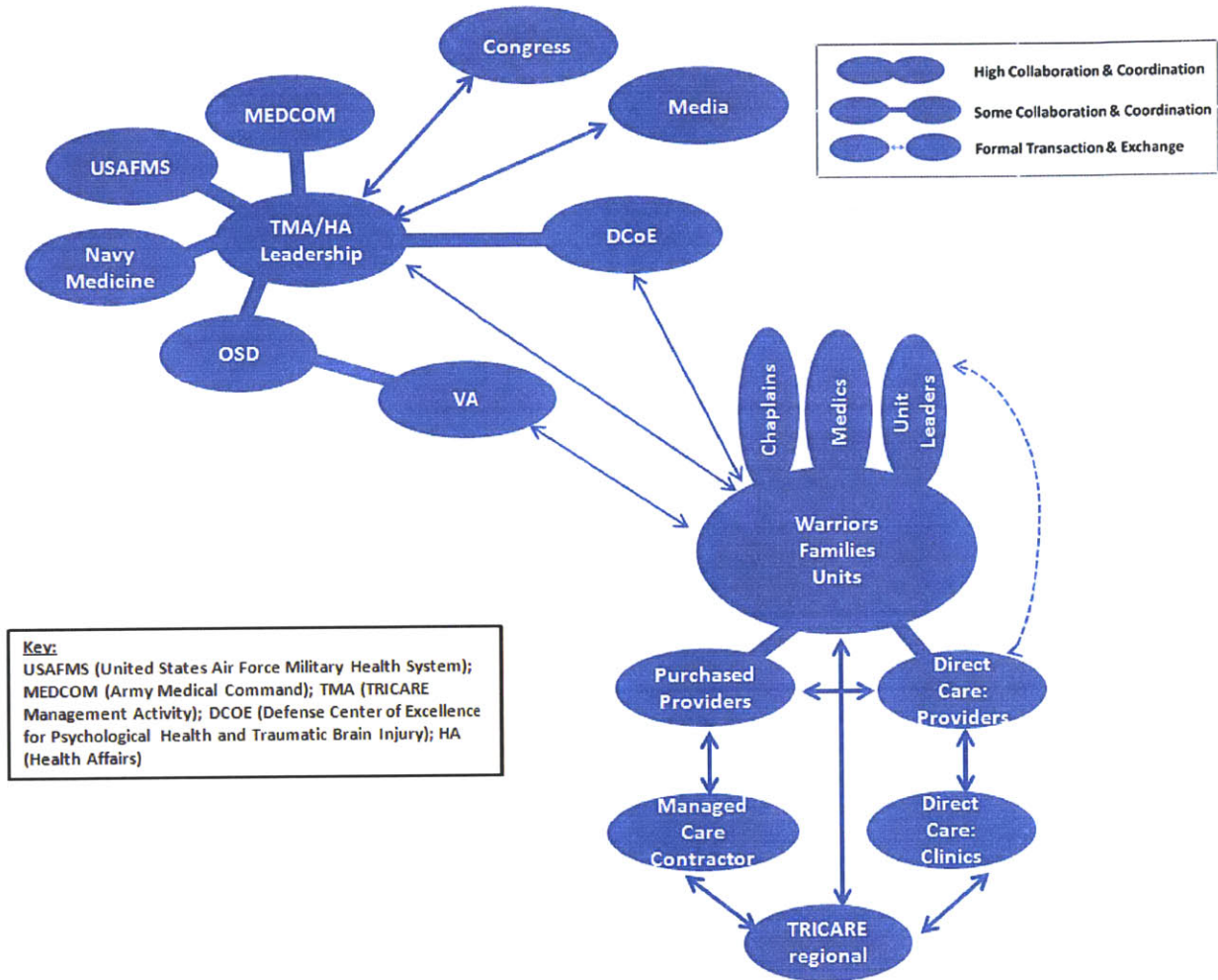


Figure 5: Stakeholder Waterdrop Model of Military Health System

It is important to point out that while the actual provision of care happens at the execution layer, the policies, guidance and resources are provided by the leadership stakeholders highlighted in Figure 5 above. Overall, there is a disconnect between the leadership within the MHS enterprise and the stakeholders at the execution level of care (shown in Figure 5). We conducted an analysis of the past ten years of stakeholder reports generated by the MHS (U.S. Department of Defense, 2012). We choose to primarily focus on these reports because they were the most consistent documentation from the past decade

recording MHS leader's values, goals and objectives over time. Ideally, a stakeholder report chronicles information and value statements of the various stakeholder groups to give the reader a "pulse" on the current state of the key actors within an enterprise. In general, many of these reports fell short in describing all of the stakeholders within the MHS, often times focused only on the opinions of the leaders and metrics surrounding the TRICARE health plan. In addition, several other gaps exist across the report, including the lack of a report in 2009 and the missing perspectives of the Surgeon Generals of the Army, Navy, and Air Force from 2001 to 2003. Also the reports highlight the frequency of leadership changes across the MHS organization. Since 2001, six individuals have held the title of ASD(HA) with four individuals holding the title in the last 3 years alone. The Surgeon Generals appeared to have turned over every 2-3 years within each of the services.

To properly identify MHS leadership values, we first looked at the frequency of psychological health references in each of the MHS leaders' statements from the stakeholder reports from 2001 - 2010 (see Table 1 below). We examined the number of "meaningful references" of psychological health by the MHS leaders. (To calculate this, we looked at the specific context of the reference and not just word counts). Historically, psychological health was rarely documented by military leaders. In addition, by looking at these references, we were able to identify several discrepancies between the messages related to psychological health provided by the ASD(HA) and surgeon generals across the report. For instance, the ASD(HA) placed a heavy emphasis on the importance of addressing mental health disorders in the military in 2007, but not one of the SG of the services made any reference to it. In contrast, the Surgeon Generals of the Army, Air Force, and Navy described the importance of providing care for those suffering from mental health disorders in 2010, but the ASD(HA) failed to mention this issue in their statement. Earlier, we described gaps between the development vs. execution of policy within MHS, while this examination of psych health references highlights the disconnect between communications directly within the leadership of the MHS Enterprise.

After identifying the references to psychological health in the Stakeholder Reports, we teased out the specific values of each of the MHS leaders. As shown in Tables 1, we have listed out the number of values described by each MHS leader and the number of values related to

mental health. Up until 2007, we found limited data where leaders discussed psychological health as a priority despite the growing numbers of servicemembers returning home from OEF and OIF with mental health needs. Psychological health was not even mentioned in the body of any of the stakeholder reports until 2006. In this 2006 report, one of the sections described the current state, implications, and programs available to support treatment of combat stress in extensive detail. However, none of the MHS leaders even mentioned psychological health in their statements. As discussed in the previous section, this “two phase” approach of organizing MHS, which separates the policy-makers vs. the policy-implementers, often leads to a disconnect between what leaders’ value and what is actually taking place across the organization. The value statements of the leaders should reflect the key strategic execution areas of MHS.

**Table 1: MHS Leadership Value Count** (Source: MHS Stakeholder Reports from 2001-2010)

VC	2001	2002	2003	2004	2005	2006	2007	2008	2010
ASD(HA)	9	13	16	8	16	16	15	8	5
<b>Total</b>									
ASD(HA)	0	0	0	0	0	0	3	1	0
PH									
SG(Army)				2	2	6	4	9	14
<b>Total</b>									
SG(Army)				0	0	0	0	1	3
PH									
SG(Navy)				3	4	11	5	11	9
<b>Total</b>									
SG(Navy)				0	0	0	0	1	0
PH									



<b>SG(Air Force)</b>			11	8	9	10	9	7
<b>Total</b>								
<b>SG(Air Force)</b>			0	0	0	0	0	1
<b>PH</b>								

VC: Count of Values Espoused by Senior Leadership

PH: Count of Values Related to Psychological Health

We took a closer look at the values presented by each of the MHS leaders and we found some common trends across the leadership statements. These trends are summarized in Figure 6 below. From 2002-2007, Dr. William Winkenwerder held the position of ASD(HA). Earlier in his term, most of his values were surrounding the management of TRICARE and disseminating medical entitlements to the appropriate beneficiaries. In 2005, there was a shift: most of his value statements seemed to revolve around providing care and service to promote healthy lifestyles. These values were also reflected in several of the leader’s values. For instance, the Surgeon Generals of the Army, Navy, and Air Force all spoke extensively about the importance of fostering healthy lifestyles for both servicemembers and their families. In this same year, the report actually discussed the importance of the various the stakeholders within the MHS organization. For instance, the last page of the report states “ What We Value and Why It Matters: When employees are valued, they find satisfaction within their jobs and deliver better customer service resulting in happier beneficiaries. Appreciated employees have a positive impact on the success of an organization. Within the Military Health System, we place a high value on our personnel. This value has a direct effect on how we deliver the TRICARE health benefit.” This was one of the first times that the different stakeholders within the MHS organization were taken into consideration. In this same year, each of the leader’s values statements also seemed focused on the entire system by describing values surrounding transformation across the MHS, VA-DOD collaborations, and the delivery of care to promote healthy lifestyles. In the following years, many of the leaders’ values also reflected this change

in approach: they then began to look at treating the “whole patient,” which included identifying psychological health as a priority in 2007.

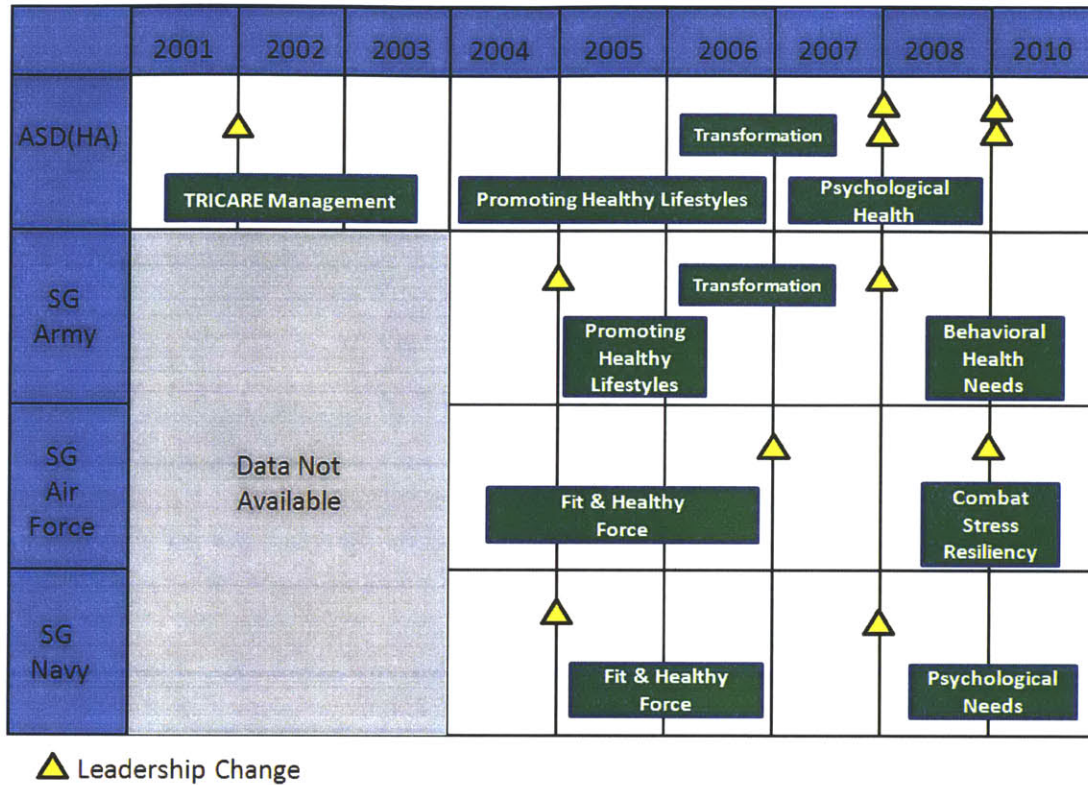


Figure 6: Trends Surrounding Leadership Values  
 (Source: MHS Stakeholder Reports, 2001-2012)

After completing this analysis, we then focused our literature analysis on understanding the needs and values of the stakeholders in the bottom cluster of Figure 5. These stakeholders highlighted in this cluster represent the larger system of care as seen from the outside through literature analysis and review of the MHS stakeholder reports from 2001 – 2012. In general, the values for warriors/service members, families, providers, and unit leaders were of particular interest to us because they represented a large portion of the MHS behavioral health population. Specifically, we espoused stakeholder values from literature and classified each need or value for each stakeholder according to three categories: green (system currently meets stakeholder needs), yellow (system somewhat addresses stakeholder needs), and red (current system does not address stakeholder needs) in Figures 7-9 below. Based on this

analysis, we realized that stakeholder values evolve and vary depending on the stage of the military life cycle: pre-deployment, deployment, and reintegration.

During the pre-deployment stage, Figure 7 highlights that access to and timely care is particularly difficult for the Reserve Component and National Guard. Figley et al states “little is understood with regard to the activation and deployment of National Guard and Reserve Unit personnel and their families and the psychological impact on the spouse and marriages associated with war deployment” (Figley, 1993). In addition, the report by Bradford et al stated “Although preventative services are available for families of NG and RC service members while they are deployed (40% of OEF and OIF service members are from the RC or NG), they tend to be unaware that they have access to these services because they are not on-base.”

		Pre-Deployment								
Stakeholders	Values	Access to Care	Timely Care	Service Member Readiness	Prevention of PTSD and its associated disorders	Coordinated Care	Reasonable Cost of Care	Effective Training	Fostering Community Support	Availability of Peer Support
	Active Duty SM		Yellow	Yellow	Green	Red	Yellow	Green	Yellow	Red
RC/NG SM		Red	Red	Yellow	Red	Red	Red	Yellow	Red	Yellow
Families		Yellow	Yellow	White	Red	White	Yellow	White	Red	Yellow
MHS Leadership		White	White	White	White	White	Yellow	White	White	White
Providers		White	White	Yellow	Yellow	Yellow	White	White	White	White
Unit Leadership		White	White	White	White	White	White	Yellow	White	Green

Figure 7: Pre-deployment Stakeholder Needs and Values

During the Deployment stage shown in Figure 8, maintaining family relationships becomes difficult. In a 2003 study on military community integration, for example, only about half of spouses of ARNG Soldiers and USAR Soldiers (54% and 52%, respectively) reported that their Soldier’s unit had a Family Resource Group compared with well over three-fourths (88%) of AC spouses. Also only forty percent of ARNG spouses were satisfied or very satisfied with the support receive from their Soldier’s unit. The Bradford report also found that any employed Army NG spouses with children have reported difficulty both working full time and providing care for children as a single parent while their spouse is deployed. In some cases, child care demands forced spouses to quit their jobs or reduce their hours. In addition, family members of the RC and NG often are disconnected from the system because they encounter several barriers

to obtaining healthcare services through the TRICARE system while their service member is deployed. When their RC service member is activated, many family members transition between civilian health insurance to TRICARE, and then are forced to transition back after their service member returns home from deployment. For example, a study completed by Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs in 2003 found that roughly one-half of families of ARNG and USAR Soldiers activated in 2002 (56% and 49%, respectively) relied exclusively on TRICARE for their health coverage during the activation. They stated that the transition to and from TRICARE can be “time consuming, confusing, and logistically challenging.” Many spouses often face this transition alone and find it difficult to find civilian providers that will participate in the TRICARE plan. Even once they identify civilian providers that accept TRICARE, the providers do not communicate with the MHS enterprise, which further emphasizes how these families can get “lost” within the continuum of care (if they even receive psychological services at all) and not receive adequate support.

		Deployment									
Stakeholders	Values	Access to Care	Timely Care	Reducing Stigma	Maintaining Family Relationships	Effective Psychological Health Programs & Services	Mitigating Symptoms of PTSD & its associated disorders	Reasonable Cost of Care	Availability of Peer Support	Coordinated Care	Fostering Community Support
	Active Duty SM										
RC/NG SM											
Families											
MHS Leadership											
Providers											
Unit Leadership											

Figure 8: Deployment Stakeholder Needs and Values

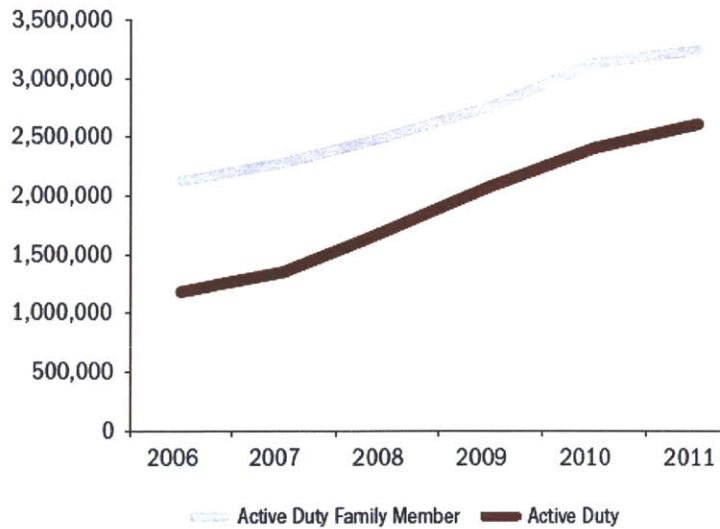
Finally, Figure 9 highlights the reintegration stage, where service members face the most dramatic needs as they attempt to return to normal life in garrison. In particular, the reintegration stage is dominated by several unmet stakeholder needs with regard to access to and timeliness of care, stigma, maintaining family relationships, and mitigating PTSD symptoms. The largest disconnect between AC and the RC/NG took place during the reintegration stage, which is primarily because MHS no longer provides services to the RC/NG and their families at this stage. In general, Markowitz found that a “lack of social support was the single largest predictor of developing PTSD after a traumatic event. Life stress and trauma severity were the

next largest predictors. Lack of social support is a major risk factor for developing PTSD” (Markowitz et al, 2009). In addition, while most AC Soldiers continue to work in the military post deployment, most RC service members are deactivated and are expected to return to their civilian jobs. The transition can place significant stress on the returning service members and therefore impact the family.

		Reintegration										
Stakeholders	Values	Access to Care	Timely Care	Reducing Stigma	Maintaining Family Relationship	Effective Psychological Health Programs & Services	Fostering Community Support	Reasonable Cost of Care	Career Opportunities	Peer Support	Coordinated Care	Mitigating Symptoms of PTSD & its associated disorders
	Active Duty SM		Yellow	Yellow	Red	Red	Yellow	Yellow	Yellow	Green	White	Yellow
RC/NG SM		Red	Red	Red	Red	Yellow	Red	Red	Red	White	Red	Red
Families		Red	Red	Red	Red	Yellow	Red	Yellow	Red	White	Red	Red
MHS Leadership		White	Yellow	Yellow	White	Yellow	White	Yellow	White	White	White	Yellow
Providers		Red	Red	Red	White	Yellow	White	Yellow	White	White	Yellow	Yellow
Unit Leadership		White	White	White	White	White	White	White	White	White	White	White

Figure 9: Reintegration Stakeholder Needs and Values

We also wanted to take a closer look at one of the stakeholder groups, families, because their needs were consistently not met throughout this analysis. Figure 10 below shows the growth of behavioral health needs for families (Department of Defense MHS Stakeholder Report, 2012). The report also states “the cumulative effects of ten years of war, as well as successful anti-stigma campaigns have driven demand for behavioral health services to new highs for active duty service members and their families.”



**Figure 10: Behavioral Health Outpatient Encounters**  
 (Source: Department of Defense MHS Stakeholder Report, 2012)

Families represent a significant portion of the patients within the MHS – family members actually outnumber service members themselves (see Table 2). For instance, 53% of deployed service members are married and 68% have kids.

**Table 2: Percentage of Family Members and Service Members in the Active & Reserve Components.**  
 (Source: FY 2005 Active Duty Family/Sponsors and Eligible Dependent Report, Defense Manpower Data Center (DMDC); FY 2005 Selected Revenue Dependents Report, DMDC)

	<i>Active Component</i>	<i>Reserve Component</i>
<i>Family Members</i>	59%	58%
<i>Service Members</i>	41%	42%

As stated in the 2007 study “What We Know about Army Families”,

*“Military forces do not exist in a vacuum but rather are embedded in a larger host society...families are now routinely being asked to endure a greater level of sacrifice than was true during the years immediately following the end of the Cold War, reliable research-based information is required to inform decisions about the resources, policies, and systems that must be in place to help Soldiers and their families achieve balance in the face of increased demands. Army family well-being cannot be sustained under the stress of frequent and prolonged operational deployments without effective support.”*

In addition, family members are often the first line of “defense” for the MHS enterprise because they are providing day-to-day care for returning service members. Often times, the

values of family members are often left out of the discussion, which can further impact the ability for service members to recover from PTSD. For instance, Beckham et al. state that, “caregiver burden had a direct correlation with veteran PTSD symptom severity and explained a significant proportion of the variance in the partners’ adjustment (i.e. psychological distress, dysphoria, anxiety).” Therefore, it is legitimate to include families within the psychological health services system of care. Families also possess the key attribute of urgency because it is critical to provide care to those affected by PTSD and their families in a timely manner because it best helps prevent the emergence of chronic stressors. A 2009 study by the National Council on Disability states that, “in terms of screening, evidence suggests that identifying PTSD and TBI early and quickly referring people to treatment can shorten their suffering and lessen the severity of their functional impairment.” Because many family members suffer from secondary traumatization, it is imperative to provide care before and after the service member returns home from deployment to best treat and prevent any chronic psychological impairments.

To evaluate the values of families with regard to psychological health services in the MHS enterprise, we performed a review of the literature and MHS documentation and drew out the current “stressors” facing military families. In addition to the 3 stages discussed above, we also found that relocation was another significant step in the military life cycle with regard to families. Therefore, we included this stage in our analysis for families. From there, we characterized each stressor (or value) according to three criteria, which included (1) amount of documentation related to specific stressor, (2) current services provided by MHS to address this stressor, (3) the extent of the military population affected by this stressor. Based on this classification, we created three categories: green (system currently meets families’ needs), yellow (system somewhat addresses families’ needs), and red (current system does not address families’ needs), which are depicted below in Figure 11. Specifically, we will describe the “red” stressors identified below in further detail.

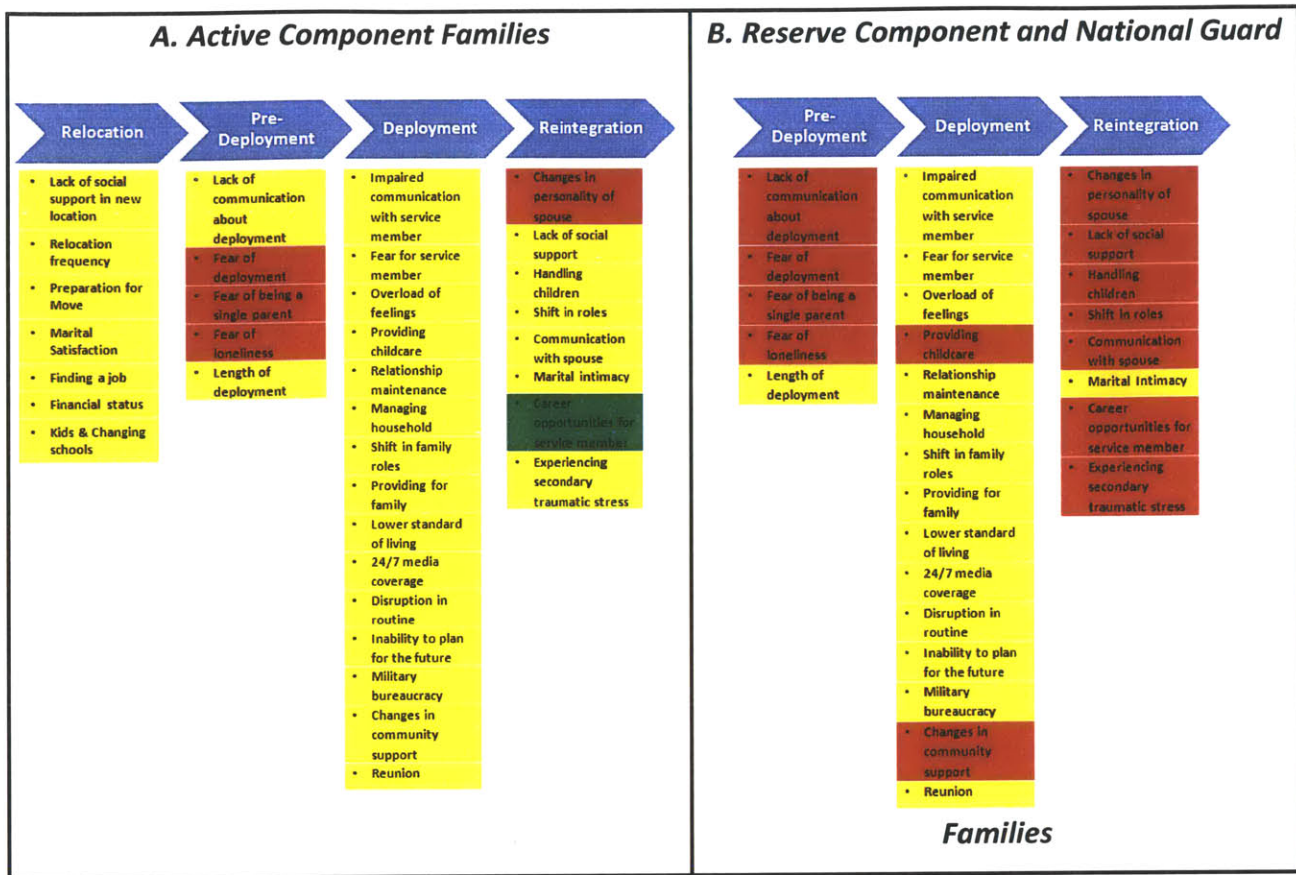


Figure 11: Military Family Values across 4 stages. A. Active Component Families and B. RC and NG Families. (Note: RC and NG are defined as Reserve Component and National Guard, respectively. Green represents that system currently meets families' need), yellow represents that the current system somewhat addresses families' needs, and red represents that the current system does not address families' needs.)

Overall, we found that the stressors impacting the active component vs. the RC and NG were similar, but were distinct in two main areas, which included minimal relocation by RC and NG service members and their families and the lack of services during reintegration for RC and NG service members and their families. As shown in Figure 11, both populations faced similar stressors and minimal services provided prior to deployment with regard to fear of deployment, fear of being a single parent, and fear of loneliness. However, as stated previously, RC and NG families feel that they currently do not receive adequate communication prior to deployment (Figley, 1993). For instance, Figley states that, "little is understood with regard to the activation and deployment of National Guard and reserve unit personnel and their families and the impact on the spouse and marriages associated with war deployment." In addition, the 2007 "What We Know" report found that most RC Army spouses did not expect their Soldiers to be mobilized and tended to be unprepared psychologically and administratively when mobilization



orders were received. Because RC and NG family members are not embedded within the military communities on bases, they often are disconnected from services and supports provided by this network and are left out of the system of care. This is further highlighted by the inability of the current system to meet the needs of RC and NG family members during deployment with regard to providing childcare and community support. It was found that only a small minority (4%) of spouses of activated RC services members took advantage of the military child care services available during their service member's activation. In addition, many employed Army NG spouses with children have reported difficulty both working full time and providing care for children as a single parent as shown in Figure 11. In some cases, child care demands forced spouses to quit their jobs or reduce their hours. A 2003 study by Burrell, Durand, & Fortado found that a year-round family support infrastructure tended to be lacking in RC units. In a 2003 study on military community integration, for example, only about half of spouses of ARNG Soldiers and USAR Soldiers (54% and 52%, respectively) reported that their Soldier's unit had a Family Resource Group compared with well over three-fourths (88%) of AC spouses. Also only forty percent of ARNG spouses were satisfied or very satisfied with the support receive from their Soldier's unit.

In addition, RC and NG members often are disconnected from the system because they encounter several barriers to obtaining healthcare services through the TRICARE system while their service member is deployed. When their RC service member is activated, many family members transition between civilian health insurance to TRICARE, and then are forced to transition back after their service member returns home from deployment. For example, a study completed by Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs in 2003 found that roughly one-half of families of ARNG and USAR Soldiers activated in 2002 (56% and 49%, respectively) relied exclusively on TRICARE for their health coverage during the activation. They stated that the transition to and from TRICARE can be "time consuming, confusing, and logistically challenging." Many spouses often face this transition alone and find it difficult to find civilian providers that will participate in the TRICARE plan. Even once they identify civilian providers that accept TRICARE, the providers do not communicate with the MHS enterprise, which further emphasizes how these families can get "lost" within the

continuum of care (if they even receive psychological services at all) and not receive adequate support.

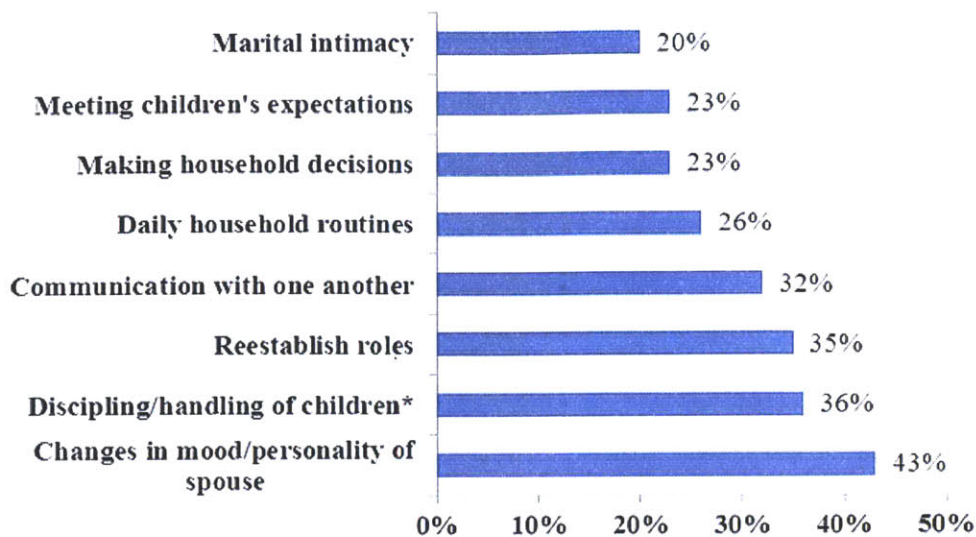


Figure 12: Percentage of spouses that responded “difficult” or “very difficult” to survey questions surrounding their spouse’s return home from deployment. Note: \* indicates the percentage among spouses with children. (Source: 2004/2005 Survey of Army Families, U.S Army Community and Family Support Center (CFSC))

Both families of AC and RC/NG service members face considerable stress with regard to changes in personality of the spouse during reintegration. Figure 12 above highlights data collected during a 2004 Survey of Army Families by the U.S Army Community and Family Support Center (CFSC), where they identified this stressor as the number one concern, along with handling of children, reestablishing family roles, and communication with spouses. The largest disconnect between AC and the RC/NG took place during the reintegration stage, which is primarily because MHS no longer provides services to the RC/NG and their families at this stage. Specifically, the families of the RC and NG do not hear from military family support after deployment is over. For example, a National Guard Bureau Attrition and Strength Maintenance Branch 2006 study showed that more than four-fifths (81%) of Army NG families indicated that no one in the unit or FRG contacted them to check on their family’s adjustment to the Soldier’s return and the transition to inactive status.

### **Fieldwork Analysis of Enterprise Stakeholders and their Values**

Based on this initial analysis of enterprise stakeholders and their values, we then performed the next stage of research through fieldwork and site visits to the major force

projection platforms in the Army. When you dive into the field work, we saw how these stakeholder relationships evolve. In particular, I will focus the following stakeholder analysis on four site visits and narrow our search to the Army. Appendix A highlights a detailed analysis of the major stakeholders, the value expected from the enterprise, and the values they contribute to the enterprise. These values were drawn from our site visit reports (Scott, 2012).

Based on this stakeholder value analysis, we found several central themes among values and needs across the various stakeholder groups. In particular, we decided to focus on the values and needs across three principle stakeholder groups: active duty service members, reserve component/national guard (RC/NG), and families, who appeared to have the most demanding and complex needs based on our analysis. Combining both stakeholder analysis methods based on literature reviews and field work, access to and timely care emerged as specific areas where the enterprise is not delivery values to these stakeholder groups. Therefore, Figure 13 summarizes the evolution of these needs across pre-deployment, deployment, and reintegration.

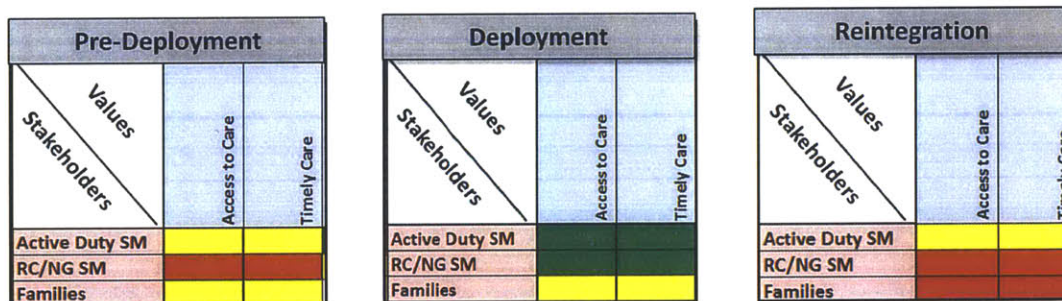


Figure 13: Stakeholder needs assessment across the life cycle (Note: Red is defined as not meeting stakeholder needs, Yellow is defined as partially meeting stakeholder needs, and green is defined as meeting stakeholder needs)

By assessing stakeholder values across the life cycle, we found that there is a strong need to improve the continuity of care and accessibility of services for RC, NG, and families. It is important that we understand how to transform the current system of care to better meet stakeholder needs of active duty service members, RC/NG service members, and families. Technology is one way to transform the enterprise to provide better access to and timely care. However, introducing new technology into clinical workflow should not be taken lightly. As stated by Chau and Hu, “The proliferation of technology in supporting highly specialized tasks

and services has made it increasingly important to understand the factors essential to technology acceptance by individuals” (Chau and Hu, 2002). To understand how we architect the future system of care, I will take a closer look at the current literature to date surrounding technological evolution and change. Specifically, telehealth (as discussed in the previous chapter), is one potential technological solution for increasing access to timely care for service members and their families. We need to understand how technology introduces change in an organization, the use of telehealth in healthcare, and the concept of technological systems. Therefore we will perform literature reviews on each of these streams in the next chapter.

## ***Chapter 3: Literature Review***

### ***Introduction***

The field of telehealth is an evolving field of medicine that will have dramatic implications for healthcare systems as costs continue to rise and there is a greater need to provide care outside of hospital walls to deliver better access to timely, more coordinated care. As defined by the American Telemedicine Association (ATA), telemedicine specifically is “the delivery of any healthcare service or transmission of wellness information using telecommunications technology” (ATA, 2012). The term telehealth is used “to encompass a broader definition of remote healthcare that does not always involve clinical service.” Overall, telehealth is viewed as a complex system with many subsystems spanning from the video infrastructure to electronic medical records and scheduling systems to staffing and organizational system to policies and reimbursement systems. Telehealth can provide real time therapy or also provide more proactive treatments to prevent further complications in the future. As stated by Igras et al, telehealth “can facilitate the changes in the delivery of care services to more proactive methods that rely on monitoring of health conditions and trend data analysis to predict health, rather than reacting to medical conditions as they occur” (Igras et al, 2003).

Telehealth has evolved dramatically from its inception with the NASA manned space flight program, where biomedical telemetry and remote sensing in combination with communication with flights surgeons in mission control was utilized to monitor the health of astronauts in space (Bashur, 2000). However, it was not developed entirely from the NASA. Dr. Thomas Bird created the first prototype of a telehealth system using an AV microwave circuit between the Massachusetts General Hospital and Logan Airport in Boston (Murphy and Bird, 1974). They conducted over 1,000 medical consultations for airport employees and travelers based out of a primary care clinic. Dr. Bird was also the person who coined the term telehealth, which translates into “healing at a distance.” Despite the development of this prototype system, Dr. Bird’s program was cancelled because “the technology was expensive, cumbersome, and unreliable” (Bashur, 2000). Despite the early ending of this system, this work helped show both the “technological feasibility of telemedicine, its ready acceptance by both

providers and clients who use it, the substitution of technology for travel, and the potential for greater coordination of medical and administrative function within large institutions.” Since the 1970s, telehealth has grown, especially with a surge in 1990s and 2000s, due to the growth of information and telecommunication systems. In addition, several federal policies associated with licensing, reimbursement, and broadband growth have helped encourage the development of telehealth within the United States and currently every state has at least one telemedicine program. Despite this, the growth of telehealth faces many challenges, which will be further described in Chapter 4. Some of the challenges include, but are not limited to, cost, stakeholder adoption, outdated policies and regulations, antiquated infrastructure and technology systems, process variations, integration barriers, and organizational impediments. To further expand on the complexity of telehealth, I will first discuss the current telehealth literature and then the literature surrounding the evolution and adoption of complex technology systems, which will then lead to a presentation of the proposed framework for studying telehealth in the context of a large healthcare delivery system.

### *Telehealth Literature*

Telehealth has several diverse modalities, which include videoconferencing, mobile health, transmission of still images, e-health including patient portal, virtual reality, remote monitoring of vital signs, and collaborative care (Wade et al, 2010). Telehealth can be delivered synchronously (i.e. in real-time where the providers and patients interact with each other simultaneously) and asynchronously. The following paragraphs summarize some current literature surrounding each of these various telehealth modalities. In addition, each of these modalities could be segmented by specialty (psychological health, primary care, cardiology, diabetes care, hematology, ICU, neurology, oncology, nutrition, orthopedics, audiology, optometry, respiratory, wound management, pediatrics, physical therapy) and type of provider (doctor, nurse, case manager). For the purposes of this work, I will first describe some of the literature within each modalities listed above, and then focus on a more thorough literature review of telebehavioral health work to provide further context for our research on telebehavioral health within the MHS enterprise.

## **Telehealth Modalities**

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First, telehealth services delivered via the video teleconference (VTC) modality have demonstrated clear benefits in literature. A recent study by Gonsalves in 2008 found that video-related technologies helped providers improve the efficiency of care delivery by cutting in half the number of children it had to transfer to a larger medical center over 70 miles away (Gonzalez, 2008). Specifically, the number of transfers decreased from 140 to 70 and the associated cost with one transfer is approximately \$40,000. Therefore, only the sickest patients were sent to the larger medical center and this saved money to the overall system. In addition, a presentation made by Kenneth McConnochie at the Pediatric Academic Society Meeting in 2008 found that telemedicine could decrease unneeded emergency room visits (McConnochie, 2008). The study conducted out of the University of Rochester Medical Center found that “28% of all visits to the emergency department could have been replaced by a more cost-effective telemedicine-based doctor’s visit. There is a mismatch of needs and resources, which is inefficient, costly and impersonal for everyone involved.” Telehealth treatments delivered via VTC help provide care to patient in remote areas. For example, a 2011 study by Blank et al described the Army’s orthopedic consultation program to service members in austere areas in Iraq and Afghanistan (Blank et al, 2011). They found that only 25% and 16% of the requests for surgical intervention or medical evacuation, respectively, occurred due to the use of the telemedicine consultation program. Because providers were able to speak with injured service members over VTC, they were able to limit the number of unnecessary medical evacuations and thereby save patient time and cost and risks associated with medical evacuations. Along with reducing visits in high risk situations, telehealth treatments delivered via VTC are also heavily utilized in rural settings. For instance, a study by Dakins found that teleradiology treatments are utilized in greater than 50% of all radiology practices in the United States and account for 2/3 of all the state-based telehealth programs because they diagnose stroke within the 5 hour “golden window” that is needed to administer tissue plasminogen activator (tPA) to stroke patients (Dakins, 1997).

Second, mobile health has also grown in the past in ten years due to the penetration of mobile technologies worldwide. It is currently defined that 85% of the world’s population is

covered by a wireless signal with over 5 billion mobile phone subscriptions. Mobile health or mhealth is defined as “the use of wireless communication devices to support public health and clinical practice” (Kahn et al, 2011). The World Health Organization also defined eight mHealth application areas, including education and awareness systems, point of care support and diagnostics, patient monitoring, disease and epidemic outbreak surveillance, emergency medical response systems, health information management systems, mLearning, and health financing. In addition, the FDA issued draft guidance surrounding mobile health applications in July 2011 (Barton, 2012), where they defined mobile health applications as “applications on a wireless device that are used as accessories to medical devices or to convert a mobile platform to a medical device” (FDA, 2011).

The third modality associated with telehealth is the transmission of still images. Also discussed earlier in VTC modality, telestroke treatments have dominated state-based telehealth programs over the past two decades. In a study by Dunlea et al, telestroke has demonstrated a net financial benefit in the context of decreasing transportation costs and increasing appropriate tPA administration leading to decreased stroke care costs (Dunlea et al, 2008). Specifically, the results of the study demonstrated that “full deployment of telestroke technology could save \$1.1 million in North Carolina or \$40 million nationally in transportations costs alone, off-setting the costs of telestroke deployment. Additionally, telestroke would allow over 600 additional people to receive tPA in North Carolina or over 20,000 people nationally. The additional tPA administration would result in over 120,000 quality adjusted life years annually, each with a savings of hundreds of dollars, results in hundreds of millions of dollars in healthcare system savings.” Transmission of still images also has implications for other radiological uses and other imaging technologies, such as a MRI, CT scans, and X-rays.

The fourth modality of telehealth includes the use of electronic health patient portals, which are abbreviated as e-health. Specifically, e-health has several benefits for disease management. A study by Digital Health Group of Intel Corporation found that e-health, along with our fifth modality of remote monitoring of vital signs, has “the promise to be a catalyst for the next generation of disease management, especially by supporting truly personalized healthcare regimes for patients. Technology will create a new, interactive conduit to allow for



more appropriate and timely interventions, real-time and integrated data reporting, and dynamic two-way communication between patients and health professionals” (Cheitlin, 2008). Telehealth has reduced mortality rates and allowed shorter in-patient hospital visits in intensive care units (Smith, 2011). Providers remotely monitored close to 6,300 patients in ICUs for a period of two years and responded to electronic alerts and alarms with treatments when necessary. Through this study conducted at the University of Massachusetts Medical Center, they “found that after implementing the telehealth program that hospital mortality rates dropped from 13.6% to 11.8%, patients' average length of hospital stay dropped from 13.3 days to 9.8 days, ICU mortality rates dropped from 10.7% to 8.6%, patients' average length of stay in the ICU dropped from 6.4 days to 4.5 days, and rates of adherence to best clinical practices increased and rates of preventable complications decreased.” Due to success of remote patient monitoring studies across the United States, the home telehealth patient monitoring market is on target to grow by over 70% in the next 3-5 years according to a report published by Insight and Intelligence (Mitchell, 2008). In addition, e-health and remote patient monitoring can help provide preventative measures prior to the onset of chronic diseases. For instance, a study by Bosworth et al found that “people trained to monitor their blood pressure at home, who also received regular calls from a nurse, lowered their blood pressure by 11 percent, compared to a 7.6 percent decrease in blood pressure for a home monitoring-only group and 4.3 percent for people who only received phone calls” (Bosworth et al, 2009). This study also demonstrated that these interventions were done at minimal costs compared to the treatments which would have been required with increases in blood pressure.

### **■ *Telebehavioral Health Literature***

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Due to the nature of our work examining the system of care for service members and families faced with post-traumatic stress and other related disorders, the authors have opted to further examine the current telebehavioral (TBH) research with a particular focus on behavioral health services conducted using the video teleconference modality, which is also the most documented and studied type of telebehavioral health treatment. Appendix B below highlights the outcomes of several telebehavioral studies, including several randomized controlled trials (RCTs). Overall, the current telebehavioral health literature has several major trends:

- No differences were detected between telebehavioral treatment groups and face to face treatment groups according to clinical and process outcomes.
- Telehealth services were observed to be more expensive in studies, but these expenses disappeared when providers had to travel to remote clinics to provide behavioral health services.
- Clinical trials for telebehavioral health are still relatively small (ranging from 13-534 patients) suggesting the need for more larger studies examining telebehavioral in practice.

Based on this analysis of current literature shown in Appendix B, TBH is still in its infancy and further research studies need to be conducted to examine not only the clinical outcomes of TBH treatments, but also the TBH system as a whole to understand how to best architect TBH in the future state as the system continues to evolve. Along with understanding the technology and clinical treatments at the core of TBH, it is critical to consider the adoption of TBH treatments by the system stakeholders. Therefore, I will take a closer look at the current technological evolution and adoption literature to understand how to best architect a system of care surrounding TBH treatments in the future, therefore allowing it to properly integrate into clinical workflow, patient's activities, and other stakeholder's processes and behaviors.

### *Technological Adoption and Evolution Literature*

Technology evolution literature consists of a vast library of work examining the progress of innovation across many industries ranging from assembled products (such as cars or personal computers), nonassembled or homogenous products (such as glass), or services (healthcare, hospitality, etc.) (Utterback, 1994). In 1983, Richard Foster first described the relationship between the amount of work applied to developing a product or technology in comparison to the performance of the product or technology. Through his research, he developed the technology S-curve. He states the "S-curve is a graph of the relationship between the effort put into improving a product or process and the results one gets back from the investment...Initially as funds are put into developing a new product or process, progress is very slow. Then as hell breaks loose as the key knowledge necessary to make advances is put in

place. Finally, as more dollars are put into development of a product or process, it becomes more and more difficult and expensive to make technical progress” (Foster, 1986). In addition, Abernathy and Utterback wrote several articles in the 1970s discussing the dynamics of innovation in the context of product and process innovation (Utterback & Abernathy, 1975; Utterback & Abernathy, 1978). They describe the rate of innovation to occur in three phases: 1) fluid phase, 2) transitional phase, and 3) specific phase. Each of these phases is characterized by certain hallmark properties based on the competitive emphasis, stimulation of innovation, and the predominant type of innovation. The fluid phase is composed of trial & error, many competitors/players, inefficient processes, and informal structures, which gradually evolves to the translational phase with major process improvement, less competitors, and project and task focused structures. Finally, a specific phase arises, which is composed of incremental improvements, scale-driven highly efficient processes, a stable number of competitors, and highly structured organizations. They discuss the role of the emergence of a dominant design, which is defined as “the one that wins the allegiance of the marketplace, the one that competitors and innovators must adhere to if they hope to command significant market following” (Utterback, 2004). The dominant design often goes through a period of iteration and flux prior to emerging as a dominant design. For instance, they state “technological discontinuities usher in eras of ferment, where technical substitution, design competition and change in the existing technical order occur; technological uncertainty is high (Clark, 1985). The rise of a dominant design decreases technological uncertainty, causing engineers to direct their attention to refining existing products and processes during the subsequent era of incremental change” (Utterback and Abernathy, 1975; Dosi, 1984; Basalla, 1988).

Along with the evolution of individual technologies, it is also important to consider the adoption or diffusion of technology or innovations. Rogers describes innovation as “an idea, practice, or object that is perceived as new by an individual or other unit of adoption” (Rogers, 1983). In this publication, he places users of innovations into five separate categories: innovators (2.5% users), early adopters (13.5% users), early majority (34% users), late majority (34% users), and laggards (16% users). As an innovation continues to gain market share, it is gradually adopted by more users gradually progressing through the aforementioned categories.

Dosi also attempts to describe technology evolution in terms of technology trajectories and he defined technology as a “set of pieces of knowledge, both directly "practical" (related to concrete problems and devices) and "theoretical" (but practically applicable although not necessarily already applied), know-how, methods, procedures, experiences of successes and failures and also physical devices and equipment” (Dosi, 1982). In his work, he describes a model where several disciplines fuel the innovative process (not just the market), which include the “interplay between scientific advances, economic factors, institutional variables, and unsolved difficulties on established technological paths.” In addition, Tushman and Anderson describe the evolution of technology through periods of “incremental change” interrupted by “technological breakthroughs or technological discontinuities” (Tushman and Anderson, 1986). They then discuss the role of technological discontinuities in firms, where they state that their “study shows that while competence-destroying discontinuities are initiated by new firms and are associated with increased environmental turbulence, competence-enhancing discontinuities are initiated by existing firms and are associated with decreased environmental turbulence. These effects decrease over successive discontinuities. Those firms that initiate major technological changes grow more rapidly than other firms.” They highlight the role of the organization in shaping these technological discontinuities as a major driver of innovation. For instance, they state “two critical characteristics of organizational environments are uncertainty and munificence. Uncertainty refers to the extent to which future states of the environment can be anticipated or accurately predicted (Pfeffer and Salancik, 1978). Munificence refers to the extent to which an environment can support growth. Environments with greater munificence impose fewer constraints on organizations than those environments with resource constraints.” Levinthal further discusses the role of technological discontinuities and justifies these theories using the punctuated equilibrium framework from evolutionary biology (Levinthal, 1998). He states “using this framework, it is argued that the critical event is not a transformation of the technology, but speciation—the application of existing technology to a new domain of application. As a result of the distinct selection criteria and the degree of resource abundance in the new domain, a new technological form may emerge. The new technological form may be able to penetrate other niches and, in particular, may precipitate a

process of 'creative destruction' and out-compete prior technologies.” Finally, the work of Arajuo and Harrison applies the framework of path dependence to explain technological trajectories and evolution (Arajuo and Harrison, 2002). They state “path dependence can contribute to technological development through the reuse of existing knowledge, the ‘black-boxing’ of some problems and allowing developers to focus on more restricted and soluble problems.” These works can be directly applied to studying the evolution of telehealth systems. The underlying technological infrastructure of telehealth systems, video teleconference, was initially developed within the telecommunications and more recently applied to healthcare. In the upcoming paragraphs, I investigate technology as a complex system, which can help characterize the evolution of the telehealth system within the Army as it continues to scale and evolve. This analysis of the evolution of the telehealth system will occur in Chapter 4.

The complexity of telehealth is far beyond mere technology and a closer look at the technology systems literature can help us shape a framework for examining telehealth within the Army moving forward. Murmann and Franken provide a systematic framework for examining technology as complex systems (Murmann and Franken, 2006). They stress that “at the heart of dominant design thinking lies the empirical observation that technology evolves by trial and error and thus entails risks...small changes in design may have large, disruptive consequences for the functioning of the complete artifact. Interdependencies imply that some parts of an artifact cannot be improved without making accompanying innovations in other parts” (Murmann & Franken, 2006 and Rosenberg, 1969). Henderson and Clark also provide an innovation framework to distinguish four types of innovations: incremental, modular, architectural, and radical (Henderson and Clark, 1990). They characterize each of these four different types of innovations systems by whether the core concepts of the system are reinforced or overturned and also categories the innovations based on the linkages between the core concepts and system components. In a technology system, nested systems or subsystems can take different forms innovation within one larger system, such as a “modular innovation at one level in the hierarchy can clearly be an architectural or radical innovation at a lower level of hierarchy” (Henderson and Clark, 1990). Murmann also suggests that these

technological subsystems can evolve through “processes of variation, selection, and retention” to eventually form “a dominant design as a standardized core components and interfaces.”

Along with considering the evolution of the technological infrastructure of telehealth, it is also critical to examine the social and organizational component of telehealth, which help define it as a complex, sociotechnical system. For instance, Bashur stated “telemedicine is a complex innovation bundle in that it is a technical as well as an organizational and social innovation” (Bashur, 2000). Sociotechnical systems can be defined as “a cluster of elements, including technology, regulations, user practices and markets, cultural meanings, infrastructure, maintenance networks, and supply networks” (Elzen et al, 2004). Each of these different elements are interdependent on one another and “transitions at the societal level then involve a change from one socio-technical system to another, which is a system innovation.” In addition, Malerba introduces another category of systems called sectoral systems, which are “based on three building blocks: knowledge and technologies, actors and networks, and institutions” (Malerba, 1999) and further extend the idea of several elements (not just technology) composing and influencing large, complex systems. Carlsson and Stankiewicz define the central features of technological systems as “economic competence (the ability to develop and exploit new business opportunities), clustering of resources, and institutional infrastructure” (Carlsson and Stankiewicz, 1991). Lynn et al further supports this definition and argues for the importance of linking technology to the institutional environment in which it exists. For instance, they state “the technological innovation and diffusion literatures consistently suggest the importance of the institutional environment, including non-market as well as market organizations and relationships, in the commercialization of innovation...We need systematic field work which gives a better sense of what the alternative institutional arrangements may be for carrying innovations out” (Lynn, 1996). Geels further explains the relationship between innovation and the external environment. He states “while regimes usually generate incremental innovations radical innovations are generated in niches. Because these niches are protected or insulated from ‘normal’ market selection in the regime, they act as ‘incubation rooms’ for radical novelties” (Lynn, 1996 and Schot, 1998). He further explains that the Army has produced many radical innovations, such as digital computers, jet engines,

radar, due to evolution of their early technology in niches, which help provide a learning environment to literature and build these innovations. Geels coined the term “technological transition” and highlights the importance of “the multi-level perspective that the further success of a new technology is not only governed by processes within the niche, but also by developments at the level of the existing regime and the sociotechnical landscape.”

Rip and Kemp further explain the role of niches in evolving technology at the ground level to influence socio-technical regimes and eventually impact the overall technology landscape. They state that “it is the alignment of developments (successful processes within the niche reinforced by changes at regime level and at the level of the sociotechnical landscape) which determine if a regime shift will occur” (Rip & Kemp, 1996). In turn, pressures at the landscape level can create opportunities for new innovations and technologies to overcome adoption barriers.

Hughes further expands on the evolution of large technological systems, which often occurs due to external demand (Hughes, 1987). He states “in contrast to most of the literature in evolutionary economics, we demonstrate that the emergence of new technological paradigms can be enabled by demand, whereas the further course and direction of development can be enabled by knowledge development...A technological paradigm refers to the core knowledge base involved in a specific field of technology and to common aspects of the problem solving activities of engineers in that field.” He later defines seven stages of evolving systems, which includes invention, development, innovation, transfer, and growth, competition, and consolidation. Leonard takes this work a step further to describe the importance of technology implementation in these stages of system evolution (Leonard, 1988). He states “the adaptation process is necessary because a technology almost never fits perfectly into the user environment. Even though developers reduce the uncertainty inherent in the innovation process by technical iterations and prototyping.” Leonard introduces the concept of “mutual adaption” for large technical systems, which involves “the re-invention of the technology and the simultaneous adaptation of the organization...Implementation is innovation.” He describes the types of misalignments, technical, delivery system, and performance criteria, which can initially slow down the mutual adaption process. Leonard

highlights that the introduction of new technologies and systems will be a dynamic, learning process requiring beta testing, prototyping, and iterations with the system developers to better align the technology within the user environment and organization.

Orlikowski then evolves the mutual adaptation theory further describing technology as an enabler, but not the cause of organizational transformation (Orlikowski, 1996) in her introduction of the situated change perspective. She states “the transformation, while enabled by the technology, was not caused by it. Rather, it occurred through the ongoing, gradual, and reciprocal adjustments, accommodations, and improvisations.” This is in contrast to Gersick’s punctuated equilibrium theory described earlier, where he states that “relatively long periods of stability (equilibrium) [are] punctuated by compact periods of qualitative, metamorphic change (revolution). Punctuated discontinuities are typically triggered by modifications in environmental or internal conditions, for example, new technology, process redesign, or industry deregulation” (Gersick, 1991). Similar to the mutual adaptation process discussed above, Garud and Rappa describe that “technological development is a co-evolutionary phenomenon”, where “there is a continual and reciprocal interaction between a technology and its environment” (Garud and Rappa, 1991; Rosenkopf and Tushman, 1993). This was further validated by Tushman and Rosenkopf studying technology development with aerospace organizations, where they state that “interorganizational networks and communities socially construct technological change; in turn, technological outcomes determine the evolution of organizations and communities” (Tushman and Rosenkopf, 1993). Orlikowski and Gash discuss the role of technological frames as one tool to further understand this gradual transformation of organizations enabled by technology. Based on this work, Kaplan and Trispas further stated that “technological frames [can] shape how actors categorize a technology relative to other technologies and which performance criteria they use to evaluate the technology. Actors’ technological frames do not spring up randomly, but rather are the encoding of their prior history, including both idiosyncratic organizational experiences and industry affiliations” (Kaplan and Trispas, 2008). They utilize cognitive lenses to understand the co-evolution of technology across its life cycle within these technological frames. Specifically, they propose “diverse technological frames are a source of variation in the era of ferment, that framing



activities help drive the achievement of a dominant design when one emerges.” Once a dominant design is implemented, it is often hard to integrate disruptive technologies because of the “intertwining of technological frames and organizational architecture in the era of incremental change.” Therefore, they focus on the dynamics associated with each actor’s technological frames, the collective technological frame, and the evolution of technology. Utilizing these learnings from this review of literature, we hope to apply the concept of technological frames (or lenses) as a tool to examine the evolution of telehealth within Army to better understand the current state. The following section summarizes our approach with enterprise lenses to study the telebehavioral health system of care.

***Proposed Framework for Studying Telebehavioral System of Care***

As discussed in the introduction, our goal is to examine the telebehavioral system of care as a force extender to provide better access to care for service members and their families. To better understand the current state of telehealth within the Army, we propose utilizing frames or lenses to take a closer look at this complex system with the goal of architecting the future system of care. Nightingale and Rhodes propose the use of seven “lenses or views” to offer a perspective on the enterprise that help us isolate unique areas of focus, reduce complexity to help us understand the enterprise as a whole, and helps provide unique perspectives to address the enterprise’s diverse stakeholders (Nightingale and Rhodes, 2012). They propose the use of eight views, which includes strategy, policy, processes, organization, information, knowledge, products, and services. However, based on our initial field work, we propose adapting these eight views to better match the study of healthcare delivery systems by utilizing the following views outlined in Table 2 below and defined in Nightingale and Rhodes.

**Table 3: Enterprise Architecting Views (Nightingale and Rhodes, 2012)**

Views	Definition
Strategy	The vision, strategic, goals, and enterprise level metrics
Poicy	The external regulatory, political and societal environments in which the enterprise operates
Services	The offerings derived from enterprise knowledge, skills, and competencies that

	deliver value to stakeholders
Processes	Core, leadership, lifecycle and enabling processes by which the enterprise creates value for its stakeholders
Infrastructure	Systems and information technology, communications, technology, and physical facilities that enable enterprise performance
Organization	The culture, organizational structure, and underlying social network of the enterprise
Knowledge	The competencies and explicit and tacit knowledge resident in the enterprise

In addition, they highlight the importance of considering both the external ecosystem and stakeholders, which are further defined below as (Nightingale and Rhodes, 2012):

- Ecosystem: “The exogenous element that is characterized by the external regulatory, political, economic, and societal environment in which the enterprise operates and competes/cooperates with other related enterprises.”
- Stakeholders: “Enterprise stakeholders are individuals or groups who contribute to, benefit from, and/or are affected by the enterprise.”

Therefore, the following chapter presents a current state analysis of the evolving TBH system of care within the Army utilizing the aforementioned seven views, external ecosystem, and stakeholders as a framework to breakdown and transform this evolving, complex system.

## Chapter 4: Current State Analysis of Army TBH Enterprise

### Introduction

The goal of this chapter is to present the current state of TBH delivery within the United States Army and use these findings as a baseline to architect the future TBH delivery system within the Army. To analyze the TBH system across the Army, we built an understanding of the Army TBH systems through focused interviews with telehealth providers and support staff. The team refined our initial baseline using a second round of interviews with additional telehealth stakeholders, which will be outlined further below. We focused on interviewing some of the same stakeholders at least 6 months – 1 year apart to gain a longitudinal understanding of the evolution of tele-behavioral health needs. Overall, we have interviewed 51 stakeholders across the Army TBH health enterprise. These stakeholders groups represent service members, regional medical commands (telehealth chiefs and providers), health policy, information technology, technological infrastructure, behavioral health leadership, the AMEDD Telehealth Office, MRMC leadership and staff, Reserve Component (RC) and National Guard (NG) leadership, privileging staff, and program analysis and evaluation. The summary of our interviews is shown below in Figure 14.

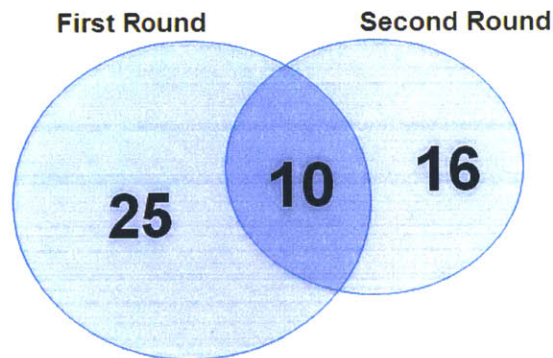


Figure 14: Summary of Army TBH Enterprise Interviews

To further support the context of this study, over the last two years our team has interviewed 520 stakeholders across the entire Army Behavioral Health enterprise and visited 11 Army posts, camps and stations, to develop the current state architecture of the Army Behavioral Health enterprise in the large. In addition, one item to note is that although this chapter is focused on TBH, we will touch on concepts that are inclusive of the entire Army telehealth

enterprise to avoid focusing on TBH as a stove-pipe. After completing both rounds of interviews, we organized a workshop at MIT with Army stakeholders where we gained feedback, validated our current state findings, and developed recommendations which were used as “enterprise requirements” for architecting the future state (discussed in Chapter 5). We utilized the seven views of enterprise strategy, policy, services, processes, infrastructure, organization, and knowledge, as defined by Nightingale and Rhodes (2012) to map out the current state of TBH delivery (and defined in Chapter 3). These views or lenses offer a perspective on the enterprise that help us manage complexity by isolating unique areas of focus to understand the enterprise as a whole. In addition, it was also critical to understand two other elements, the external ecosystem and stakeholders of the enterprise, to fully capture the TBH architecture within the Army. In summary, we engaged key stakeholders to define the value proposition, leveraged multiple views to construct the “as-is” enterprise, collaboratively developed a vision for the desired future state architecture with enterprise stakeholders, and utilized rigorous enterprise analysis to select the “to-be” architecture which will be discussed in Chapter 5.

### ***Army TBH Overview***

Army telehealth first began in 1992 during a deployment to Somalia and organically grew across the enterprise to eventually include the establishment of the tele-TBI/tele-BH VTC network across MEDCOM in 2008 and the AMEDD Telehealth Office to coordinate telehealth within Health Policy & Services (HP&S) in 2010. A summary of the evolution of Army telehealth is shown below in Figure 15.

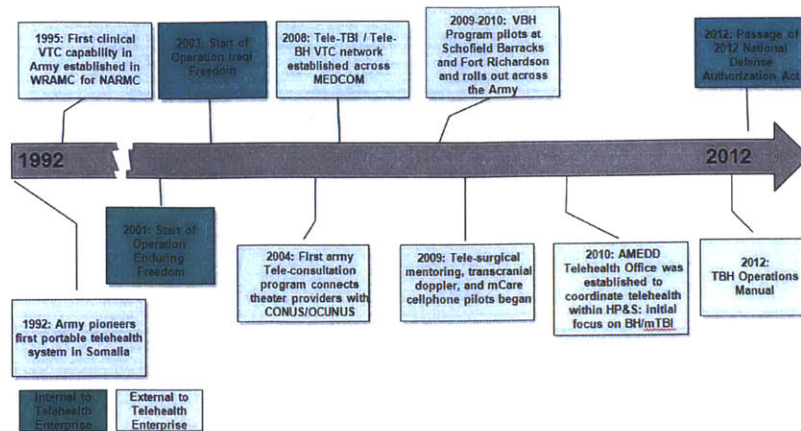


Figure 15: Summary of Army Telehealth Evolution (Adapted from ATA Presentation, Dr. Rye, June 2011)

As telehealth developed across the enterprise, Army telehealth primarily grew to support regional and local needs. There were several examples of evolution of telehealth across the enterprise highlighted during our interviews. A common theme that emerged in the interviews was that telehealth often began as a proof of concept to determine the types of services that could be delivered using the telehealth modality. In one region, telehealth evolved because the hospital had become overrun and hospital staff first developed a telehealth function “naturally” and then validated their strategy at a later date at a National Center for Telehealth & Technology (T2) conference. Another region began by conducting one-time administrative evaluations, where TBH started off as a feasibility project and included metrics upfront to communicate the results of the project to other stakeholders. Another region setup one of their TBH programs in six weeks and explained that the primary challenge was establishing the infrastructure (specifically, the bandwidth and AHLTA access for providers). They needed significant support to establish the program and ended up costing more than the physically surging providers using temporary duty assignments (TDY) (In contrast, during other interviews several interviewees stated that telehealth has reduced the need for TDY on numerous occasions, thereby saving provider time and money). Based on this initial project though, the region was able to learn and standardize the service and organize operations people to coordinate the multiple streams of care. In summary, some regions developed telehealth as proof of concept, while others developed telehealth to meet local needs. This is similar to the

occurrence of technology discontinuities through “niches” outlined by Levinthal and discussed in Chapter 3 (Levinthal, 2003).

Army telehealth gradually evolved through pilot tests across the enterprise. In several instances, telehealth allowed for a more flexible system to help with surge augmentation and subsequently allowed some service members better access to care, sometimes to remote locations with fewer specialty care resources. As one provider stated, “telehealth is a way of rethinking the delivery platform to allow us to reach populations that are not viable for us.” We heard numerous examples demonstrating the value of telehealth across the enterprise from a range of stakeholder groups (examples detailed across the report, and more specifically in the ‘services’ section). Despite the value of telehealth across the Army enterprise, several enterprise level challenges exist due to the gradual evolution of the infrastructure and processes, the significant growth rate of TBH encounters in recent years, and the demonstrated successes using TBH. Many providers commented on the “growing pains” of TBH as manifested in the many workarounds needed to execute telehealth encounters, and in fighting the perception that telehealth is ‘second tier care’. As one provider stated “it is not second tier care. We find it superior to face to face in some cases. For instance, the patients in American Samoa prefer it because it is such a small community there and they don’t want to run into their provider in the grocery store.” By 2012, the Army telehealth was just peaking with the early majority population, which is depicted below in Figure 16 adapted from Rogers (Rogers, 2003; This was originally presented by Dr. Colleen Rye, Chief of Telehealth of the Army, at our workshop). For instance, it was stated by one enterprise stakeholder “By 2012, telehealth was gradually institutionalized through clarification of policy questions and operational processes and increasing provider comfort with modality.”

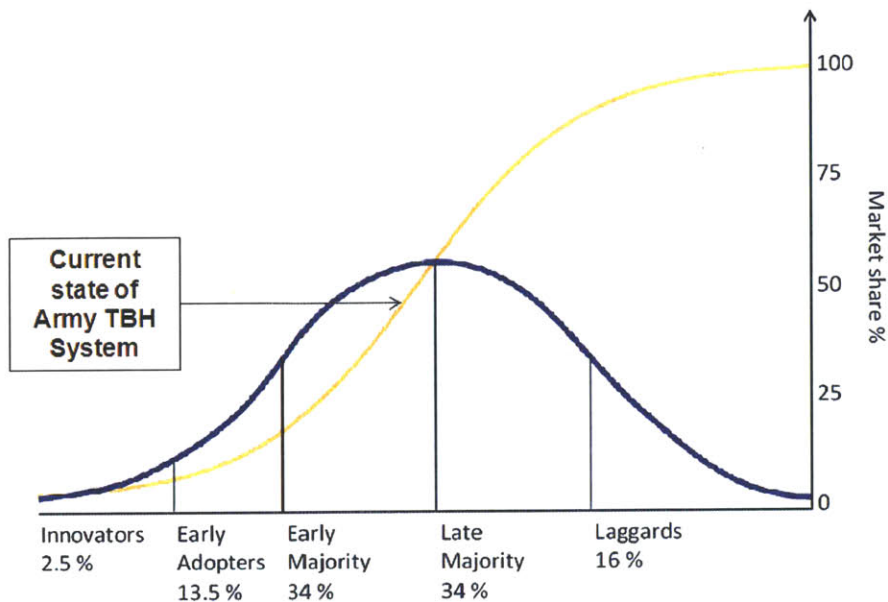
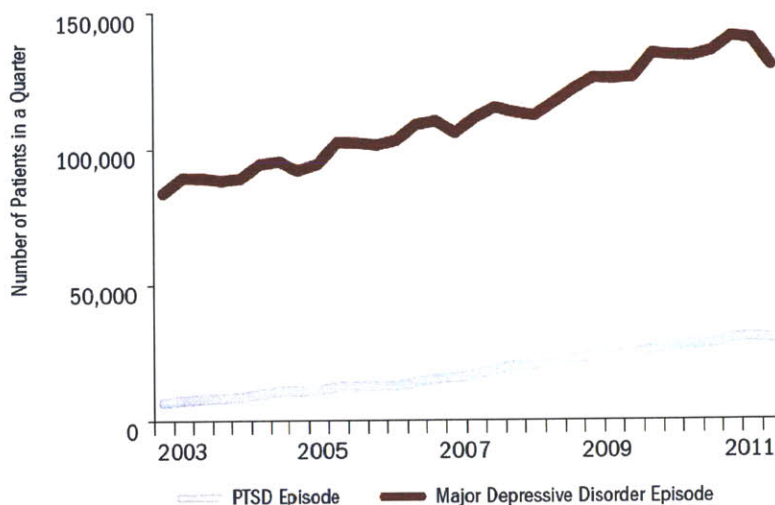


Figure 16: Current State of Army TBH in Rogers Curve (Note: Adapted from Rogers, 2003. Blue represents the groups of consumers adopting the new technology and the market share of the technology is depicted in yellow. Originally presented by Dr. Colleen Rye, June 2012)

### External TBH Ecosystem

Since October 2001, approximately 2 million U.S. troops have been deployed as part of Operation Enduring Freedom (OEF; Afghanistan) and Operation Iraqi Freedom (OIF; Iraq) with over 800,000 service member facing multiple deployments (Military Health System, 2012). The current pace of deployments is unprecedented in the history of the all-volunteer force (Belasco & Bruner, 2007 & 2006). In addition, the length of the deployments in OEF and OIF has been longer, redeployments have been more frequent, and breaks between deployments have been shorter (Hosek et al, 2006). Developments in medical technology and body armor are allowing more service members to survive – the casualty rates of killed or wounded are lower than in previous wars, such as Vietnam and Korea (Regan, 2004; Warden, 2006). More service members are surviving war experiences that would have led to death in previous wars, resulting in the further emergence of “invisible wounds”, such as mental health conditions and cognitive disorders. The three major disorders of the wars cited in a 2008 Rand report are Post Traumatic Stress Disorder (PTSD), Major Depression Disorder (MDD), and Mild Traumatic Brain Injury (mTBI) (Tanelian and Jaycox, 2008). Since the beginning of OEF and OIF almost a decade

ago, the demand for psychological health services has consistently increased. Based on the ICD-9 codes of 2011 Defense Medical Surveillance System data, 8.2% of armed forces are faced with mental health conditions (Military Health System, 2012). Additionally, close to 18,000 service members who deployed in OEF/OIF have been diagnosed with PTSD. In 2009, the number of hospitalizations for active duty service members for psychological health disorders exceeded the number of injuries (about 15,000 hospitalizations). Also it was found that 40% of combat veterans suffer from psychological and neurological illnesses (National Council on Disability, 2008). Figure 17 below highlights the MHS prevalence of diagnosed depression and PTSD in adult beneficiaries (Department of Defense MHS Stakeholder Report, 2012). The report specifically states “the MHS has had to adapt to a rise in depression and other mental illness that may be related to the effects of ten years of war...Over the past six years the diagnosis of depression and PTSD has increased by nearly 100% in the total MHS beneficiary population.”



**Figure 17: MHS Prevalence of Diagnosed Depression and PTSD in Adult Beneficiaries**  
 (Source: Department of Defense MHS Stakeholder Report, 2012)

In addition, the pace of redeployments has a dramatic impact on the frequency and availability of services for service members and their families as depicted in Figure 18 below. Therefore, telehealth presents a great opportunity to further extend services to service members and their families to help meet this increasing demand. Because one provider is needed for each telehealth encounter, telehealth may or may not help with a national provider shortage, but is beneficial with helping to improve access to care, surge support, and certain regional scenarios (i.e. regional specialty care shortages). Several stakeholders did feel that telehealth could be on



solution to help alleviate the provide shortage. They argued that if you need less than a full FTE at various locations, hiring an FTE at one location and using them part-time at another via TBH would improve shortages. To further understand the specific needs of the various enterprise stakeholders and the role of telehealth to meet these needs, we have outlined the major stakeholder groups below to also provide context for the report.

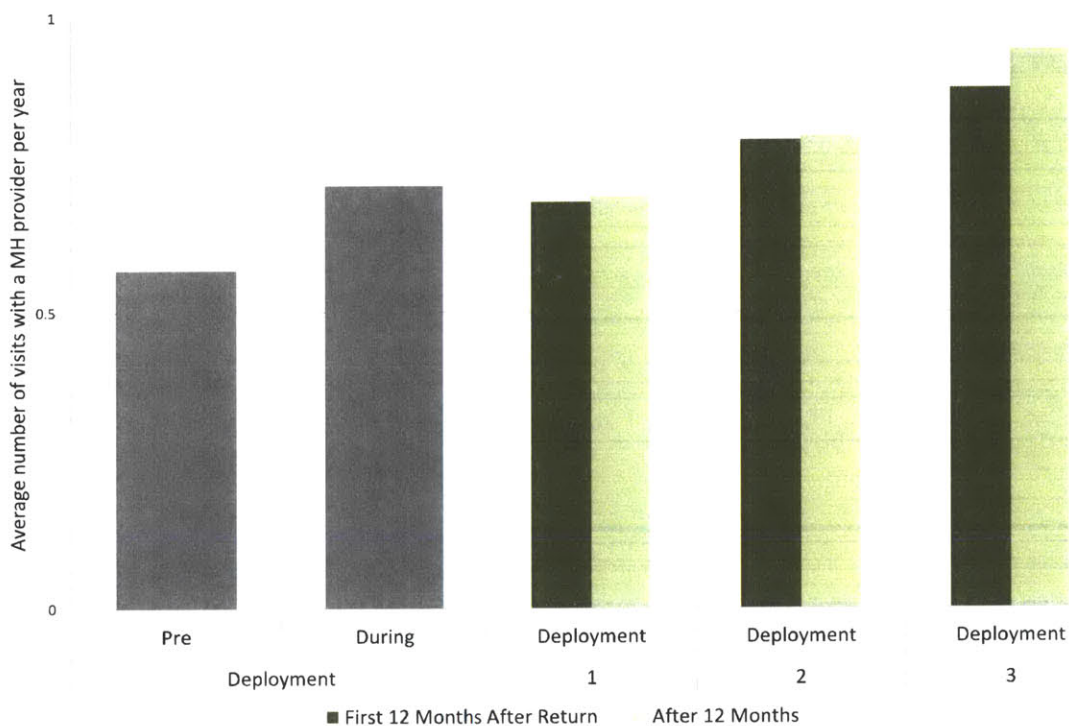
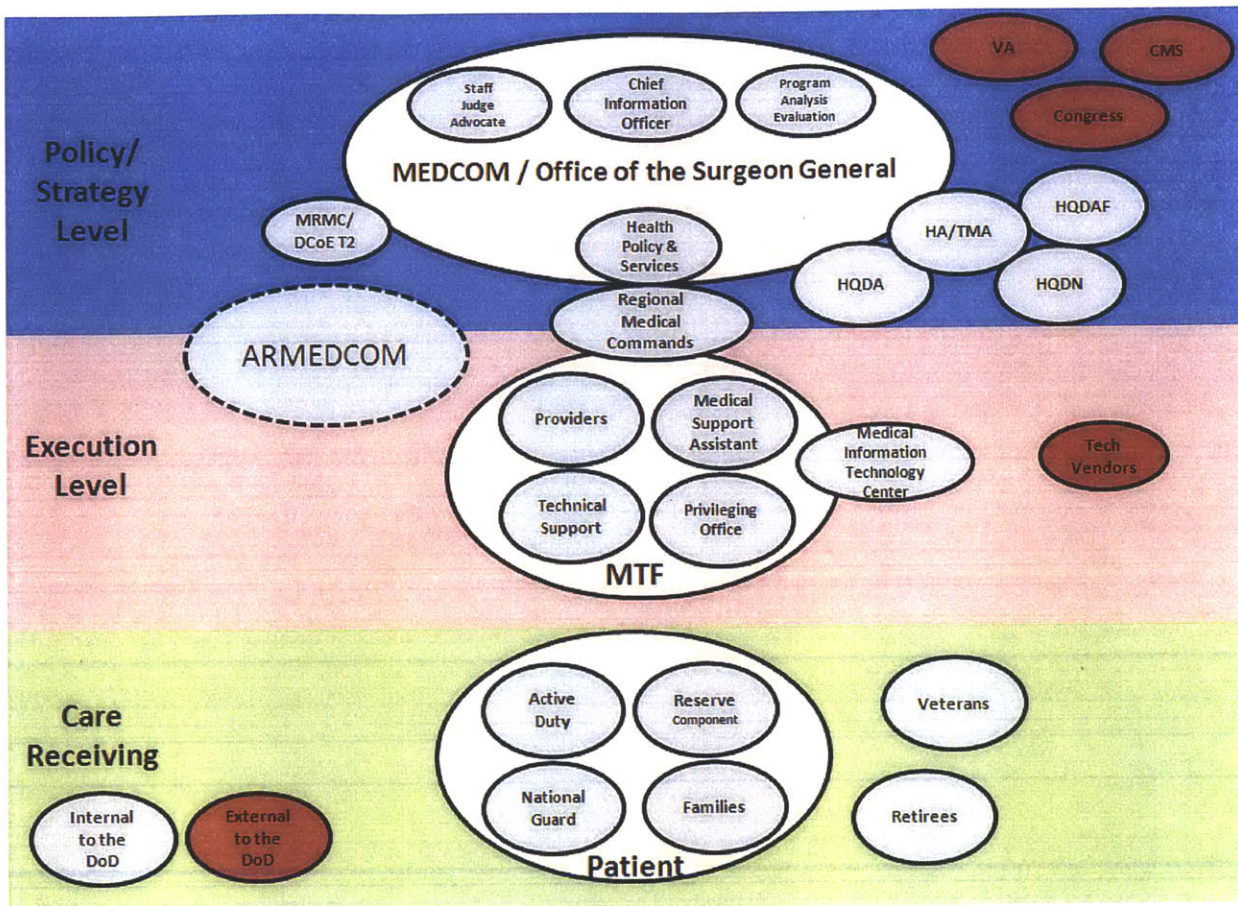


Figure 18: Care Seeking by Dependents of Active Duty Soldiers (Source: Hess, 2012)

## Stakeholders

To effectively evaluate the current state of TBH care in the MHS, we took a closer look at the enterprise stakeholders and their specific values across the behavioral health systems of care. Stakeholders are defined as, “any group or individual that can affect or that is affected by the achievement of the enterprise’s objectives” (Nightingale and Srinivasan, 2011). Within the TBH enterprise, we identified three main internal stakeholder groups, which are highlighted in Figure 19 below, policy and strategy level stakeholders, execution level stakeholders, and care receiving stakeholders.



**Figure 19: Army TBH Stakeholders**

(Note: ARMEDCOM = Army Reserve Medical Command, MRMC = Materiel Research Medical Command, HA/TMA = Health Affairs/TRICARE Management Agency, HQDA or N or AF = Headquarters Department of Army or Navy or Air Force, VA = Veteran’s Administration)

### **Policy/Strategy Level Stakeholders**

Stakeholders at the policy/strategy level include, but are not limited to, the offices of the Chief Information Officer, Health Policy & Services, United States Army Medical Information Technology Center (USAMITC), Program Analysis and Evaluation, and Staff Judge Advocate. Several common concerns were addressed by their stakeholder groups. One challenge that was expressed was developing systems and implementing requirements that translate across all regions. For instance, a stakeholder highlighted that each of the five regional medical commands are locally managed and there are often repetitive efforts across the regions. Although it is important for each region to develop programs that are relevant and meaningful for them, there are some similarities that could get consolidated and crafted into an enterprise

solution. In addition, USAMITC is part of the AMEDD organization, but they are critical in the execution of telehealth care.

### ***Execution Level Stakeholders***

The execution level stakeholders consist of the Regional Medical Commands (RMC), telehealth leads, providers, support staff (medical support assistants, program managers, coordinators, technical support, analysts, and administrative assistants), and credentialing/privileging staff within each of the regional medical commands. Also we have included the reserve component and national guard execution stakeholders within this stakeholder group as well.

### ***Army Regional Medical Commands Execution Stakeholders***

Telehealth enterprise is further broken down by the five Army Regional Medical Commands (RMCs): Northern Regional Medical Command, European Regional Medical Command, Southern Regional Medical Command, Western Regional Medical Command, and Pacific Regional Medical Command. The architecture of each of these regional medical commands (RMCs) is further outlined below in Table 4 and Figure 20. Although they face similar opportunities and challenges, it is important to characterize each region separately because they have unique needs. As one interviewee stated “I could go location to location and there is an issue. The architecture – every place is different. There is clinical, technical and logistical requirements vary based on the services provided.” The specific enablers and challenges faced by each of the regions will be described later in this report. One observation made as we gathered data for Table 4 was that standard terminology for the telehealth services delivered is not being used across the enterprise, which is highlighted below and makes it difficult to accurately measure telehealth services and encounters.

Table 4: Army TBH Regional Medical Command Delivery Architectures

	<b>Region 1</b>	<b>Region 2</b>	<b>Region 3</b>	<b>Region 4</b>	<b>Region 5</b>
Delivery Architecture	Modified Hub & Spoke	Distributed	Hub & Spoke (2 hubs: 1 large, 1 small)	Hub & Spoke	Hub & Spoke
2011 TBH/Total Telehealth Encounters	24,838 encounters (18,788 TBH)	1,088 encounters (524 TBH)	6,117 encounters (3,947 TBH)	5,326 encounters (5,052 TBH)	4,961 encounters (2,959 TBH)
TBH Services	Medication Management, Psychotherapy, Psychological Assessments, Neuropsychological Assessments, Group Therapy, Psychoeducation, SRP/rSRP BH Screenings, Patient Triage, Fitness for Duty, TDRL, MEB, Occupational Health Evaluations, Security Evaluations, Child & Adolescent Services, resiliency, disability evaluations, military readiness, forensics and security, and tele-addictions (pending).	TBH, Rehab Psych, Reintegration, VBH @ rSRP, BH/Warrior Transition Unit, PTSD Evolution	MEB/IDES Evals; Administrative separations, special assignments/school evaluations, medication management, individual therapy, TDRLs, sanity boards, child & adolescent, deployment cycle related evaluations (rSRP, PDHRA)	Tele-SRP, Tele-PDHRA, Tele-MEB, Medication Management, BH Consults, Tele-Therapy, Tele-SELF, Chapter Screening, TDRL, Tele-Psych, Tele-Psych Testing, Neuro-psych Evaluations and follow-ups, Tele-NARSUM, Tele-Discussion Pilot.	Tele-MEB, Other TBH Admin Eval, Patient & Family TH Session, Tele-R/SRP & PDHRA, TBH Adult/Child & Adol) Med Mgmt & Treatment, Psycho-education.
Sites	16	20	14	13	11

Technological Infrastructure	Unknown	23 Polycom HDX 9000 Practitioner Cart, 1 Polycom HDX 8000, 20 Polycom HDX 4000 Provider Desktop, 5 Polycom HDX 4000 for SRP, 23 AMD 400s Systems, 60 Polycom CMA Desktop, 30 Tandberg MOVI, and 5 relocatable booths.	127 Tandberg 1700, 22 Tandberg 3000, and 6 Tandberg 6000. 452 Tandberg Jabber HD cameras.	65 total VTC systems in the TH inventory: 50 Tandberg 1700, 13 Tandberg 6000, 1 Tandberg 3000, 1 Tandberg Edge 95, and 550 MOVIs.	23 Tandberg VTC units. MOVI deployment is currently delayed.
Telehealth Personnel	91	9	29	12	30

A graphical map of the five regional medical commands and their associated telehealth hubs and spoke locations is depicted in Figure 20 below.

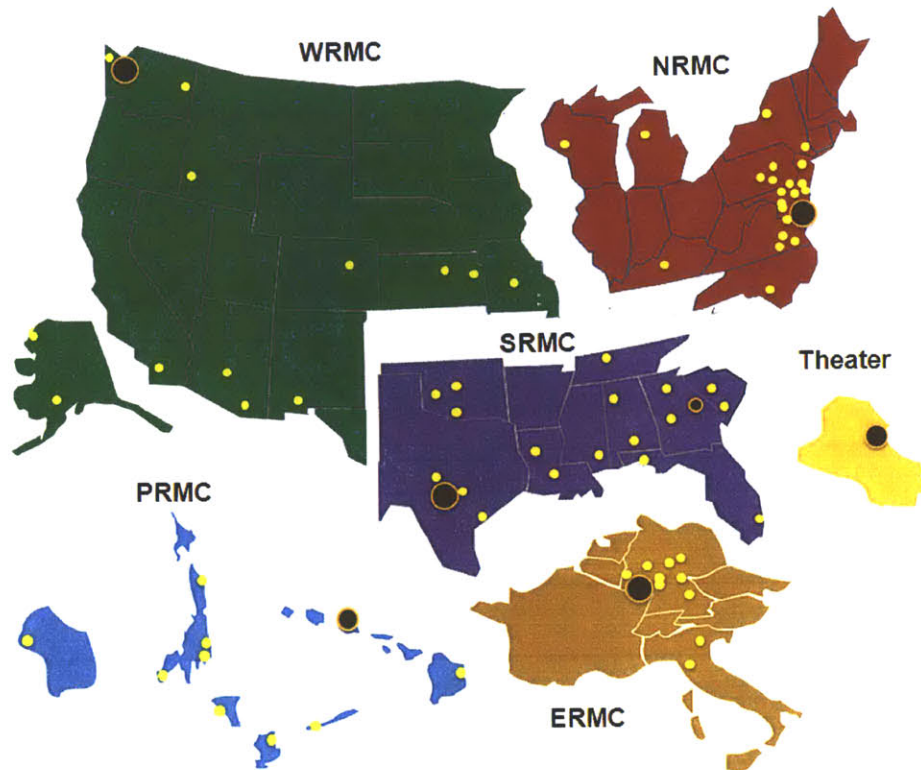


Figure 20: Regional Medical Command Hub and Spoke Architectures (Note: Black Dot is the region’s hub and the yellow dots are spoke or satellite telehealth locations)

### *Reserve Component and National Guard Execution Stakeholders*

Along with active duty stakeholders, it is also critical to address the specific needs of the Reserve Component (RC) and National Guard (NG) who are in the process of developing telehealth capabilities to meet the needs of their population. During their period of eligibility, RC and NG are able to access care via TBH at all of the sites, just as an active duty service member can receive services. However, many RC and NG service members do not live near MTFs and the Army Reserve Medical Command (AR-MEDCOM) has no dedicated resources, policies, or personnel devoted to telehealth as stated by one RC stakeholder. They stated that “TBH is a brave new frontier for us. We have not even begun exploration of it.” In addition, the NG has yet to engage in many TBH services. One NG stakeholder stated “very little telehealth is used in the NG because of all of these restrictions. If it is a state owned facility, the provider in the MTF may not be licensed in that state. So most of interactions and screenings with a provider from the guard are done by person to person organic to the state. Since we don’t

provide care, any care is done in a local facility by a civilian. In the state local armory, there is a great potential to use telehealth. The law prevents us from delivering care – Title 32 – we can't deliver care. Let's say a soldier is injured during AD and is receiving care in the community and they want to transfer to MTFs due to cost. If it was a 5 hour drive to nearest MTF, we can't take advantage of this due to restriction with licensure. The kid may be in the same state as the MTF, but the provider might not be in the same state." An exception to this policy the interviewee discusses was made for one region conduct TBH at NG facilities with their region. However, this exception has even been delayed because the NG and Reserves not having equipment and connectivity at their facilities. In addition, the RC needs to think strategically about the specific locations they would establish telehealth facilities.

### *Care Receiving Stakeholders*

Overall, a study at one Army medical center demonstrated that patients are satisfied with telehealth encounters and rate it similar to face encounters (Folen et al, 2010). This was also confirmed across the Army telehealth enterprise based on patient and provider satisfaction surveys (although patient and provider satisfaction is not measured consistently across the enterprise, but measured and implemented individually by many of the regional medical commands). For instance, one region recently measured patient satisfaction and found a 4.62/5.0 patient satisfaction rating and 85.7% of patients said they would utilize VTC again. Providers attribute this high satisfaction level to the new generation of soldiers who are more accustomed to interaction using many modes of communication. Furthermore, a BCT commander expressed the important role that telehealth played in expediting care to one of his service members, "our doctor in our battalion was unable to give him a referral. He set him up over VTC with someone at Sam Houston. It fast tracked him to the treatment. The treatment helped too. He had marital problems, multiple deployments. It came down to the guy at Fort Sam Houston referring. The VTC made it happen." Additionally, providers have noticed that patients have demonstrated a proclivity to disclose more information over a VTC. Despite this, some patients expressed concerns over telehealth, citing the lack of personal interaction and privacy of communication as their main sources of frustration. Finally, service members

expressed that they genuinely appreciated telehealth but they wanted to have a relationship with the provider before beginning telehealth. This observation was substantiated numerous times throughout our research.

Reserve component service members face particular challenges with receiving care that correlate to eligibility for telehealth treatment. Along with challenges accessing care due to distance from MTFs, the reserve component may or may not be eligible for care depending on their TRICARE options and their activation status. As one of reserve component service member stated, “I am technically title 32, but I am paid from the reserve pie. On the weekend, I am entitled to the benefits of an active duty. Very confusing. I may not be signed up for TRICARE reserve select though because I am not active duty on the week and I am not in the system.” TRICARE does have a separate telemental health network in which they can reimburse for care. However, they have recently shutdown their preclinical TBH program, TRICARE Assistance Program (TRIAP), due to lack of use. Overall, one reserve component leader stated “we need to identify the populations that are ghost populations that would benefit for telehealth services: reservists, reservist families (who are remote from any DoD installation). This is a group of people that would benefit that from telehealth. We have missed this population - a ghost population – thousands of people. There are several legal obstacles to deliver services to them in more rural settings. It is going to be a while before we work through the wrinkles to make sure providers liability is addressed with this population.” Throughout the research, providers continuously focused on the need to figure out reimbursement to incentivize telehealth adoption as a care modality.

To further analyze the telebehavioral system across the Army, we will further breakdown the enterprise using six different views as defined by Nightingale and Rhodes to evaluate the current state of TBH delivery, which includes enterprise strategy, services, process, infrastructure, organization, and knowledge. These views or lenses offer a perspective on the enterprise that help us isolate unique areas of focus, reduce complexity to help us understand the whole enterprise, and help provide unique perspectives to address the enterprise’s diverse stakeholders.



## Strategy

Several, but not all, of the telehealth stakeholders expressed a specific mission and vision for their respective organizations for telehealth. In particular, most of the telehealth chiefs and leaders within each of the RMCs expressed specific missions, visions, and goals for their region that included the following:

- “Maximize the existing Tele-Health resources to support their mission”
- “Implement a responsive and fully integrated telehealth program that operates as a routine component of the region health care delivery system.”
- “Getting 24/7 coverage for service members in the region”
- “Improving quality, cost effectiveness, and coordination through the efficient use of TBH with a dual mission of plan excellence and maintaining flexibility to serve priority missions as they come up”
- “Providing BH services to remote areas or where demands are not met.”

In addition, at least two out of the five regions expressed a specific goal of “developing a TBH solution for the region and influence MEDCOM,” demonstrating their desire to drive change to grow and improve the Army telehealth enterprise as a whole. The AMEDD Telehealth Office is the principal stakeholder responsible for defining and developing a telehealth strategy and policy for the Army. They have had a particular focus on standardizing and optimizing TBH services while simultaneously allowing managers to be managers to maintain flexibility in each of the regions to meet local needs. Several of the other stakeholder groups at the policy level did not express explicit telehealth goals, but instead focused on their approach to telehealth being driven by requirements defined by the stakeholders at the execution level. For instance, one policy level stakeholders stated, “the Army is still a bit fragmented. Our goal in our office is to have overarching policy and strategy on how to layout the most plausible solutions. The process solution as well as the technology solution. I don’t think we have an overarching strategy of we would like this to happen. We don’t have this because we feel that a need starts by receiving a requirement from the community who needs to be able to accomplish BH. We are failing when we are not doing this. This is where we need help and this is what we need to

do our job better. Then our community can respond to requests based on the specific needs/requirement.”

Although it has been a fairly positive experience growing telehealth organically, telehealth has recently been met with some “growing pains.” As one provider stated “telehealth strategy - when it was a handful of people, you had consistency, agreement on where to go and what to do. Since it has proliferated and a lot of new people coming in, all coming in from their stove piped approach with their own agendas. The bigger you get, the more bureaucracy follows. There is a whole bunch of reinventing the wheel. Instead of checking with people that have been doing it.” One concern that has been expressed is non-clinicians driving strategy and creating workarounds.

### **Enterprise Level Metrics**

Enterprise level metrics are vital characteristics for evaluating the enterprise to help drive strategy and growth. Specifically, the AMEDD Telehealth Office creates monthly and annual reports with encounter volume and no-show rates. In addition, these reports demonstrate the volume of telehealth encounters at each facility. As stated previously, patient and providers satisfaction surveys are the only other metrics being used to characterize the enterprise. Although they are not consistent across all sites, they do indicate the value of telehealth across the enterprise. One challenge of measuring TBH across the enterprise is how to quantify the difference between telehealth vs. conventional BH. Providers across the enterprise communicated the importance of creating consistent metrics across the enterprise. A failure to do so, in their opinion, would result in even more sub specialty specific metrics that only are not understand across MHS. Despite this, several providers expressed the importance of metrics that demonstrate the value of telehealth explicitly. They stated that “[There is a need for rudimentary metrics for telehealth which could include somehow measuring if we didn’t have telehealth and we only had face to face, travel time and costs, hours away from job, access to care, cost avoidance. We need to show the ROI. We need to take a holistic approach to this. The aggregate saving of healthcare costs.”

## Policy

Overall policies, manuals, and other artifacts surrounding TBH exist at the Congressional, DoD, Army, and MEDCOM levels. One unique challenge of the TBH (and the telehealth enterprise overall) is that policies evolve out of cycle with changes in technology. The following section outlines specific recent policies impacting telehealth delivery of care. In addition, many TBH providers felt that policies were in a constant state of change and were frustrated because it is hard to remain in compliance with the continuously updated policies. For instance, one provider stated “they changed the policy on who is authorized to do the screenings. It used to be that 68 x-rays did them and then referred to BH. In FRAGO 7, they said 68 x-rays will no longer be allowed to do. Policy comes out and you have to make the changes. It is not easy to do with staffing and work flow. This will come down from MEDCOM and then to people like the telehealth chief need to make them operational. The SOPs are in constant update.” In addition, it was raised that policy does not often meet the “leading edge” because of the delay associated with policy being interpreted within the government and DoD. Figure 21 addresses the flow of policy interpretation through the relevant stakeholders and highlights some specific concerns and challenges associated with it.

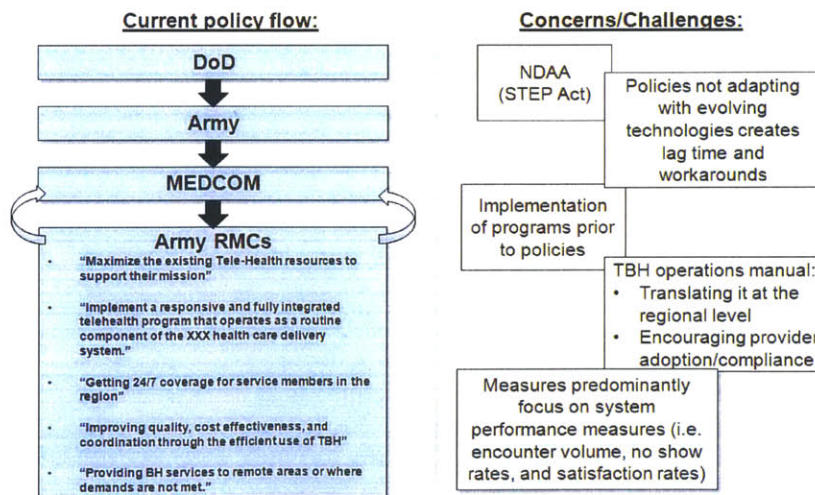


Figure 21: Current Policy Flow within the Army TBH Enterprise

The sections that follow discuss some opportunities and challenges with Congressional, DoD, MHS, Army, and MEDCOM policy.

### ***Congressional Policy***

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One particular congressional policy that received attention from telehealth stakeholders is the 2012 National Defense Authorization Act (NDAA). This policy includes language commonly known as the STEP Act (Service Member Telemedicine and E-Health Portability Act). It will “allow certain providers to practice at any location with one license. Execution of the STEP Act will enable the MEDCOM to expand TH in garrison. In particular, it will enable patients and providers to engage in care on and off federal property, expanding care to Soldiers that are geographically separated. It also may help the MEDCOM recruit in specialties where there are provider shortages by allowing clinicians to provide care from home and from geographic areas where there is a surplus of clinicians.” The STEP Act is addressing licensure concerns surrounding providing telehealth services and many feel that this is a great opportunity to extend services to the RC. One provider acknowledged the benefits of this program and enumerated many potential advantages, including: providing more services to the reserve and guard or utilized by service members or subcontractors getting ready to deploy. Despite this, several disadvantages were expressed about the STEP Act, primarily surrounding how to interpret the act and also how long it will take to translate it into practice because it needs to be first defined at the DoD level, then Army, and finally to AMEDD. Overall, providers expressed that the STEP act is not specific enough and that they understand the intent of the policy, but do not know how it specifically translates to them. This sentiment was recently corroborated in the STEP Act information paper released in May 2012, “MEDCOM is preparing for TH expansion under the STEP Act but cannot execute until DoD, Army, and MEDCOM guidance is in place.”

### ***DoD, Army, MHS, and MEDCOM Policy***

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Army delivers 97% of all telehealth encounters within the DoD and, therefore, will most likely be the focus of the DoD policy in this section. In particular, the AMEDD Telehealth Office has taken the lead of developing a telebehavioral health operations manual (also known as CBHSOC-CP TBHWG SOP) as part of the Behavioral Health Campaign Plan, which will most likely be refined for other specialties in the future. In addition, providers overall were satisfied with the manual because it was generic enough to give the providers flexibility to execute the policy based on local needs. One provider stated “the manual allowed for flexibility across the

enterprise, which was revered by several providers...they didn't make the manual too prescriptive so each region could make it into their own SOP." In fact, the manual was echoed on numerous occasions by various providers as a way to play a role in telehealth evolution to craft policy based on piloting it across the enterprise. One provider stated "we have to adapt it to our practice and culture. It is almost like being a lawyer – we know that the standard is no standard... We get to be on the leading edge of implementing new changes and solutions to problems. We are actually getting to be a part of the long term solution to these problems and implementing suggestions to the field. We are getting to be in the position to develop these things. These evolving orders. We can try things out and provide feedback." Finally, another provider stated "We have been doing this for 10 years. We have our SOP that we share, but at the end of the day the specs change from location to location where you can't change the infrastructure. We have to adapt their infrastructure and adapt it to do it appropriately."

In addition to the TBH manual released recently, the AMEDD Telehealth Office completed updates to OTSG-MEDCOM Policy Memo 11-005, "Use of TH in AMEDD TDA Facilities" in Feb 2011. In addition, the AMEDD Telehealth Office obtained clarity on licensure via use case scenarios, worked with JAG and QMD to obtain clarity on policies for the provision of telehealth to the home, informed consent, emergency management requirements, VA cross state licensure, credentialing and privileging, use of residents, malpractice coverage under different use cases, training, and Joint Commission requirements.

## ***Organization***

Telehealth care delivery is broken up by the five regional medical commands discussed in the execution level stakeholder section and are also depicted below in Figure 22.

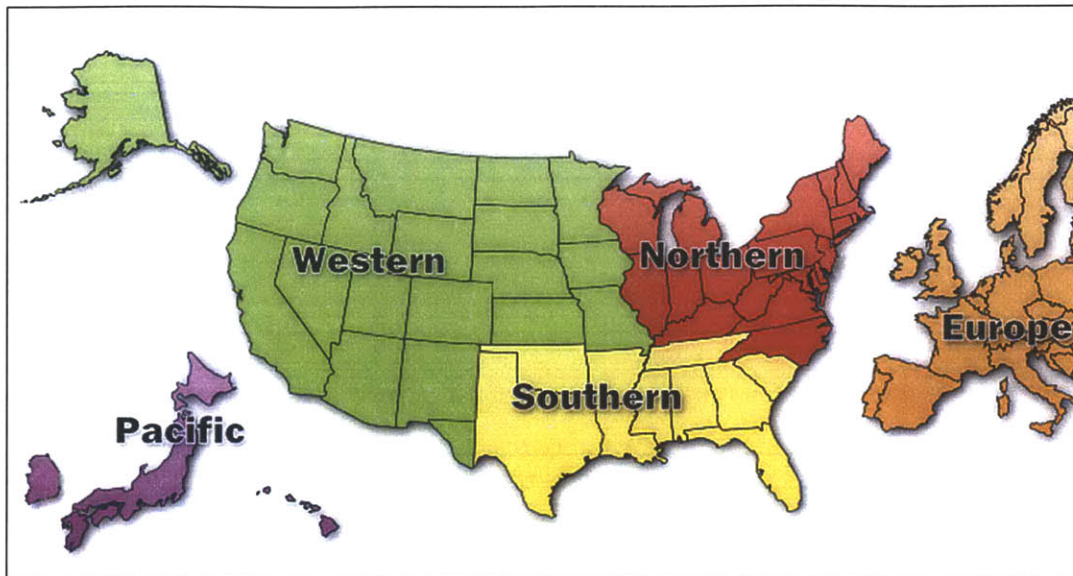


Figure 22: Five US Army Regional Medical Commands  
(Source: <http://www.armymedicine.army.mil/hc/mtfs.html>)

Each of the regions (with the exception of one region, which is smaller than the other regions and therefore operates in a more distributed model) operate in a hub and spoke model with the hub co-located at each of the respective RMC headquarters providing services to satellite clinics across their RMC. Several of the regions provide services outside of their respective RMCs (in particular NRMC which provides the most encounters of the RMCs). However there are several infrastructure challenges, such as scheduling, access to other CHCS platforms, privileging at other sites (which will be discussed further in the following sections) that often make it difficult for telehealth providers to provide services across regions (and frankly across facilities). This prevents telehealth from moving towards a more distributed model, which, depending on further work, could be an interesting model to better match demand of behavioral health services. For instance, one stakeholder stated “I am intrigued by the distributed concept vs. hub & spoke. You have to be agile and remove overhead. If you can figure out an agile way to turn a lost appointment into an appointment at another site, it could save overhead costs. The distributed capacity has a parallel in healthcare from call centers. Distributors have a ton of potential that the doctor has an agile scheduling system and has the infrastructure to support it.” For the purpose of this report, we have further broken down organization into governance and human capital.

## **Governance**

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There are three primary levels of governance within the telehealth enterprise: 1) Congressional/DoD level governance 2) AMEDD/MEDCOM level governance (as depicted in the policy level stakeholder chart), and 3) Regional Telehealth governance (who are also often telehealth providers themselves). One major challenge expressed by stakeholders at the execution level regarding telehealth governance is that there is not enough clinical perspective in leadership. For instance, one provider stated “Clinicians are in the trenches. Senior leaders mention something and then it rolls into policy and it brings everything to a screeching halt. We need to involve more clinicians in the decision and policy making process.” Specifically, providers expressed frustration at the governance level over misunderstandings surrounding telehealth modalities. One provider commented that “one challenge is higher level leadership’s perception of tele-treatment vs. tele-screening. People have different views on it in leadership in comparison to the service level.” Finally, telehealth providers are concerned that telehealth will become a separate organizational silo and that it needs to be integrated within “traditional care delivery.”

Another aspect of governance is the funding of telehealth system. As one stakeholder stated “they funded telehealth cells with the PH/TBH money managed by MRMC/TATRC and started to take something that was a real cottage industry and used this funding to take it to the next level. In 2008, you really started to see telehealth take off because the choice was made to give commanders people. Originally, they wanted to give commanders money and they said I don’t want it. They wanted people. People they could use...They were now in a place where pilot programs can pop up here in there and the AMEDD Telehealth Office was setup to coordinate telehealth care delivery.” Therefore, one lesson learned regarding funding telehealth is the importance of funding telehealth providers and administrative staff -- not just funding telehealth infrastructure.

## **Human Capital**

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Throughout most interviews with telehealth providers, they expressed the importance of engaging the appropriate level of human capital to execute telehealth encounters beyond the telehealth provider. They expressed the need for the clinical and administrative staff, such

as Medical Support Assistants (MSAs) to schedule appointments and books rooms and technical staff to help troubleshoot and setup connections. Many providers substantiated this point and strongly commented on the criticality of operations and administrative staff required to coordinate the whole TBH process. The operations staff and support staff varies based on the site need, which was viewed as a positive aspect of the current system. One provider stated that the “support staff varies on the patient end, which is good because it allows flexibility and you can tailor based on the site depending on the patient load.” Another stakeholder stated that there is “no formula for human capital in each region – every region is different – each region will tailor the human capital to their needs. Some regions have the organic skillsets built in. It is based on the need of that clinic with the region. It is helpful to have program manager, IT specialists, and a clinical coordinator. It will vary based on the clinical need. It will take a while to get inculcated. Saying you have to have X providers at X site – this was an archaic, draconian policy. This is not smart. It is not based on logic. Other regions say that they have 25% being seen by virtual BH. This makes sense. The part about saying you need X number of providers – this does not make any sense.” Another region expressed concerns of maintaining TBH manpower stability and trouble with personnel recruiting.

One challenge with support staff being on both ends is that it requires more overhead than face to face, which, in theory, increases personnel costs. However, many feel that these costs could “earned back” because there could be better utilization of providers across the system utilizing the appropriate information systems and infrastructure. For instance, one telehealth chief felt that “there are enough providers. You just need to move them around and make sure they are available when needed...The problem is scheduling and visibility of providers to deliver TBH services. The organization of the people – we have done this regionally. Usually there is a TBH cell. If we had the scheduling capability worldwide, then we could take advantage of the different time zones.” Other providers expressed similar interests and were not overly concerned with licensing and privileging challenges. They reiterated the importance of establishing an enterprise-wide patient registration and scheduling system across the RMCs, reconfiguring systems to support TBH for the right patient cohorts.. In addition, contractors were viewed as one major way to deal with fluctuations with personnel.



In addition, one specific challenge facing the Reserve Component and National Guard is that BH assets are not standard. Therefore, this might be an opportunity for telehealth to play a significant role.

Finally, adoption by providers and other staff was documented as a challenge across the enterprise. One provider stated “acceptance involves iteration. You need to overcome inertia of getting it setup. Once they become comfortable with it and know clerical staff tasks, they transition from reluctance to acceptance. Eventually they discover that TBH is easy, quality is high, documentation is clear, and clerical staff does most of it. Their workload gets shifted so they can focus on acute cases in their own facilities and TBH helps see people more urgently.” In addition, another telehealth regional medical command chief stated that providers are often the ones who are resistant to telehealth not the soldiers (soldiers are used to video games). However, once providers use it, they enjoy the experience. Providers seemed intimidated at first by the technology, but when the technology is successful, the encounter is successful.

### *Processes*

Overall, there are three main types of telehealth enterprise processes: policy development and deployment processes, infrastructure development processes, and care delivery processes. These processes, especially associated with care delivery processes, vary across the sites, which overall is a positive attribute of the system because it allows for flexibility based on different sites’ needs. However, it can become difficult for providers who work across several sites because there is variability across locations that can be hard to adapt to and keep track of. For instance, one provider stated that “telehealth is augmenting at each site and it needs to be seamless or interwoven or else you are competing with everything – bandwidth, space, and infrastructure..” As TBH (and telehealth overall) continues to grow across the enterprise, there is a strong need to practice standardized clinical, administrative, and technical processes, but still attempt to meet the local needs of individual facilities. Many of these standard processes are developed in the operations manual and one challenge currently facing the enterprises is stakeholder compliance to the manual.

### ***Policy Development and Deployment Processes***

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The focus of this report is to primarily discuss the care delivery processes, but one challenge to note surrounding policy creation processes is the long periods of time that are required to generate, interpret, and implement policy across the enterprise. For instance, the STEP ACT as a congressional policy is projected to take at least a year at the DoD level, a year at the Army level, and 2-3 months at the MEDCOM/AMEDD level. This is important to note because the telehealth enterprise is constantly evolving, so it is critical to design policy that is flexible to meet the changing needs of the enterprise. At the AMEDD/MEDCOM level, there have been several examples of policies moving through their office in ten weeks, but other policies may take closer to a year often because the policies are new and there was little legal precedent in the military. This often results in Army JAG speaking with civilian attorneys and other subject matter experts, but ultimately it takes some time because although policy is necessary to keep up with new technological developments, case law is actually based on historical examples and new technologies and systems do not have precedence. In addition, if a change needs to be made to an Army Regulation, the timeline is extended even longer. For example, this is currently taking place with AR 40-66.

### ***Infrastructure Development Processes***

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Overall, some stakeholders expressed frustrations about 1) translating requirements for telehealth infrastructure across the enterprise and 2) providers not utilizing U.S. Army Medical Information Technology Center (USAMITC) to properly setup infrastructure. One stakeholder stated that “we have five regions – each region has a telehealth management role and they are conducting telehealth, various specialties, as needed and as required and needed in the region. It is locally managed, governed, and decided. Some of the failures involve lots of repetitive efforts...there are too many similarities that could get consolidated and craft an enterprise solution.” In addition, one stakeholder stated that sometimes providers try to bypass the centralized USAMITC team, which has created interoperability problems in the past.

### ***Care Delivery Processes***

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Overall, most RMCs follow a similar care delivery process surrounding telehealth encounters, which is depicted below in Figure 23. The actual care encounter is conducted in the

same manner as a face to face session with the exception of introducing the patient to telehealth. Despite this, some of the process steps vary across the enterprise. Some examples of these variations include setting up the video connection and other information systems, scheduling patients, providers, and equipment across different facilities (for example: different sites have implemented homegrown sites to schedule equipment), variations on the staff at either end (mainly with regard to the support staff, such as patient presenters, coordinators, and MSAs), and the administration of patient satisfaction surveys at the end of the encounter. These variations across the enterprise are not necessarily negative because each site has local needs.

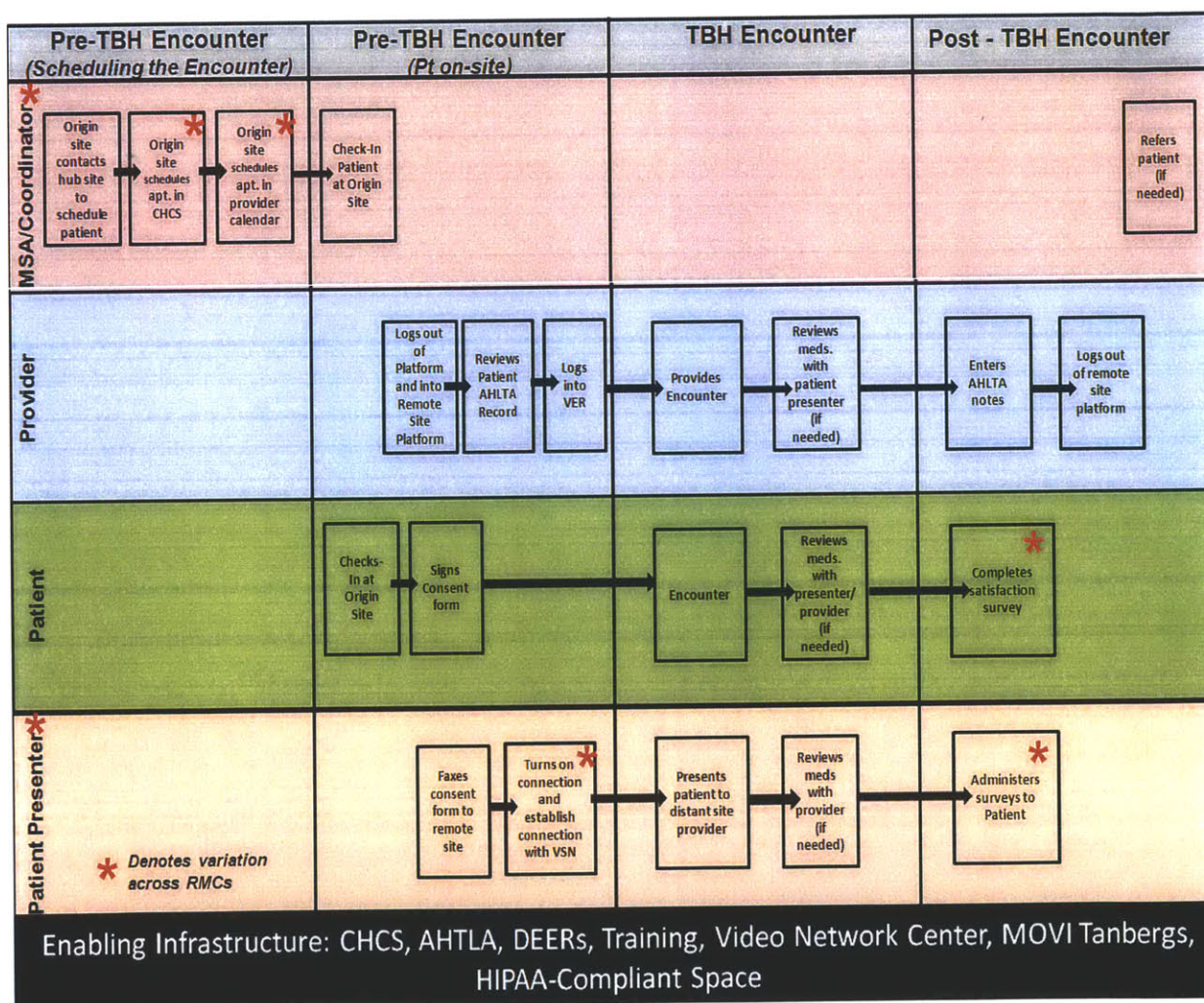


Figure 23: Care Delivery Process Map Generalized Across all RMCs (Note: Red Asterisk denotes variations across the sites)

The RC and NG are able to access any of the TBH services in the traditional processes noted above as long as they are in a status that makes them eligible for care. These processes would not be different than for an active duty service member, except potentially for setting up sites at RC armories, which is currently allowed, or at NG facilities, which is allowed in some cases. In addition, TRICARE has sub-clinical TBH work, but currently TRICARE does not cover TBH. Often times, the RC and NG do not know they have access to these services and educational efforts perhaps could be useful in marketing these services.

## *Services*

### *Encounter Overview*

Based on our interviews, we have found that 70% of telehealth encounters are BH in nature, and TBH has grown by roughly 60% in recent years (varies slightly around 60% each year with a 246% growth in encounter volume since January 2010). In particular, TBH includes medication management, psychotherapy, assessments, resiliency, disability evaluations (MEBs), military readiness, forensics and security, child & family services, Soldier Readiness Processing (SRP) and Reverse Soldier Readiness Processing (RSRP) evaluations, psychiatry (adult and child & adolescent), social services, case management, and Warrior Transition Battalion services. However, this list of services is not standardized across the enterprise. Surge cells have also been stood up to help provide services during high demand of service member deployment and redeployment processing. In addition, TBH theater initiatives have been deployed in Afghanistan, Kuwait, and Iraq (no longer operational). With the success and growth of TBH in recent years, this has brought new challenges as TBH continues to scale across the enterprise, which is highlighted by other sections in this report.

### *Value Provided by Services*

As stated earlier, the value of TBH services was clearly outlined across numerous interviews. Telehealth provides support on more routine services (i.e. screenings, assessments, administrative separations) which allows sites to focus on acute and specialty cases. Telehealth can potentially help free up provider's schedule that are overbooked and eliminates the need

for TDY, saving time and money. It can help improve access to care and no-show rates. It also provides temporary support during times of personnel shifts or deployment surges. Finally, it is often hard to hire certain specialty providers in many locations (specifically more rural settings), therefore telehealth helps provide better access to various healthcare services and specialties for different installations.

### ***Infrastructure***

The infrastructure surrounding TBH (and most telehealth encounters) includes information systems, technology, and facilities. Each of these will be described in further detail below.

### ***Information Systems***

Overall, information systems for telehealth include the Composite Health Care System (CHCS), AHLTA, CCQAS, and DEERS. These information systems were all put in place prior to much of the telehealth enterprise development, which often results in the “retrofitting” of telehealth processes to existing IT systems to make telehealth delivery possible. For example, TBH providers often find it difficult to cross CHCS platforms. As one provider stated “it takes longer to relay information because there is no common platform.” It is possible, from a technological standpoint, but often times people do not know the specific actions to take and often does not work. As one provider stated “people do cross IT platforms. I learned how to do it from a provider in another region. He showed me how to do it and he passed along to other sites.” Also locations outside of the Army network find it challenging to access the information systems. For instance, one provider stated “some of the SRP sites are in remote locations so they can’t reach back to the entire Army domain. You may have to do something else. You may need to be a little more creative how you reach these sites. This is not the larger community though.” Common IT platforms are an issue. This especially makes medication management difficult resulting in a great deal of excess use of other forms of communication technologies, such as email or faxing, which is not an accepted practice at all locations, which causes information to be lost outside of the medical record. As one provider stated, “overall there is too much faxing around and email overload. There are constant workarounds with the technology.” Providers also expressed frustration with the number of databases, which make it

difficult to track and organize information surrounding the patient. This also results in providers memorizing several passwords, which they often forget because they have to change them often. There are also concerns surrounding AHLTA latency because it often takes up to 72 hours for a patient record to populate in AHLTA. For instance if you are a provider at Tripler dialing into a patient at Wainwright, the patient must check out with a nurse afterwards or someone else who must read instructions from the provider. As a general note, patient registration and scheduling rely on CHCS, but all clinical notes are in AHLTA.

### *Scheduling System*

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Overall, the scheduling system utilized with the Army TBH system varies across the enterprise and there is a need for an enterprise-wide schedule system. One provider stated “we need a global scheduling system. They are working across regions now. Doctors that can see you in other regions, but they have no way of scheduling.” Other providers corroborated this statement by arguing for a means to do worldwide enterprise wide scheduling of telehealth encounters across different time zones. Currently, face to face and telehealth encounters utilize CHCS. However, some providers on other platforms often cannot see each other’s schedules because you cannot see schedules across CHCS platforms, and there may be many such platforms even in one region. In addition, one provider stated “CHCS is site specific. To update a patient record in AHLTA, the patient needs to be registered on the CHCS platform too, which creates duplicates. CHCS is not conducive for scheduling.” Currently, CHCS is the only way to schedule patients other than with pencil and paper. If you do the registration incorrectly, it will cause duplicates in AHLTA but if you enter information exactly as already reflected in AHLTA, it will not. This resulted in several regions developing “home grown” scheduling systems because some of the sites span across different platforms (even within one regional medical command) and they created their own internal scheduling systems to connect those sites. For instance, one region does TBH scheduling in SharePoint so they can link providers with patient and equipment. Additionally, it is important for Medical Support Assistants (MSAs) to have access to CHCS across different facilities and regions. Currently some MSAs do not have access to other facilities scheduling systems across the enterprise, which makes scheduling less efficient and more difficult across the enterprise. Also scheduling templates are developed 45 days out and

often stakeholders expressed frustrations with having to jump through hoops to provide TBH to sites where the schedules have already been developed and released for scheduling. One provider stated “workarounds occurred because leadership did not want to hold them to the 45 day limit. They developed an internal rule that if a change happens within 3 days, they would accommodate it or else, if we did hold to these rules, we wouldn’t be able to provide services to those who need it. We need flexibility with this.” A key barrier is how we build templates across platforms and administrative functions. The barriers associated with scheduling systems are also creating barriers with provider utilization. For instance, if a provider is not registered in the patient’s CHCS system (i.e. where the patient is physically located), it results in a lot of empty time on provider calendar. In particular, there are several open questions with regard to opportunities and challenges with scheduling and telehealth, which include:

- How can an enterprise wide scheduling system better integrate telehealth into the continuum of care?
- What role do telehealth providers play in the continuum of care?
- If scheduling can happen at the enterprise-wide level, how do we prevent provider burnout?
- How do we coordinate assets across CHCS platforms?

### **AHLTA**

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Real time accessing of AHLTA across platforms is a barrier across the enterprise. Currently, you are required to update AHLTA within 72 hours of an encounter, but often telehealth providers cannot gain access to the most current record in this timeframe. As one provider stated “telehealth is not an option listed in AHLTA. You have to put it in the notes. Also duplicate registrations are an issue in AHLTA.” For TBH services to grow, the TBH community needs to ensure real-time processing of AHLTA notes. Finally, there is little to no access to AHLTA for the RC. One provider stated that “the reserve has very limited access to AHLTA if any. As a BH officer, I often recommend them to go to the VET center because they are not keeping records.”

## *CCQAS*

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The Centralized Credentials Quality Assurance System (CCQAS) is a web-based, worldwide credentials, privilege management, risk management and adverse actions system for the Department of Defense Military Health System. Overall, privileging and credentialing are a great challenge across the enterprise. Specifically, privileging at each site is seen as not standardized and varies across the enterprise. One provider described the credentialing and privileging offices as “fiefdoms.” However, this is not universal across the enterprise. Specifically, one of the smaller regions does not experience the same credentialing and privileging issues, because they have only 3 offices, which makes the process relatively simple. Additionally, the credentialing and privileging renewal process does not seem to be consistent across the enterprise. In some regions, it is a 2 year period, whereas in other regions it was stated to be 1 year. The establishment of a standardized system for privileging or a standard set of privileges for telehealth providers across the enterprise would help eliminate a great deal of paperwork. Currently, there is a standard set of privileges that is not used. This would assist the providers who have to update privileges across many different sites (our research identified providers who had to update privileges at up to 10 sites). Despite this, one provider stated “it would be cool to get this standardization of privileging. It just needs to be standardized...I have to update my privileges at 10 sites each year. It is a hassle.” Regardless of what changes take place to privileging, it is critical that the standards fall within Joint Commission guidelines. In addition, one region stated that “recently, anyone who is in a “training” capacity, to include Fellows, students, new employee providers requesting supervision as they become fully competent in IDES operations, have been denied privileging for TBH at some RMCs.”

## *Accounting through MEPRS Code in AHLTA and M2*

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Several regions expressed frustrations regarding accounting of telehealth encounters. One provider stated that there is “no single MEPRS code. We have it here for the hub but there is no global MEPRS. To extract data, we have to search by provider ID because no single MEPRS code.” Another region expressed frustration with it because “providers forget to use the modifier. It is another step and coders will often change it too because they don’t understand.” In addition, a provider expressed that “accounting for services is not reliable. Information drops



out...the systems that we currently have for coding have challenges capturing telehealth extensions. I am not sure if people are not able to capture it as a telehealth encounter. We are having trouble capturing these accurately. We are only getting 40-60% hit rates on their data. This would be a fertile area to try to improve. This may be human behavior too.” One region has successfully implemented a TBH MEPRS code. They stated that the “MEPRS code did drive argument for more TBH providers because they could actually measure it. There is a lot of volume out there. We knew we needed to have a separate MEPRS code with our TBH clinic. We went round and round at MEDCOM though. Before the MEPRS code, it was hard to pull the data, not intuitive. It was hard to get providers to do consistently. We lost workload when pulling the data. GT modifier is subject to AHLTA revisions. GT modifier was in 1 place and when new AHLTA came out, we couldn’t find the GT modifier. [TBH] MEPRS code makes it accounting easier and more convenient. It is a no brainer this way. We can account properly for clinics. You can use a GT modifier but then the provider has to do it each time. With MEPRS code, you don’t have to do this...we would prefer to take it down another level for psychology and psychiatry. It has really helped to demonstrate that our clinic adds significant value.” However, other regions did not express frustrations with accounting. For instance, one region stated “inputting RVUs is just like seeing a soldier live. You do a normal AHLTA note and use a GT modifier code to account for telehealth. The IMD (Information Management Division) know how to extract the data and pull it up in the system based on codes.” To help examine this problem, BH hired a team from PAE to analyze their coding. Based on their analysis, it is currently physically impossible to follow DoD coding policies, because the last version of AHLTA dropped telehealth codes from the correct locations. They have issued a ticket to the contractor SAIC for about 18 months now and they have still not heard back. We have had a “trouble ticket” into the contractor, SAIC, for 1.5 years now, and have not heard from them yet.

### ***Technology Infrastructure***

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The main technological infrastructure associated with TBH delivery is the Jabber product, which are commonly referred to as MOVIs. There is some confusion whether the MOVIs and VTCs count as medical or IT equipment. Many providers feel that the equipment should be classified as clinical equipment, while IM/IT (USAMITC) also wants ownership of it as

IT equipment and feel that they can do a more efficient job by managing it centrally than local IT support. In addition, providers urged against massive enterprise level purchases because “it becomes a coat rack” and suggest looking at the direct needs of the sites and target equipment to those needs.

The goal of USAMITC is to make a seamless video connection anywhere to get healthcare to the soldiers. USAMITC currently believes that they have the infrastructure today to support that and believe they could support telehealth in the home today. However, some issues to consider with in-home care include AHLTA access, firewalls, and clinical process measures such as safety procedures. For instance, there is currently no randomized control trial evidence to support safety and efficacy for in-home care, though DCoE-T2 is planning a study. In addition, TRICARE does not cover in-home care. Another challenge the USAMITC organization faces is that they often are faced with deploying the status-quo technology. The stakeholder also expressed additional concerns that there needs to be more collaboration between USAMITC and providers because it is important that the right technical infrastructure is in place to ensure interoperability across the enterprise. Finally, appropriate bandwidth at facilities was a concern brought up by a few providers that is an integral component of a successful telehealth encounter. The ATA has guidance covering these suggested bandwidths and it is also covered in the TBH Operations Manual.

### **Facilities**

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The final piece of infrastructure important for a successful telehealth encounter is having adequate space for the encounters. Space was explicitly expressed as an issue in some of the regions. In addition, providers expressed concerns about blocking off specific space for telehealth because it limits the flexibility of telehealth encounters which is one of the main telehealth advantages. For instance, one provider stated “enterprise solutions are great but depend on physician space...you can’t say “this is telehealth room” when there is limited space. You could have mobile units in the hallways to create flexibility. However, this often requires wireless capabilities, which is sometimes a challenge depending on the facility.. It needs to be mobile because if you lose a room, providers can get displaced and you can lose VTC capability and you can’t work.” If there were inflexible spaces and you lost your ability to use a telehealth

room, then providers could not complete the encounter without the VTC equipment. In addition, facility planners should think about how telehealth could potentially fit in within new clinical facilities. Many providers agreed with this sentiment and argued for more telehealth forethought when constructing new medical facilities. Providers believe facility planners should ask questions like: where does telehealth fit into your structure here? How are you preparing yourself to be telehealth capable? Finally, as an opportunity for TBH in the RC, facilities with VTCs would potentially be available for NG and RC. The problem often lies with the fact that guard facilities are state-based facilities, which could create licensure concerns, though they sometimes lease space from federal. In addition, one region has had great success with relocatable buildings (RLBs). Specifically, they mentioned that where demand for BH services is expected to be stable or grow, RLB is an alternative to the space situation. The RLBs set up fast, are self-contained, and in some instances can house a number of “dual purpose” exam rooms.

### **Knowledge**

Knowledge gained through the evolution of telehealth from local needs and shared with enterprise stakeholders has been an important part of the growth and scaling of TBH. As TBH and telehealth scales and distributes further across the enterprise, it is important to develop systems or trainings to understand and evaluate patients and providers engaging in TBH encounters. For instance, one provider stated “we don’t have any online self-report questionnaire to measure patient progress...We should do some sort of validated self-assessment and convey this to the provider. They are not hard to do, but we are a ways a way from having a tool to do and understand how they are doing day to day over time.” In the near future, BH is actually rolling out a tool to help show providers how they can improve over time, which should address this provider’s concern. Within the “knowledge” lense, it is also important to understand current trainings and other knowledge sharing efforts across the enterprise.

### **Training**

AMEDD C&S in coordination with the AMEDD Telehealth Office and BHD has developed an introductory training for telehealth providers on how to “connect and communicate”. An additional training module is nearing completion; this module focuses on “policies and

procedures". Once the module is fully implemented, all telehealth providers and some staff will be trained in a standardized fashion across the MEDCOM. Most stakeholders believe this should help assuage concerns over the risk management within TBH and help dispel concerns that training is not being standardized across the enterprise. Historically, training has been developed locally at many facilities within RMCs. Our research documented many cases where TBH personnel personally developed the training. In addition, a couple of providers felt that training needs to begin in residency programs. One provider stated that "there is an art that you have to learn over time where you make good clinical decisions that you get from experience and not from a training video. You need to mandate it into residency programs. Getting mentored is the key." TBH training in DoD medical programs could perhaps help, but many providers are trained outside of the DoD system. Finally, many providers expressed frustrations though that they are not able to code for training as part of their job.

### ***Best Practice Sharing***

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Overall, telehealth chiefs discussed participating in best practice sharing over VTC, but expressed that there is further opportunity to grow best practice sharing forums. For instance, often telehealth providers not located in the RMC hubs are not as involved with the best practice sharing sessions. One TBH provider offered an anecdote of a valuable experience he had with a TBH provider in another RMC which occurred by chance. He stated "best practice sharing is very limited across the regional medical commands. It was totally random when I ran into another provider and shared our experience surrounding FRAGO 7. It was not coordinated - he just happen to be here. They do things differently. There is a leeway for those things and we were looking at each of our workflows. I tried both ways (my original way and XX provider's way). We shared these little operational gems. From this, we decided that we would speak on a regular basis. This best practice sharing would not be as good at the regional level because they all know each other." Although providers expressed an interest for more best practice sharing, there were several examples of stakeholders coming together across the enterprise to share best practices during our interviews. For instance, over 50 stakeholders from across the enterprise were involved with the development of the TBH manual and currently there are best

practice sharing meetings at the MEDCOM level that take place in a community of practice model.

### ***Enablers and Challenges across the Army RMCs***

To summarize many of the points made in the report, we wanted to compile a list of the various enablers and challenges facing the execution level of care in each of the Army Regional Medical Commands, which are summarized in Table 1 and 2 below, respectively. These enablers and challenges were explicitly expressed during our interviews.

### ***Enablers across the Army RMCs***

Throughout our interviews, we heard several accounts of what makes a successful encounter. In particular, one provider highlighted the following encounter characteristics: “patient check-ins with clerical staff, clerical staff setup connection, TBH provider verifies consent, documentation occurs in the EHR, safety processes in place, communication capability throughout the encounter, and scheduling ability.” In addition, another provider’s perspective on this same question was “you need equipment, people at both ends, informed consent, safety plan, processes to maintain confidentiality, and satisfaction surveys.” (On a side note, currently, the AMEDD telehealth office is updating the consenting policy. Specifically, they have asked the lawyers to review the need to obtain written informed consent for patients and looking at comparing practices with the civilian sector). Another perspective was “you need clinical champions to be successful, need a way to document the encounter - need to go into the EHR (AHLTA in the DoD), and we need to fix scheduling. Scheduling is done locally right now, we need to have it done globally. The folks in Tripler were looking into connecting through the cloud.”

The full list of enablers is shown in Appendix C across five regional medical commands. In summary, the top enablers of TBH mentioned across the RMCs in particular include:

- Administrative and clinical coordinators at the sites to make TBH encounters seamless
- Patient surveys as a means to tracking performance of TBH to show success
- Artifacts, such as consent forms, SOPs, and manuals, to provide guidance and comply with legal and other regulatory and accreditation requirements

- Flexibility during fluctuations in demand

### **Challenges across the Army RMCs**

The major challenges identified by each of the Army RMCs are shown in Appendix C. It should be noted that these are the challenges that were explicitly expressed by the RMCs during our interviews. In particular, the top five challenges (as determined by frequency of comment during interviews across RMCs) are the following:

- Difficulties with data quality associated with inaccurate accounting of services
- Obtaining privileges is cumbersome, inefficient, and not standardized across all facilities
- Availability of space to provide TBH services is sometimes scarce and often VTCs get tied up and not scheduled appropriately
- Scheduling is difficult across the enterprise due to challenges with getting access across platforms

### **Conclusion**

Throughout this chapter, we have highlighted various enablers and challenges facing the TBH enterprise. Most of the challenges are a product of the recent growth and success of TBH to help augment care and better meet demand of BH services across the enterprise. Providers expressed the need to further integrate telehealth into care delivery and not keep it as a separate system. For instance, one provider argued “it needs to be inculcated in the way we practice so it is not referred to as telehealth. It needs to be another modality and service within the clinic. We have patients with needs and have the ability to take care of them, so you should use telehealth.” This will be dependent on a standard appointing system with an accurate accounting method. Unfortunately, the technology needs to justify its existence perpetually, so accuracy with regard to TBH numbers is imperative. They must be tracked separately for the mean time. Another stakeholder expressed that “it will take time for telehealth to be integrated into medicine. We have to get out of the way we do business. For instance, a patient can’t get in for 4 months because you don’t have the staff to keep up with it, but sometimes they won’t give these patients away because they don’t want to lose RVUs. A cultural change is needed.” Also several stakeholders at the policy and execution level encouraged more coordination with

the VA. Some comments include that “we need to work with the VA more. VA has been doing this forever and we also end up sharing patients” and “VA and MHS are not connected This would be a tremendous advantage and give patients a choice...It would take a lot more work to setup those processes between the VA and MHS though.” They noted that it is difficult in the current state due to different architectures across the DoD and VA. One provider stated that “one challenge is working across other services and the VA and everyone has different policies, practices, and information services.” Several stakeholders commented that they are already working with the VA and have already leveraged best practices from them. One noted that they “pirated” their training directly from the VA and that “we have much less experience than the VA has.” However, they also noted that DoD has advantages because they felt that MHS has less bureaucracy than the VA.

Several enterprise stakeholders felt there was a large opportunity to grow TBH services to the NG and RC where TBH is still in its infancy. RC stakeholders felt that they first needed to “pull all the stakeholders in and get a better handle on how to work together. Bringing in TRICARE, family programs (how to utilize this better), the VA and VET centers. We have tiered system of who is eligible for what. ” Also location and access to services was an immediate concern. Many providers also argued for convenient locations with TBH capabilities for the NG and RC and noted that “one dilemma we face is finding a location to administer their initial evaluation...there needs to be an alternative, more convenient location.” Redeployment is a natural area to develop TBH capabilities and could certainly be welcomed during deployment and re-deployment. Some RC stakeholders also mentioned that telehealth could be an opportunity to engage RC families through yellow ribbon programs. One interviewee stated “How can you help me be more deployment ready? You need to look at families.” Finally, interpreting the STEP act was expressed as a means to help provide TBH services to this population.

Several stakeholders discussed the importance of maintaining a balance with being too prescriptive and establishing standards. One evaluated the current state as “if you are working with 6 different locations, you have 6 different flavors at each location...the challenge is that there is no standards. A problem with telehealth is that you are crossing lots of boundaries so

you become more aware of the lack of standards. No two places are the same.” It is a challenge to establish standards because “one size does not fit all” and providers expressed concerns about making “blanket umbrella” standards that do not make sense at all facilities. Along with balancing local needs with standards, it is important to establish a flexible system that evolves with technology change. For instance, there is a need for flexible infrastructure (“MHS was not thinking about new technology when designing this [referring to CCQAS]”) and flexible staffing (“reverse SRP often does not happen on time and often gets push backed. How can we quickly turn around slots and push to use to accommodate another site?”). Many providers and leadership expressed the importance of bottom up growth of TBH in the past years. “You need to build it from the bottom up and begin to roll up. You need to adjust the needs based on what your region needs...You start with something, when you maximize utilization, then you expand.” Several unopened questions remain surrounding if this is the appropriate strategy as TBH continues to grow and expand.

Finally, expanding the provision of TBH services available within homes remains an unanswered question. Mobile phones and body sensors with physiological monitoring are already being piloted. In particular, the mCARE program has met great success with their clinical pilot and provides an opportunity to better track and manage service members faced with BH conditions. With regard to providing therapy, providers expressed concerns surrounding patient safety with regard to decompensation of a patient in the home and issues with licensure. Another opportunity to engage in the near term is through the patient centered medical homes and developing TBH capabilities into those models. The opportunities and challenges outlined throughout this chapter will be utilized in chapter 5 as design rules and requirements as we architect the future Army TBH system of care.



## Chapter 5: Future State Analysis of Army TBH Enterprise

### Introduction

Based on our current state analysis of the Army TBH enterprise, our goal was to architect the future state architecture of the enterprise. Utilizing the seven views as a framework, we gathered data from literature reviews, site visits, two rounds of interviews, and an Army TBH workshop at MIT to generate future state “Enterprise Requirements.” We have summarized these stakeholder-generated requirements in Table 5 below. These enterprise requirements served as design principles as we constructed the future state. To ensure requirement traceability, these requirements will be referenced through this chapter with their ID label as outlined in Table 5. By leveraging a holistic systems approach, this chapter presents our vision for Army TBH enterprise moving forward. As systems engineers, we remained hyper vigilant on accounting for the various stakeholder's perspectives and are focused on recommending a future system that makes sense at all levels of the enterprise, including those at the policy/strategy level, execution level, and care-receiving level. It was critical that the architecture we presented have merit and be implementable going forward. The following sections highlight the future state architecture of the Army TBH enterprise.

Table 5: Army TBH Future State Enterprise Requirements

Enterprise Requirement ID	Definition
<b>ER 1.0</b>	<b>MEDCOM shall establish a core funding stream as a line item to support TH service line.</b>
ER1.1	MEDCOM shall establish a core funding stream for telehealth in the MEDCOM and appoint the MEDCOM Telehealth Service Line as the proponent for MEDCOM telehealth funding.
ER 1.2	MEDCOM Telehealth Service line shall build a sustainable business model for telehealth.
ER 1.3	MEDCOM Telehealth Service Line shall provide RMCs with clear policy guidance, but RMCs should be granted execution authority and autonomy to decide and manage the appropriate TH services for their region.
<b>ER 2.0</b>	<b>MEDCOM Telehealth Service line shall develop standard TBH metrics for deployment across the enterprise</b>
ER 2.1	MEDCOM Telehealth Service line shall implement BH dashboard accessible via SharePoint and ensure access of J-Med to SharePoint.
ER 2.2	MEDCOM Telehealth Service line shall develop cost avoidance metrics to help support a telehealth business model.
ER 2.3	MEDCOM Telehealth Service line shall develop a common terminology of TH services and ensure enterprise is utilizing the same nomenclature regarding the use of TH services.
<b>ER 3.0</b>	<b>MEDCOM Telehealth Service line shall identify eligible populations across the enterprise that could benefit from the expanded access that TBH services provide.</b>

ER 3.1	MEDCOM Telehealth Service line shall analyze data sources to understand the size of underserved populations and tailor TBH services based on this evaluation, establishing access points to utilize TBH.
ER 3.2	MEDCOM Telehealth Service line shall recapture and target TBH services for populations diverted to the TRICARE network during periods of high demand
<b>ER 4.0</b>	<b>MEDCOM Telehealth Service line shall develop an enterprise solution that supports seamless flow of operational information and the electronic health record.</b>
ER 4.1	MEDCOM Telehealth Service line shall develop a global scheduling platform that schedules patients, providers, space and equipment.
ER 4.2	MEDCOM Telehealth Service line shall establish GT and GQ modifier automatic “tickler” prompt in AHLTA that asks providers to distinguish telehealth encounters.
ER 4.3	MEDCOM Telehealth Service line shall standardize prescription and lab ordering processes in AHLTA across geographical locations that facilitates the seamless use of TBH/TH.
<b>ER 5.0</b>	<b>MEDCOM Telehealth Service line shall revisit specific policies that are presenting barriers to telehealth growth and sustainability.</b>
ER 5.1	MEDCOM Telehealth Service line shall revisit policy surrounding necessity of written informed consent and propose a verbal informed consent for TH.
ER 5.2	MEDCOM Telehealth Service line shall present credentialing and privileging challenges to DoD and VA QM offices that allow credentialing by proxy and encourage them to explore credentialing and privileging to make the process easier.
<b>ER 6.0</b>	<b>MEDCOM Telehealth Service line shall encourage learning and best practice sharing across the Army TH enterprise.</b>
ER 6.1	MEDCOM Telehealth Service line shall develop a more structured peer review form as an aid to improve care deliver.
ER 6.2	MEDCOM Telehealth Service line shall work with GME office to include TH within GME training requirements.
ER 6.3	MEDCOM Telehealth Service line shall invite and promote participation of non-RMC TH leaders within community of practice calls.
ER 6.4	MEDCOM Telehealth Service line shall pair new MTFs with “mentor” MTFs to help facilitate best practice sharing as they develop TH capabilities.
<b>ER 7.0</b>	<b>MEDCOM Telehealth Service line shall collaborate with HP&amp;S, MRMC, and AMEDD C&amp;S to develop a mobile health strategy and pilot projects for the Army enterprise.</b>
ER 7.1	MEDCOM Telehealth service line shall develop POM to support mobile services delivery to ensure emerging technologies, such as mobile health data services, e.g. smart medical devices and smartphones are efficiently accessible on GSA schedules.
ER 7.2	MEDCOM Telehealth service line shall remove barriers associated with moving an emerging technology from the pilot phase into the continuum of care if proven technically feasible and cost & clinically-effective.
ER 7.3	MEDCOM Telehealth service line shall develop pilot projects to test, evaluate, and demonstrate the cost effectiveness and technical feasibility of allowing “bring your own” mobile devices to be used on the other side of the firewall.

## **Future State Architecture**

### **External Ecosystem**

As we began to architect the future state, we first considered the external ecosystem surrounding the TBH enterprise as discussed in Chapter 4. Moving forward, we realized two

near-term events would have a large impact on the future state of the enterprise: 1) both OIF and OEF coming to a close and 2) implementation of the NDAA (STEP Act). As telehealth evolves, these two “events” will impact the type of service delivery architecture needed to execute potential increasing telehealth demands in the future. First, regarding the drawdown of OIF and OEF, more service members will be in garrison and starting to mentally “drawdown” out of combat mode, which potentially could increase the demand for psychological health services. This is validated by the graph in Chapter 4 which depicts the increase in psychological services more than 12 months after returning home from deployments for service members with 2-3 deployments (this number of deployments is common with over ten years of war in OIF and OEF). In addition, the wars coming to a close could potentially impact the funding available for telehealth services, so there is a need to develop a sustainable channel of funding for TBH (ER 1.1) and ensure “lean”, valued-added processes are in place that are not wasteful or non-value added within the enterprise. Therefore, our strategy view will outline details for architecting a sustainable business model for telehealth. Secondly, the implementation of the STEP act could help enable patients and providers to engage in care on and off federal property, expanding care to service members that are geographically separated. Therefore, our organization view section will highlight our proposed architecture to help enable a more distributed, network approach to telehealth in the Army.

Despite these considerations, it is also critical that we reflect about the potential “known-unknowns” or the “unknown-unknowns” as we architect the future state. As Rhodes and Ross stated, “in order to deliver value, a successful system must dynamically overcome changing contexts and needs” (Rhodes and Ross, 2008). To take these changing contexts and needs into account, it is important to think about future epochs when architecting the future state enterprise. They define epochs as “time periods with a fixed context and needs; characterized by static constraints, concepts, available technological and articular expectations.” Utilizing epoch-based thinking is helpful in thinking about potential future contexts and outlining a strategy for considering these evolving needs and concerns. Therefore, we have presented an epoch-based analysis utilizing “epoch variables” based on the enterprise views (Rhodes et al, 2009). We have outlined these four epoch variables (strategic factors,

organization changes, policy changes, and infrastructure developments) based on the enterprise views in Table 6 below and we have highlighted potential future epochs to consider as we architect the future state.

**Table 6: Epoch Variables Based on Enterprise Views**

Epoch Variable	Potential Future Epochs
Strategic factors	<ul style="list-style-type: none"> <li>● Political contexts               <ul style="list-style-type: none"> <li>○ Shift in parties or elected officials</li> <li>○ New or evolving operations or enemy threats</li> </ul> </li> <li>● New healthcare delivery models               <ul style="list-style-type: none"> <li>○ Patient centered medical homes</li> <li>○ Accountable care organizations</li> </ul> </li> </ul>
Organization Changes	<ul style="list-style-type: none"> <li>● User needs or markets (emergence of significant new or changed stakeholder needs)</li> <li>● Telehealth centralized across all services (Navy, Army, AF, and Coast Guard)</li> <li>● Partnerships or collaborations with other governmental agencies (VA, HHS, NIH, CMS) or commercial sector (American Well, Payers, Provider networks, Vendors)</li> <li>● Increase or decrease in enterprise personnel</li> </ul>
Policy Changes	<ul style="list-style-type: none"> <li>● Reimbursement policies               <ul style="list-style-type: none"> <li>○ Center for Medicare and Medicaid Policies</li> <li>○ AMEDD HP&amp;S adopting a new reimbursement strategy</li> </ul> </li> <li>● Licensure, Credentialing, and Privileging policies</li> <li>● Information assurance policies</li> <li>● HIPAA privacy and security policies</li> <li>● New or limited funding resources</li> </ul>
Infrastructure Developments	<ul style="list-style-type: none"> <li>● Emerging technologies</li> <li>● New infrastructure deployments or removing old infrastructures</li> <li>● Convergence of systems with VA or other government agencies</li> <li>● Virtual Reality</li> <li>● Singularity</li> </ul>

Therefore, based on these variables, we have attempted to anticipate future epochs. One example of this epoch-based analysis leveraging the enterprise views is shown below in Table 7 as we consider potential future contexts of the TBH enterprise during peacetime and wartime (this epoch was outlined under the ‘strategic factors’ variable). Within each of the epoch period, we outline various goals and focuses for the enterprise in delivering value based on this evolving context.

Table 7: Epoch-based analysis of goals for the future state TBH enterprise in the context of peacetime and wartime in the future state

<b>Enterprise Views</b>	<b>Epoch 0 Drawdown out of OIF and OEF</b>	<b>Epoch 1 Peacetime (no PH/TBH funds)</b>	<b>Epoch 2: Emergence of new combat operation</b>
Strategy	Provide sufficient resources to maintain and build a flexible, learning force	Build a resilient, sustainable force using holistic, systems thinking	Build a resilient, sustainable force
Policy	Develop policy based on operation lessons learned and maintain resources	Develop policy considering emergence of new enemy threats and the needs of the enterprise and build system for developing and implementing new policies. Maintain or build resources.	Implement new policies efficiently
Organization	Maintain human capital (do not “fire” individuals spontaneously as a short term solution to “deal” with less funds)	Maintain human capital and build DoD and MEDCOM organizations	Focus human capital on needs of the service members and their families
Processes	Analyze current processes and apply lean thinking principles focused on value delivery and eliminating waste	Implement and pilot revised policies with a focus on value deliver, eliminating waste, and both effective and efficient processes	Focus on maintaining and improve processes
Services	Treat acute and chronic conditions.	Deliver preventative service and treat chronic conditions	Deliver preventative treatments and treat acute and chronic conditions
Infrastructure	Analyze infrastructure use cases	Develop and envision new infrastructure system requirements	Develop and implement infrastructure system requirements

## **Stakeholders**

Chapter 4 highlights the stakeholders within the TBH enterprise. Although the enterprise stakeholders will not evolve dramatically, the future state architecture should prioritize certain stakeholder groups based on specific stakeholders needed not being met in the current state. These two prioritized stakeholder groups are 1) telehealth service line organization and 2) underserved populations (namely RC/NG, retirees, and families), which will be described further in the coming paragraphs.

Enterprise requirement 1.1 describes the importance of creating a telehealth service line. Currently, the AMEDD telehealth office is part of the Health Policy and Service Organization and the future state architecture will help formalize their role through a core funding stream and appoint them as the telehealth service line as the proponent of MEDCOM telehealth funding. As the formalized “owners” of telehealth service line within the Army, they can continue to help serve as the conduit between the policy/strategy level stakeholders and the execution level stakeholders. However, one need of this organization in the current state was that they had no funding to carry out their vision and services. Therefore, the telehealth service line will help meet requirement ER 1.1 and help manage this core funding. In addition, the service line will help provide RMCs with clear policy guidance, but regional medical commands will be granted execution authority and autonomy to device and manage the appropriate TH services for their region (ER 1.3). It will important for them to help establish enterprise standards while retaining flexibility for the TH chiefs to manage their services to remain responsive to local needs of their facilities and patients. This will help empower enterprise stakeholders at the execution level and also help them tailor services based on the needs of their care receiving stakeholders.

In the current state, specific populations were raised as underserved within the TBH enterprise. Specifically, the RC/NG, families, and retirees had little to no access to telehealth services. Therefore, enterprise requirement 3.0 instructs the telehealth service line to identify these underserved populations through metrics across the enterprise that could benefit from the expanded access that TBH services could provider. The telehealth service line should analyze data sources to understand the size of underserved populations and tailor TBH services

based on this evaluation, establishing access points to utilize TBH (ER 3.1). In addition, they should recapture and target TBH services for populations diverted to the TRICARE network during period of high demand (ER 3.2). By leveraging available data within the enterprise, they can use telehealth as a means to provide better access to behavioral health care delivery services and better meet their healthcare needs. The implementation of the STEP Act will help lower barriers and provide better access to these services because the location of the provider and patient will no longer be as large of an issue. The future state architecture should identify locations and facilities for these underserved populations to develop telehealth capabilities and infrastructure. For example, state local armories should establish telehealth service capabilities as needed based on need. Flexible whisper booths have been successfully implemented in the regions for active duty service members and these could be leveraged for these underserved populations.

In addition, the current care-receiving stakeholders with the enterprise will still be a priority group in the future state architecture. Currently, a large portion of the TBH services consists of encounters during the reverse SRP processing. It was highlighted during many stakeholder interviews that the future state should consider the importance of further implementing telehealth services that deliver therapeutic care (will be discussed further in the services section), not just tele-screenings and tele-assessments. In addition, careful attention to needs to be paid in the future state architecture to establish trust between telehealth providers and patients. An initial face-to-face meeting when possible can help establish a therapeutic alliance as the enterprise evolves to more therapeutic services (along with continuing to deliver screening and assessments). These more routine encounters with screening and assessments helps establish protocols and practices for telehealth. It will be important to leverage these lessons learned as more TBH therapy services grow across the enterprise.

Finally, one stakeholder group at the cusp of the strategy and execution levels is the United States Army Medical Information Technology Center (USAMITC). This organization is critical to infrastructure and execution of TBH services across the enterprise. Specifically, they are charged with “providing enterprise audio and video conferencing for the Army Medical Department and other DoD customers and agencies worldwide.” They help train and deploy

JABBERS across the enterprise. Despite this, they are concerned for their funding and have survived up to this point due to leaders from HP&S swooping in and providing them funding. In addition, the current state stakeholders feel that a large divide between them and the CIO organization (another key infrastructure stakeholder for the TBH enterprise). Army leaders need to consider the importance of those stakeholders at the execution level who literally keep the network up and running and need to take greater strides in the future state architecture to bring together these stakeholder groups into policy and organizational considerations to better engage them and understand their needs.

### **Strategy**

As part of the TBH strategy going forward in the future state architecture, the vision is articulated through the enterprise requirements described in the first part of this chapter. In particular, I have summarized several central core components of the vision going forward:

- Generating a vision for a 'virtual' MTF outside of 'brick and mortar' MTF sites, which further enables telehealth delivery in MTFs, federal facilities, NG/RC armories, non-federal facilities, and the home.
- Developing a telehealth service line and sustainable business model for the Army telehealth enterprise.
- Providing TBH services to the current patients and the underserved populations in the enterprise and integrating these services into the continuum of care of these patients.
- Establishing the underlying telehealth infrastructure to help better meet demand for BH services in the future and scaling this infrastructure to the other services (namely Navy and Air Force).
- Leveraging emerging technologies, such as mobile health, to help improve access to timely care and provide more coordinated care for service members and their families.

With the potential of PH/TBI funding decrements associated with the planned drawdown of theater operations, it is important to transition TBH funding to a programmed line



item in underscore funding. There is a need to build a sustainable business plan for TBH across the enterprise that documents the case for TBH and demonstrates the value of TBH both in augmenting care and in saving resources across the enterprise. The business plan should include incentive structures to help encourage telehealth engagement across the enterprise. As stated by Zott and Amit, “a business model should be geared to total value creation for all parties involved... the greater the total, the greater the focal firm’s bargaining power and the greater the amount of value it can appropriate” (Zott and Amit, 2010). Therefore, to increase the value for all stakeholders, a proposed business model (i.e. revenue generator to make telehealth sustainable) is that reimbursement rates would be such that telehealth could pay for itself out of Core budgets, which are received in part out of RVUs generated in the previous year via services including telehealth. A high enough reimbursement rate could induce Commanders to adopt the technology, much like many technologies in the civilian sector. Therefore, we propose the development of an appropriate, yet competitive reimbursement rate for telehealth to incentivize commanders to further adopt telehealth implementation of services within their regions. Currently, it has been documented that telehealth provides reimbursement at 80% of the rate of face to face care. Because studies (as documented in Chapter 3) show that TBH services are equivalent to face to face care, telehealth deserves the same reimbursement rate as face to face care. Along with establishing an equivalent reimbursement rate for telehealth within the enterprise, enterprise stakeholders need to advocate to leaders both inside and outside the Army enterprise. For instance, the Center for Medicare and Medicaid Services (CMS) currently dictates reimbursement rates that are adopted by the Army (and frankly for the rest of the DoD, Medicare/Medicaid services, and civilian healthcare sector payers). Therefore, due to this need to ensure services are provided to service members and their families faced with behavioral health concerns, telehealth stakeholders should advocate to CMS to change their telehealth reimbursement rates. Thus, the development of a sustainable business model and plan will satisfy ER 1.2.

Along with establishing a sustainable business model for the telehealth (and therefore the TBH enterprise), a manpower model would help further support the case for funding telehealth across the enterprise and document the types of personnel resources needed to

support this enterprise. To complete a manpower model analysis, you should answer a standard set of 7 questions defined by the Army: (1) What work/functions/tasks are required by an organization?, (2) Why does the organization do that work?, (3) How is it done?, (4) How often does the organization have to do the work?, (5) What external decision/factor drives this frequency?, (6) How long do the tasks take to accomplish?, and (7) What influences the time? By developing a manpower model for the telehealth enterprise, it can more accurately account for personnel and more effectively allocate the appropriate manpower resources for the future. This is shown in Figure 24 below which summarizes the motivation for establishing manpower models in the Army.

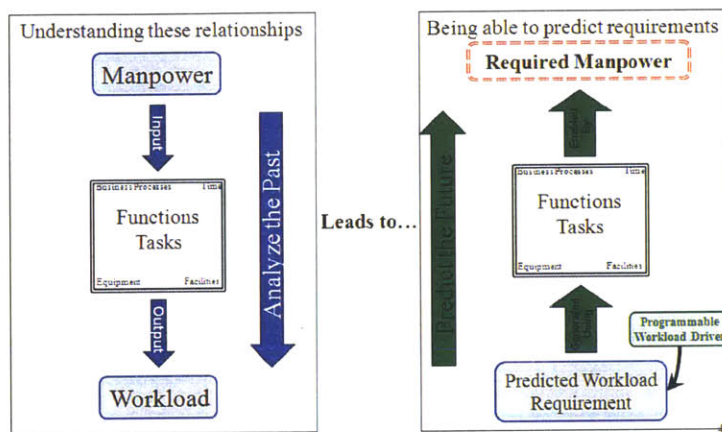


Figure 24: United States Army Manpower Model (Source: USAMAA presentation)

In addition, mobile health was highlighted as one method to help augment and extend services to service members and their families by both internal and external stakeholders in the future state architecture (ER 7.0). Program Objective Memorandum (POM) support would be a necessity to further develop this service delivery mode beyond the current pilots, such as mCARE. In addition, several barriers, specifically information assurance issues, were raised as hindrances to developing mobile applications beyond the pilot phase. (Note: the specific policies will be addressed in the policy view section.) For instance, there are several issues with patients utilizing their own devices for these applications. Therefore, to demonstrate technical and social feasibility of mobile health usage within the future state architecture, pilot projects will be needed to test, evaluate, and demonstrate the cost effectiveness and technical feasibility of allowing “bring your own” mobile devices to be used on the other side of the

firewall to protect the secure DoD network. Mobile technologies will most likely require work with outside contractors, so it is critical to allow outside stakeholders with emerging technologies to receive a General Services Administration (GSA) calendar spot in a timely manner (Note: GSA helps manage the government contracting process). The future state architecture should leverage mobile health applications for readiness, preparation, and prescription renewals.

### *Enterprise level metrics*

Metrics (both at the enterprise and daily operations level) need to be further leveraged in the future state to demonstrate the value of telehealth. Specifically, by providing an equivalent reimbursement rate for telehealth as face to face care, the appropriate metrics need to be put in place to show the value of telehealth at the enterprise level, along with developing a manpower model as suggested above to measure the personnel and resources needed to execute telehealth. In addition, one concern addressed in the current state was that telehealth helped decrease cost at the Army enterprise level, but was costly to MTF commands because they were not getting “credit” for services provided outside of their facilities. Therefore, there was no incentive for MTF commanders to continue to support telehealth capabilities. Although the telehealth service line and more accurate accounting of telehealth services will help alleviate this concern, there is need for metrics to demonstrate the value at all levels of the enterprise. A standard set of TBH metrics deployed across the enterprise (ER 2.1-2.2) should be implemented in the future set and will help set the foundation for development of a business plan as proposed in enterprise recommendation 1. These metrics should include, but not be limited to, cost avoidance metrics, types and numbers of encounters, no-shows, productivity measures, and patient & provider satisfaction. Table 8 below highlights three types of metrics: clinical, productivity, and systems level. It is recommended that the future state enterprise develop a dashboard to address metrics in these three major categories to capture the value of telehealth at all levels of the enterprise. It is important to look at cost avoidance, instead of overhead, because decreased travel time, decreased loss of duty time, and cost savings may not go right back into one sub-organization’s pocket, but an effective cost benefit analysis could benefit the enterprise as a whole. From there, the telehealth service line could provide the

appropriate funding back to the relevant stakeholders. It has been shown in the literature that telehealth is actually more expensive than face to face care, despite the fact that it saves money systemically because it saves times on travel, etc. Therefore, the telehealth service line should recognize this value and account for it appropriately. Furthermore, these metrics need to be shared across the enterprise through a common platform, such as SharePoint. In addition, another issue raised was that the same telehealth services often have different names across the enterprise. This makes tracking services across the enterprise difficult and complicates the issue of gathering data in a consistent and cohesive manner. A common nomenclature scheme is needed for telehealth services across the enterprise. In terms of measuring feedback from key stakeholders, discussions highlighted that patient satisfaction surveys are currently not executed consistently across the enterprise for behavioral health, and having the data would help better inform TBH delivery. Satisfaction surveys need to be implemented across the enterprise to better measure the success or shortfalls of telehealth services. Finally, a randomized controlled trial (RCT) will help show the value of TBH services within the Army enterprise and help define evidence-based metrics and standards of care moving forward. This will help justify telehealth not only at the execution level, but will help drive policy that further supports and validates telehealth growth across the enterprise.

**Table 8: Future State TBH Dashboard Metrics**

<b>Metric Type</b>	<b>Metric Examples</b>
Clinical Metrics	Psychological health scales and indexes (ex: PCL, CGI-S, CGI-I, GSI, PSDI, PST, DSM-III-R (SCID)), symptom reductions, treatment response, remission, health status, health quality of life, clinical outcomes
Productivity Metrics	Types and # encounters, no-show rates, attendance, # prescriptions, # laboratory tests, throughput metrics, treatment attrition/dropouts, medication adherence, adherence ratios
Enterprise/system level metrics	Treatment costs, travel costs, technology costs, QALYs/cost effectiveness, cost avoidance, costs (associated with the beneficiary, medical system, and the military organization utilized to access mental healthcare: civilian HMO network, patient travel to military facility, military providers travel to remote clinics, and telemental health), patient and provider satisfaction

## **Policy**

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The future state architecture of the TBH enterprise needs to address four major charges based on our current state analysis:

- Developing more efficient policy creation/ interpretation processes and developing feedback mechanisms from execution level stakeholders.
- Providing more relief for enterprise stakeholders on antiquated policies limiting the progress and growth of telehealth, specifically surrounding informed consent, credentialing and privileging, and information assurance policies.
- Collaborating with other government agencies to create more unification on policies on the Joint Commission level, DoD, VA, and CMS.
- Architecting policies in the future that are flexible, can evolve with technological progress, and with different local needs across the enterprise

First, the future state enterprise will need more efficient policy creation and interpretation processes (ER 1.3). The author's current state analysis highlighted that the NDAA/STEP Act would take approximately 3-5 years to get interpreted down from Congress to the DoD to Big Army to MEDCOM to Army RMCs. In addition, this timeline does not include the time it took to pass the NDAA/STEP Act through Congress. With more immediate needs and evolution of technology, this timeline is not acceptable in the future state. DoD and Army leaders need to work closely with Congress and with their respective organizations to apply lean methodologies to look at the policy creation and interpretation processes. Lag times and wasteful activities should be lessened or removed entirely for the benefit of the warrior and their families. It will be much harder to drive motivation to change the policy creation process in times of peacetime where the need is not as pervasive and political. Also leaders need to further consider the unintended consequences of their policies. One solution is to involve with execution level stakeholders in the policy creation policy so that they may provide "real-world" insight on the generation of policies. The telehealth service line should take the lead on ensuring that execution level stakeholders are involved. Also they should consider the long

term effects of creating policies utilizing the enterprise lenses and epoch analysis as frameworks.

Second, there is a strong need for relief on antiquated policies limiting the progress and growth of telehealth (ER 5.0), specifically surrounding informed consent, credentialing and privileging, and information assurance policies. Several policies were highlighted as outdated and as hindrances to the growth of telehealth across the enterprise. Specifically, telehealth services requiring written informed consent (ER 5.1), which is rarely done with other non-invasive healthcare services delivered in the MHS. It would be helpful to revise AR 40-66 to allow for verbal informed consent documented in the electronic medical record. In addition, information assurance policies were viewed as a hindrance to the establishment of telehealth delivery systems. Current information assurance policies create inefficient processes and will be a barrier to setting up mobile health systems and new telehealth infrastructure. Leadership needs to help drive relief surrounding information assurance policies and revisit specific policies that hinder the adoption of new technologies. In particular, each organization seems to have their own information assurance “shop”, which creates inconsistencies across the enterprise. Information assurance policies need to meet the needs of evolving technologies and also not hinder technological and systems growth. Also leadership needs to move past privacy and secrecy concerns to allow for providers and users to connect. Finally, credentialing and privileging processes are too slow and not standard across the enterprise and need to be discussed and revised by the DoD and VA Quality Management offices because they are above the scope of the Army medical enterprise (ER 5.2). A standard set of credentials and privileges should be available for all telehealth providers to practice across state lines and even provide care to patient’s home or deliver care from the comfort of their own home.

Third, there needs to be more unification on policies at the Joint Commission level, DoD, VA, and CMS. Each organization is executing on telehealth separately and there are several best practices that could be more effectively shared and collaborated on as telehealth is still evolving. As mentioned above, credentialing and privileging needs to be addressed, but reimbursement for telehealth across all these institutions needs to be looked at closely to ensure a sustainable model for telehealth. The needs of telehealth are not unique to the DoD. These

organizations have an opportunity to drive change and evolution of telehealth systems that could be readily adopted by the commercial sector. The future state architecture stakeholders (specifically involving the Army telehealth service line) should develop a joint telehealth task force, including the major government agencies involved with telehealth (DoD, VA, CMS, HHS, USDA, FCC) commercial entities (payers, healthcare networks, technology vendors – large companies and start-ups), and trade associations (American Telemedicine Association, American Medical Association, American Hospital Association) to develop a path forward for telehealth policies to meet stakeholder needs. In addition, they should include individuals at all age levels to represent their diverse perspectives.

Fourth, future policies need to be flexible to evolve with both future disruptive technologies and various local needs across the enterprise. Policies need to match local needs of facilities at the ground level, along with the global need for standardization. Policy needs to support the leading edge of technology to not hinder it, but help promote adoption of it. In addition, policies need to address processes that can be standardized generally across the enterprise, but allow RMCs to have full execution authority to make it specific and relevant for their respective providers and patients (ER 1.3).

## **Organization**

The future state organization will be addressed through three major categories: governance, structure, and human capital.

### **Governance**

As described in the stakeholder section, the future state governance of telehealth will be defined by two core requirements:

- Telehealth service line shall be the proponent for MEDCOM telehealth funding, build a sustainable business model for telehealth, and “own” telehealth policy for the Army (ER 1.1-1.2)
- Regional Medical Command telehealth organizations shall have execution authority and autonomy to decide and manage telehealth services for their regions (ER 1.3)

Telehealth service line should not operate in segregation from MEDCOM and Health Affairs because telehealth should not evolve as a separate stream of care, but help augment care in the enterprise through more ready access to timely services. Also RMC telehealth leads should work closely with leadership within their region to advocate and show the value of telehealth and help market telehealth capabilities to providers and patients.

### *Structure*

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Currently, the service delivery architecture of the telehealth enterprise is a hub and spoke model. Moving forward, the authors wanted to investigate two future state architectures: 1) Modified hub and spoke model with increased spoke locations vs. 2) Networked, Distributed model (with limited hubs). Each of these proposed architectures is described in the following paragraphs.

Our first proposed future state architecture is a modified hub and spoke model with increased spoke locations over the current state. In this architecture, telehealth providers are mainly “housed” with the hub. The satellite locations could consist of other MTFs, NG/RC armories, other federal facilities, or non-federal facilities (such as health facilities or the home). The STEP act is a major enabler of telehealth care to non-federal facility locations. In addition, safety procedures will be needed to be put in place to allow telehealth delivery to the home (this applies to both architectures). Also each telehealth RMC lead is located at the hub. This architecture is advantageous because it is easier to coordinate, share best practices, and more efficiently develop and execute telehealth processes. However, our field work and stakeholder interviews found that the hub and spoke model has higher overhead costs associated with maintaining the hubs. This was further validated by data from the analysis & evaluation division of the Army.

Our second proposed future state architecture is a networked model of telehealth with providers distributed throughout the enterprise. Therefore, the telehealth enterprise would not be divided by regions because providers would be dispersed with the telehealth service line overseeing the network as the governing body. Both telehealth providers and patients could be located in MTFs, NG/RC armories, other federal facilities, or non-federal facilities (such as health facilities or the home). As discussed above, both the STEP act and safety procedures



would be enablers for practicing telehealth outside of MTFs. This architecture is advantageous because it is much more affordable from an economics standpoint. However, with the absence of hubs and thus RMC telehealth leads, there is little oversight on telehealth providers and it is much harder to pull off from a coordinator standpoint.

To evaluate these two proposed future state architecture, the authors developed criteria based on the enterprise requirements defined at the beginning of chapter 5 based on our stakeholder and current state analysis. These criteria are accountability, affordability, sustainability, flexibility, accessibility for patients, accessibility for providers, accessibility to information systems, scalability, adoptability, and usability. Each of these criteria or “illities” is traceable to the enterprise requirements and will be described further below:

- Accountability (traceable to ER 1.1): Telehealth providers are accountable or responsible to some form of telehealth governance. In the current state, telehealth providers are accountable to their MTF and the RMC telehealth lead.
- Affordability (traceable to ER 1.2): Telehealth services will be cost-effective. The services themselves will show value despite the “extra” technology and overhead costs due to the value they provide in cost avoidance and more accessible and timely care to prevent increase in symptoms or healthcare costs in the future. In the current state, telehealth has been shown to be more expensive than face-to-face care.
- Sustainability (traceable to ER 1.2): Telehealth services will essentially pay for themselves through telehealth reimbursement rates and RVUS and also are supported by telehealth core funding. In the current state, telehealth is reimbursed at 80% of the rate of face-to-face care and has no core funding stream.
- Flexibility (traceable to ER 1.3): Telehealth policies will be flexible and adaptable to local needs. In addition, providers will be able to practice anywhere and patients will be able to receive care in a location of their choosing. In the current state, telehealth policies are somewhat flexible to their location, but patient and provider locations are not very flexible because both stakeholders need to be on a federal facility.
- Accessibility for patients (Traceable to ER 3.1, 3.2, 4.1 and stakeholder needs in Chapter 2): Patients can seek telehealth care in their homes or in a location of their choosing. In

the current state, patients can only seek telehealth care on federal facilities, namely MTFs.

- Accessibility for providers (Traceable to ER 3.1, 3.2, 4.1 and stakeholder needs in Chapter 2): Providers can provide telehealth care in their homes or in a location of their choosing. In the current state, providers can only provide telehealth care on federal facilities, namely MTFs.
- Accessibility to information systems (Traceable to ER 4.0): Providers will be able to access an enterprise wide solution for operational and electronic health record information from any locations. In the current state, it is hard to schedule and get access to electronic health record information in a timely manner across platforms.
- Scalability (Traceable to ER 3.2): Telehealth capabilities (i.e. services, processes, and infrastructure) can scale quickly across the enterprise to better meet demand of services. In the current state, it is highly variable in the length of time it takes to set up telehealth capabilities at different locations.
- Adoptability (Traceable to ER 4.1): Telehealth practices and processes will be readily adopted by telehealth providers and staff. In addition, telehealth patients will be comfortable with receiving services over VTC and mobile phones. In the current state, most providers and patients are equally satisfied with telehealth care compared to face to face, but there is some adjustment period for stakeholders to warm up to this evolving form of care.
- Usability (Traceable to ER 4.2): Telehealth infrastructure, namely the VTCs, is easy to use and intuitive. In the current state, the Video Network Center is instrumental in keeping VTCs easy to use.

To evaluate each of our proposed future state architecture, we will utilize the Pugh Matrix as shown in Table 9 below. The Pugh analysis is a tool utilized to rank technologies, systems, or in our case, enterprises (Pugh et al, 1996). Each criteria listed is traceable to their respective enterprise requirement. Each of the architectures was ranked according to the following scheme: +1 = better meets criteria over current state, 0 = meets the criteria equivalently to the current state, and -1 = does not meet criteria compared the current state.

**Table 9: Pugh Analysis of Future State Architectures**

(Note: Ranking Scheme is tallied in a red shade below. +1 = better meets criteria over current state, 0 = meets the criteria equivalently to the current state, and -1 = does not meet criteria compared to the current state)

<b>Requirement Traceability</b>	<b>Criteria (Illities)</b>	<b>Baseline: Current State (Hub and Spoke)</b>	<b>Architecture 1 Modified Hub and Spoke (Increase Spoke Locations)</b>	<b>Architecture 2: Networked and Distributed</b>
ER 1.1	Accountability	0	0	-1
ER 1.2	Affordability	0	0	+1
ER 1.2	Sustainability	0	0	+1
ER 3.2	Flexibility	0	0	+1
ER 3.1, 3.2, 4.1	Accessibility for patients	0	+1	+1
ER 3.1, 3.2, 4.1	Accessibility for providers	0	+1	+1
ER 2.1, 4.0	Accessibility to information systems	0	0	-1
ER 3.2	Scalability	0	0	+1
ER 4.1	Adoptability	0	0	-1
ER 4.2	Usability	0	0	-1
	<b>+1</b>	<b>0</b>	<b>2</b>	<b>6</b>
	<b>-1</b>	<b>0</b>	<b>0</b>	<b>4</b>
	<b>0</b>	<b>10</b>	<b>8</b>	<b>0</b>

As shown in Table 9, Architecture 1 has the largest number of '0' rankings, thus making it the 'easiest' architecture to transition to from the current state because it is most similar to the status quo. In contrast, architecture two was ranked with the highest number of '+1' (which gets cancelled out by the -1 values) to be a '+2' ranking, thus best meeting the criteria of the two architectures. Therefore, the authors propose adopting a modified hub and spoke model (architecture 1) initially that gradually transitions to a more distributed architecture (architecture 2) by gradually drawing down the need for the hubs. As the telehealth system matures, policies for developing "spoke" or satellite locations will become less stringent, thus making processes easier to adapt to new locations. The knowledge section will further discuss the practices to developing new telehealth locations. In addition, to help provide better coordination and coordination of telehealth providers with architecture 2, we propose telehealth providers be accountable to a telehealth lead, who then "reports" up to the

telehealth service line/AMEDD telehealth office. Finally, an enterprise-wide solution that supports seamless flow of operational information (i.e. scheduling) and the electronic health records across platforms will be vital to the development of a networked architecture for telehealth in the future state. Figure 25 below highlights the transition of telehealth from a cottage industry initially as it was first developed due to local needs to the pilot phase to the current state of hub and spoke. Finally, we propose the transition to a networked approach for the telehealth architecture in the future states. Each of the lenses is summarized in these four architectures.

<b>Stage</b> <b>Lens</b>	<b>Cottage Industry</b>	<b>Pilot</b>	<b>Hub &amp; Spoke</b>	<b>Networked</b>
<b>Strategy</b>	Bottom up, Driven by Need	Bottom up, Short term execution	Top Down Regional Support, Bottom up execution	Enterprise level top down support, Bottom up execution
<b>Organization/ Human Capital</b>	Grassroots, No dedicated time	Short term dedication resources, limited incentives	Dedicated resources, mediocre incentives	Dedicated resources, strong incentivizes
<b>Infrastructure</b>	Legacy	Legacy	Legacy with workarounds	Integrated
<b>Policy</b>	Leverage existing policies	Leverage existing policies	Guidelines surrounding existing policies (uncertainties)	Supportive policies driven by knowledge gained by execution
<b>Processes</b>	Grassroots	Iterative, Piece - Mealed	Standardization within hubs & spokes	Enterprise wide Standardization
<b>Services</b>	Niche	Niche	Alternative option	Primary Service Delivery Mechanism
<b>Knowledge</b>	Limited, Gathering info	Documenting Practices	Developed, Limited Knowledge Sharing, Siloed	Extensive knowledge sharing with dedicated integrated work group to collaborate

Figure 25: Enterprise View/Lens Analysis of Telehealth Architectures over Time

### **Human Capital**

As discussed in the strategy section, a manpower model will be instrumental in allocating the appropriate resources to provide financial support for telehealth staff and providers. In addition, it will be important to have personnel that can be flexible to support telehealth capabilities in the more distributed model. As an example, the Video Network Center is located in San Antonio but they provide support to the entire telehealth enterprise. Staff on both the patient and provider end creates a great deal of overhead for the telehealth enterprise. With the transition to telehealth in the home, it will not be possible to have telehealth staff on both ends of the care delivery. Therefore, a centralized staff to help with

trouble shooting of the telehealth encounter (perhaps built into the Video Network Center that already operates effectively and efficiently). In addition, processes should be developed to train both patients and providers alike to administer and setup telehealth connections. In addition, patients in an ideal state could be trained to schedule their own appointments through an online patient portal.

## **Processes**

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In the future networked state, telehealth processes will need to be flexible and adaptable to different locations with little overhead support. Based on guidance received during a lecture by Dr. David Blumenthal, the former National Coordinator for Healthcare IT, it is important to develop standards surrounding core, enduring processes that will be needed despite evolving forms of technology and infrastructure. Therefore, the authors propose developing standards surrounding the processes listed below that can also be adapted to meet local needs of different locations across the network.

### Processes Prior to Encounter:

1. Scheduling of patient, provider, and infrastructure resources.
2. Training of telehealth providers and staff (including clinical, technology, and safety procedures).

### Processes Immediately Surrounding and Within Encounter:

1. Ensure access of provider to medical record prior to encounter.
2. Complete consenting procedure.
3. Conduct encounter and deliver care.
4. Schedule follow-up (if needed).
5. Update medical record.
6. Order prescriptions (if needed)
7. Account for encounter.

Each of the aforementioned processes should be flexible to the different locations and stakeholders executing them. For the processes prior to the encounter, the patient, provider, or

a telehealth staff member could schedule the encounter as long as there is an enterprise-wide information system available with a patient portal access point. Also training procedures will be standard across the enterprise, but providers and staff can get trained through an online training module independent of location. For the processes immediately surrounding and within the counter, providers could access the enterprise wide solution in any location. The consenting procedure could happen verbally over VTC and does not need a written signature, thus reducing the need for faxing or other alternative ways of getting a signature from the patient. Updating the medical record, order prescriptions, and accounting for the encounter can all take place through the enterprise wide information systems solution.

To help vision and outline processes that would be needed in the future state, the authors recommend the telehealth service line developing use cases and cross functional diagrams for potential future state scenarios. These use cases can help define what is not understood or achievable in the current state. Our stakeholder interviews and workshop outlined the need to develop the following use cases to help envision processes for the future state:

- Use Case 1: During drill weekends, RC/NG can see a remote provider. (In the current state, it is hard for RC/NG service members to see a uniformed provider. They are forced to go to a MTF Monday – Friday and take time off from their day job which is difficult from an accessibility standpoint because many reservists are not located near MTFs).
- Use Case 2: Providers can deliver care in their own homes, which would aid in recruiting providers and specialists to deliver care to more remote or rural locations.
- Use Case 3: Patients utilizing their own mobile devices and own equipment to receive telehealth treatments to improve both accessible and timeliness of care.

## **Services**

In the future state, there will be a common nomenclature of services (ER 2.3), which includes (but is not limited to), the following set of TBH services: psychiatry, psychotherapy, case management, medication management, mental status examination, psych test, psych education, behavioral health evaluation, group therapy, family therapy, medical/disability

evaluation, screening (ex: rSRP), patient triage, and forensics. It is important to consider the delivery of these services within current and future BH-related programs, such as the Integrated Disability Evaluation System (IDES), Child and Family Assistance Centers (CAFAC), Service Readiness Processing (SRP), Embedded Behavioral Health (EBH), Patient Centered Medical Home (PCMH), Re-Engineering Systems of Primary Care Treatment (RESPECT-MIL), School Behavioral Health (SBH), Alcohol and Substance Abuse Program (ASAP), and the Family Advocacy Program (FAP). Also the future state will be able to deliver this standard portfolio of services in all settings, including the MTF, RC/NG facility, VA, all federal facilities, medical settings, and homes. Telehealth services will not be delivered as a separate stream of care, but will be integrated into the continuum of care of patients and will augment care delivery to provide more accessible, timely treatments. Telehealth services will be inculcated in the way providers practice so it is not referred to as telehealth and will be another modality within the clinic. The enterprise wide information system will be instrumental in enabling this continuity of care to take place across the networked architecture. Also these services will be made available to the current set of patients receiving telehealth and also the underserved populations, such as the RC/NG, families, and retirees. Finally, telehealth services will be extended beyond the current video teleconference modality and will utilize other modalities of telehealth presented in Chapter 3. Mobile health services and home-based care with remote monitoring capabilities will help provide more timely access and monitor patients in their daily activities.

### **Infrastructure**

In the current state, the infrastructure was designed for in-person care. In our future state architecture, infrastructure needs to be part of the strategy conversation to better consider care outside of clinical facilities and other emerging technologies. The infrastructure needs to have political and financial visibility with leaders so that capacity keeps up with the intent. The Chief Information Officers need to be tied closer to the telehealth service line to ensure information systems are an enabler, not an impediment to the growth of the telehealth network, and that the appropriate levels of funding are available for the telehealth network. In addition, the information system needs to be designed surrounding the enduring, core processes of behavioral health care to ensure flexibility of telehealth network.

To enable this flexibility, the authors propose establishing an enterprise solution that supports the seamless flow of operational information and the electronic health record (ER 4.1). Specifically, a global scheduling platform that schedules patients, providers, and equipment will need to be accessible across the various platforms (ideally to staff, providers, and patients) to meet ER 4.1. In addition, the electronic health record needs to be accessible across the various platforms and can be updated in a timely manner. The information systems should integrate seamlessly with providers in the TRICARE network and VA. Also prescription and lab ordering and intake forms will be part of this enterprise wide information system. From an operational perspective, intake forms were not standardized or used across the enterprise in the current state and the integration of information from the intake forms into the electronic health record would enable the provision of more effective care across the enterprise. Finally, in the absence of a global platform, prescription and lab ordering require workarounds such as fax machines and emails. A single global platform for prescription and lab ordering would help eliminate the usage of these different and less reliable forms of transmission of information across the enterprise. In addition, the future state accounting system will utilize “ticklers” to help promote usage of the modifier (ER 4.2). The expected outcome from more effective utilization of the modifiers is clearer accounting for services provided. This accounting system would also leverage the newly proposed telehealth reimbursement rates established by CMS and adopted within the DoD and VA. Finally, the technology infrastructure, such as VTCs, will continue to be centralized in the USAMITC organization. This allows the technological infrastructure to be utilized more efficiently and effectively across the networked enterprise. This enterprise wide information system and centralized technological capabilities can then be scaled to the other services, namely Navy, Air Force, and Coast Guard, and potentially to other government agencies, such as the VA. This is a more cost- and time-effective means to scale telehealth capabilities. More efficient processes need to be developed to bring on new technologies to the network and get on the GSA schedule quickly.

Also facilities need to be designed to be flexible and also consider building in telehealth booths or locations dedicated to facilities. Whisper rooms and other flexible walls can be designed and built to be moveable and adaptable in each military facility in times of high



service demand. “Telehealth kits and packets” need to be created to give to patients and providers as they develop new telehealth facilities across the network. These packets will include requirements, criteria, and lessons learned to bring on new sites quickly.

### **Knowledge**

In the future state, telehealth training, education, and best practice sharing needs to occur more effectively across the network. With regard to training, telehealth training for providers need to be standard across the enterprise to ensure all providers are practicing to a certain standard. After the RCT generates evidence based practices for telehealth, these should be incorporated into the standard telehealth trainings across the enterprise. A more structured peer review form will be implemented across the enterprise to improve care delivery (ER 6.1). In addition, telehealth should be included with the Graduate Medical Education programs to teach the next generation of providers telehealth processes and care provisions (ER 6.2). Best practice sharing will be instrumental in a more networked, distributed enterprise. Best practice sharing should continue to occur over community of practice conference calls and telehealth stakeholders not in leadership roles should be encouraged to engage in the calls to share what they are doing on the front line (ER 6.3). To further encourage learning and prevent “reinventing the wheel”, new telehealth sites should be paired with a “mentor MTF” that has similar needs to help share best practices (ER 6.4).

### **Commercial Applications**

Chapter 5 to date has presented the authors view on the future state architecture of the TBH enterprise in the Army. This architecture and findings also have potential to be applied to the commercial delivery settings. Currently, care delivery is costly in traditional, brick and mortar settings in the civilian sector. There are two primary trends that are driving the need for improved delivery of healthcare services: (1) the worldwide population of 60 and above is growing and 2) chronic medical conditions and costs for care on the rise (United Nations, 2006; Kaiser, 2012). The rise of chronic conditions dictates the need for new “system/enterprise” requirements surrounding improved coordination of care for chronic diseases, better access to specialized care for underserved populations with complex disorders, and innovative business models to control costs. Currently, healthcare is shaped to be delivered more acutely as

opposed to be delivered as preventative or integrated into individual's daily activities. In addition, the building itself has become the most expensive technology in healthcare (Newbower, 2012).

Therefore, there is strong motivation to adopt new care delivery models to present more accessible, affordable care options for patients to bring care to patient rather than patient to care. There is a strong need for more innovative technology at the frontlines of care for wide impact, better chronic-disease management to reduce long-term costs, wider acute-care access for early intervention in illness, and tighter partnership between patients and caregivers. A large opportunity exists in the civilian sector to provide care and services when and where they are needed and make care more pervasive from formal to informal settings. This will potentially lead to better service, satisfaction, and outcomes.

In the current state, virtually every other industry (i.e. retail, information, communication, entertainment, banking, shipping, automotive transportation, etc.) technology decreases cost, improves performance, and increases access, except for healthcare (Newbower, 2012). In healthcare, "technology" seems synonymous with "increased cost." In addition, the current system is fragmented with isolated islands of technology and does not reward "healthcare systems" technology. For example, it is rare for electronic medical information to be interoperable across facilities and be exchanged seamlessly. To create a more connected healthcare ecosystem that delivers care outside of clinic walls, new systems architectures will need to be developed to better meet these new "requirements" dictated by growing trends and needs. Based on our analysis, similar policies (i.e. reimbursement and licensing/credentialing, and privileging), organizational structures (architecture delivery models and personnel), care delivery processes, infrastructure systems, and knowledge sharing capabilities proposed in Chapter 5 could be implemented in the commercial sector. However, a fundamental different strategy, business model, and incentive structure will need to be developed in the civilian sector because it currently does not operate in a single payer model (like the DoD).

## *Future Work and Next Steps*

The current healthcare system is presented with several perplexing challenges surrounding rising costs, a strong need for improvement in quality of care, and difficulties accessing timely care. In particular, there is minimal care coordination across the various stakeholders that contribute to a patient's care delivery, such as coordination among primary care physicians, specialists, pharmacy, community hospitals, etc., which is mainly due to the lack of incentives (both organizationally and financially) to work together to best manage a patient's care. Therefore, "global payments" and "Accountable Care Organizations" (ACOs) or "networks of physicians and other provider that are held accountable for the cost and quality of the full continuum of care delivered to a group of patients" are currently being implemented in programs across the United States (Health Policy Brief, January 2012).

Private health insurers are beginning to arrange agreements with provider and hospital networks, which serve multiple goals including 1) empowering providers to be responsible for a patient's entire care pathway, 2) improving quality of care delivery at the population level, and 3) reducing unnecessary care delivery treatments and test to reduce costs. More efficient clinical teams will deliver targeted health outcomes at a lower cost (and thus higher value), creating cost savings for the organization. For instance, as stated in the Health Policy Brief in a January 2012 issue of Health Affairs "at least eight private health insurance plans have entered into ACO agreements with providers using a "shared risk" payment model. These arrangements make providers eligible for bonuses if they keep costs below a certain threshold but assess financial penalties against them if they exceed spending targets." For example, Blue Cross Blue Shield of Massachusetts (BCBS-MA), the Beth Israel Deaconess Physician Organization (BIDPO), and the Beth Israel Hospital Network entered into an Alternative Quality Contract (AQC) which, as described on the Blue Cross Blue Shield website, is a "modified global payment model, designed to encourage cost-effective and patient-centered care by paying participating physicians and hospitals for the quality, not the quantity of the care they deliver to patients." Organizationally, it will connect 1,800 physicians located in hospitals and community-based facilities in Eastern Massachusetts with 75,000 BCBS-MA members. The provider organization "accepts accountability for managing care within a specified annual budget and have an

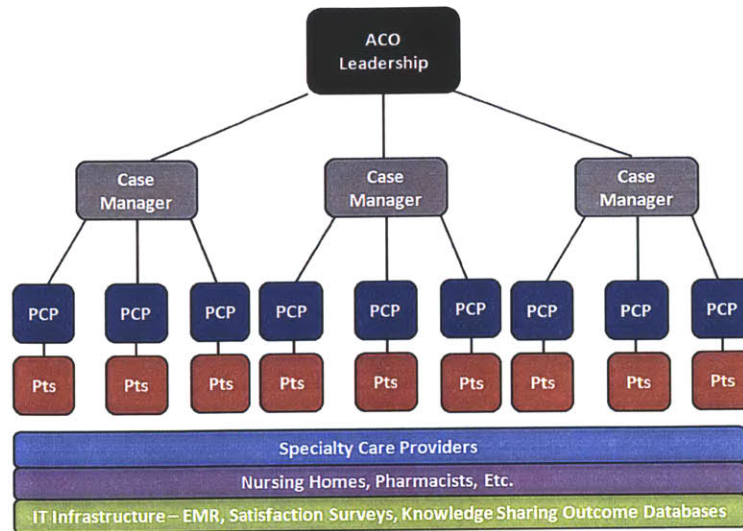
opportunity to earn significant financial rewards for meeting clinical performance targets” (Chernew et al, 2011). This new model will be responsible for meeting 32 specific quality measures to improve care delivery at the population-level and also improve preventative care delivery at the individual level.

There are several major advantages of this new approach that help reduce fragmentation in healthcare across the various stakeholders to help provide better quality of care and lower costs. Providers and payers are better aligned which will hopefully disincentivize one entity from obtaining an increase in revenue due to another entities increase in costs (Professor Ernst Berndt, Lecture 1, February 8th, 2012). Therefore, both providers networks and payers will “control cost soaring health insurance premiums by giving physicians an incentive to be more sparing in their use of expensive procedures such as sophisticated scans” (Kowalczk, January 2012). In addition, providers will attempt to reduce referrals to more expensive facilities and specialists and encourage them to rely on more community-based hospitals, such as the locations in Cape Cod, Needham, Milton, Merrimack Valley and Lawrence. The annual global payments issued under this agreement empower a patient’s primary care provider to manage the spectrum of care associated with a patient and encourage them to reduce unnecessary costs and reduce readmissions by keeping them healthy. Despite these significant advantages, there are some drawbacks to this new approach. As mentioned above, providers will minimize referrals of patients to the “best in class” yet costly specialists (Kowalczk, January 2012). In pilot programs, this has not been well-received by patients who wish to receive care from the #1 ranked specialist and has led to some difficulties in communications between patients and primary care physicians. In addition, this new model leads to some difficulties with coordination of care with patients who wish to receive care outside of their network. Finally, there are significant risks with these agreements getting too large and monopolies emerging, which will also As stated above, global payment models will serve to better coordinate care among primary care providers and hospitals. Therefore, as stated by the latest Medical Group Management Association figures reported in Medpage Today, it is not surprising that primary care and physician specialty physician practices are merging. Both entities will be incentivized to meet quality measures by providing more holistic, managed care, where collaboration across

previously not connected stakeholders will be a requirement in the new system. However, one potential consequence is that “ACOs could also produce higher prices as hospitals and physicians consolidate and become more powerful negotiators” (Health Policy Brief, January 2012). In essence, this could lead to ACOs commanding more market power, thus driving them to demand higher payments from private insurance organizations, which could increase costs and continue the pervasive over-spending problem in healthcare. be described below.

As stated by Chernew in a 2011 paper, “provider organizations in an Alternative Quality Contract agree to accept accountability for managing care within a specified annual budget and have an opportunity to earn significant financial rewards for meeting clinical performance targets.” However, it remains unclear the appropriate mechanism to allocate this annual global payment among the diverse stakeholders. In future work, I would like to look at investigating and architecting ACO models in the future healthcare system. To better architect new business models and incentive structures for the civilian sector, I propose performing case studies, interviews, and other qualitative analysis tools to study the various stakeholders. I would like to further understand their unmet needs and design alternative business and incentive structures for these ACOs. Also I would like to perform quantitative analysis using real options analysis and flexible design models as discussed by Richard de Neufville and Stefan Scholtes in their 2011 book.

In addition, I would like to investigate new organizational models. For instance, it would be interesting to examine whether ACO leadership could empower case managers with an annual budget to manage a specific panel of patients. With a specific budget, the case manager will work with a specific subset of primary care providers and form a “care team” with each patient’s primary care physician. By working directly with each patient’s PCP, they can design a care plan that keeps the patient healthy, provide preventive care, track quality of care through specific metrics, and reduce readmission rates. This proposed model is highlighted in Figure 26. Ideally, this case manager will have a clinical background, perhaps a nurse or nurse practitioner, so that they are both knowledgeable and can speak the same language as the providers.



**Figure 26: Proposed Case Manager Focused Methodology for Allocation of Annual Global Payment**

As stated above, each case manager could potentially be allocated a dedicated budget to care for their panel of patients. They will use this budget to “divide up” among the patients and their specific care needs. The providers and case managers will receive a certain percentage of the shared savings or bonus if they are under their allocated budget or will be “penalized” if they are over budget. Based on computer algorithms, each case manager will be given a diverse subset of patients according to age, gender, home location, race, and current health status. However, this process will not be perfect, so to ensure that patients in need of care do indeed receive the appropriate attention, I propose investigating the idea of instituting reinsurance. The idea of reinsurance is described by Chernew as “a separate insurance policy that protects them [providers] in the event of high-cost cases, in which a patient’s medical spending exceeds a specific threshold, such as \$100,000. The policy value generally covers 70–90 percent of the cost above the threshold. Groups can purchase reinsurance coverage from Blue Cross or another reinsurer” (Chernew et al, 2011).

The IT infrastructure will also be a critical component to study in this proposed model, which will specifically include an electronic medical record (EMR) system, online patient satisfaction survey, knowledge sharing outcomes database, telehealth VTC and mobile infrastructure, and scheduling system. Outcome measures could potentially be pulled directly from each patient’s EMR and computer algorithms will measure outcomes across each case manager’s panel of patients. Case managers that meet outcome measures goals as dictated by

ACO leadership could be entitled to receive the aforementioned bonus in the shared saving program. Providers could potentially be assessed based on these same outcome measures and will also be tied to the same policy that only allows them to receive their shared savings bonus if they have met outcome measure goal of their patients. It will be important to examine and propose an IT infrastructure these new models. During conversations with CIOs at large academic medical centers, they have also discussed telehealth being an essential component of their ACO models, but do not know how to effectively architect it. Leveraging the authors findings from the Military Health System, future research should investigate how to architect telehealth in the civilian sector in this newly proposed ACO models.

**Appendix A: Army Behavioral Health Enterprise Stakeholders**

Appendix A below outlines the Army Behavioral Health Enterprise Stakeholders. Specifically, it outlines the values they expect from the Army Enterprise and the values they contribute to the enterprise referenced in Chapter 2.

Stakeholder	Value Expected From The Enterprise	Value Contributed to the Enterprise
Active Duty Service member	<ul style="list-style-type: none"> <li>• <u>Support from chain of command</u>: “Support from their chain of command for referral into the system” (Scott, 2012)</li> <li>• <u>Reduce stigma</u>: “Reduce stigma to freely seeking behavioral health care”. (Scott, 2012)</li> <li>• <u>Appearance of mental strengthen</u>: “Do not want to be considered weak by their peers and their leaders.” (Scott, 2012)</li> <li>• <u>Compassion army leaders</u>: “Army leaders who understand that behavioral health challenges are real and potentially debilitating will encourage their soldiers to find providers who can help them get back to 100%, so that they are individually ready for deployment, thus increasing the unit's deployment capability.” (Scott, 2012)</li> <li>• <u>Accessible and responsive BH care</u>: “Behavioral health care that is both accessible and responsive to their needs.”</li> <li>• <u>Resilience</u>: “Behavioral health options that will allow them to return to duty in a fully mission capable condition.” (Scott, 2012)</li> <li>• <u>Effective and timely treatment</u>: “Need for treatment that is both effective and timely” (Scott, 2012)</li> <li>• <u>Relationship with providers</u>: “Currently, the relationship between soldiers and providers is severed. Partially due to long wait times and access to care, but most because marines and unit leaders feel that providers do not understand the military culture.” (Ippolito, 2012)</li> <li>• <u>Peer to peer support</u>: “Along with small unit</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Mission ready service member</u> (DoD, 2012)</li> <li>• <u>Resilient service member</u>: “fit and healthy fighting force.” (DoD, 2012)</li> <li>• <u>Commitment to USA and military</u>: “Core values of duty, honor and commitment to our nation” (DoD, 2012)</li> <li>• <u>Courage and sacrifice</u>: “Values that begin with an ethic of healing and extend to the highest values of personal courage and sacrifice for a larger purpose.” (DoD, 2012)</li> </ul>



	<p>leadership, support and recognition of behavioral health warning signs from peers and members of your unit was another first line of defense.” (Ippolito, 2012)</p> <ul style="list-style-type: none"> <li>• <u>Continuity of Care</u>: “Soldiers pointed out that few stakeholders the BH system communicate across stakeholder groups making continuity of care difficult, especially with regard to medication management.” (Ippolito, 2012)</li> <li>• <u>Reduction in family stressors</u>: “Both marines and providers indicated that one of the most significant drivers of stress in theater was attributed to dealing with family stressors back at home.” (Ippolito, 2012)</li> <li>• <u>Quality of Life</u>: “In general, several providers and officers felt that marines quality of life with respect to sleep, which lead to overuse of energy drinks and medication, is impacted from the pace of deployments.” (Ippolito, 2012)</li> <li>• <u>Focus on mission</u>: “Mission readiness is a critical component of our role. However, they often feel like they are piling on extra behavioral health duties.” (Ippolito, 2012)</li> </ul>	
<p>Reserve Component/National Guard (RC/NG) Service member</p>	<ul style="list-style-type: none"> <li>• <u>Accessible healthcare outside of deployment</u>: “Guard only receive care through TRICARE before and after deployments (180 days)” and “Want care closer to their homes...they are often 2-3 hours from military health care facilities... they are trying to proliferate telehealth in this type of system” (Ippolito, 2012)</li> <li>• <u>Appropriate and adequate training</u>: “They are not full time soldiers...learn on the fly” – RC/NG value proper training before deployment” (Ippolito, 2012)</li> <li>• <u>Standard healthcare services</u>: “The delivery care system that serves them [RC/NG] varies from state to state...we do treat them different, there is a different standard.” (they would like to have</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Mission ready service member</u> (DoD, 2012)</li> <li>• <u>Resilient service member</u>: “fit and healthy fighting force.” (DoD, 2012)</li> <li>• <u>Commitment to USA and military</u>: “Core values of duty, honor and commitment to our nation” (DoD, 2012)</li> <li>• <u>Courage and sacrifice</u>: “Values that begin with an ethic of healing and extend to the highest values of</li> </ul>

	<p>consistent care across the enterprise) (Ippolito, 2012)</p> <ul style="list-style-type: none"> <li>• <u>Embedded BH assets</u>: “NG/RC want BH assets based in their units” (Ippolito, 2012)</li> <li>• <u>Job Opportunities</u>: “They are often unemployed...they want assistance finding jobs” (Ippolito, 2012)</li> </ul>	<p>personal courage and sacrifice for a larger purpose.” (DoD, 2012)</p>
<p>Families</p>	<ul style="list-style-type: none"> <li>• <u>Education of BH options</u>: “Education to access the system is one challenge with reservists. A lot of reserve families don’t have a clear understanding of the system as do the active duty. Reserve families do not know where to go. They are trying to provide services to reserve families, but they are so accustomed to doing their own thing. There is no connection between their life as a reservists soldier vs. active duty soldier.”</li> <li>• <u>Standard information gateways</u>: “As one of our recent interviewees stated “there are so many services that families aren’t accessing because they don’t know about them.” and “Family Readiness Support Assistants are one example of a best practice currently in place that assists command in disseminating all the resources to families.” Another interviewee stated “FRSAs serve as a one stop shop to disseminate information to families.”” (Ippolito, 2012)</li> <li>• <u>Reduce stress</u>: “There is a lot of activity and stress within the family. It explains some of the peaks and valleys. The rates are increasing over the years. Part of it is from repeated deployment.”</li> <li>• <u>Consistent and standard care delivery</u>: “Care for families is not consistent across the enterprise. This is a problem when families are moving every 2-3 years and there are different procedures and names for services that vary from base to base.”</li> <li>• <u>Failure of service members to</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Maintain healthy, resilient families</u>: “support the larger DoD effort to ensure that families and the military community are resilient and prepared for the stress of deployment.” (DoD, 2012)</li> </ul>

communicate information to their families: “The marine is not telling his wife. Wife is often not at the brief...The families that we don’t worry about – are the spouses that show up for the briefs.” (Ippolito, 2012)

- Importance of education surrounding life skills: “I think that the families go through a lot when they are gone. Being instant single parents. They are on their own and they used to that lifestyle. There should be more counseling provided to family unit – not just the marine. And not do you want it – it should be mandatory that you see it together with your family... Before I left, I tried to be involved with the finances. Gradually, she would start sliding in more and more. When you come back, you need to let the family do their thing. If you throw a monkey wrench into that well-oiled machine, you need to gradually bring that thing back into it. This is where conflicts start to happen if you don’t do it slowly. We don’t teach this. We need to teach this. When I went on a deployment, my wife was not dependent – when I came back – she was independent.” (Ippolito, 2012)
- Different types of services that meet families diverse needs: “different services that capture different populations. This creates separate access points of care that are tailored to meet the diverse needs of families.”
- Adequate rear detachment command support: “one of the main charges of the rear D commander is to take care of families. So if a rear D commander is weak, this really hurts the families in the long run” (Ippolito, 2012)
- Adequate services to meet family’s needs: “we have found several recurring themes come up in our interviews regarding the

	<p>needs of families, which include large levels of divorce and infidelity in families, the need for services for children of the “lost generation” (i.e. children whose parents started being deployed when they were young and now have grown up without a parent around due to multiple deployments over the past 10 years or so), and families of multiple deployments, hesitation of family members to seek services for fear of impacting SM career.” (Ippolito, 2012)</p> <ul style="list-style-type: none"> <li>• <u>Core funding for family programs:</u> “family programs not being core funded” (Ippolito, 2012)</li> </ul>	
<b>Force Command (FORSCOM) Stakeholders</b>		
Chain of Command	<ul style="list-style-type: none"> <li>• <u>Small unit leadership:</u> “Both commanders and small unit leaders highlighted the importance and emphasis placed on small unit leadership. They noted that the expectation was for the NCOs and junior leaders closest to the service member to surface issues and serve as the first point of care for the Marine. They shared stories on how small unit leadership had enabled them to prevent adverse events. At the same time, they emphasized the need for top-down leadership guidance, engagement, and the presence of information pathways to ensure that issues surfaced by small unit leadership reached senior leadership. “The role of small unit leadership – you can catch these mistakes.” (Ippolito, 2012)</li> <li>• <u>Preventing advancement too quickly:</u> “Concerns were expressed about the quick advancement of leaders in the current state of affairs. One interviewee stated: “I am concerned about the leadership. Because of wartime, we have advanced folks a lot quicker than we used to.” (Ippolito, 2012)</li> <li>• <u>Timely course of treatment:</u> “timely</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Duty, Honor, and Commitment:</u> “Core values of duty, honor and commitment to our nation. A leadership which promotes an ethos of teamwork and loyalty to mission and members of our team— no one gets left behind” (DoD, 2012)</li> <li>• <u>Execution of mission:</u> “the chain of command is the agent in the system responsible for execution of the Army’s war fighting mission, and adherence to unit deployability and readiness standards.” (Scott, 2012)</li> </ul>

	<p>courses of treatment that return soldiers to a deployable condition and usable information regarding the disposition/fitness for duty of the soldiers who remain within care.” (Scott, 2012)</p> <ul style="list-style-type: none"> <li>• <u>Effective information exchange with providers:</u> “effective information exchange with both primary and specialty care providers regarding the soldiers for which they are responsible and in trust to execute difficult and dangerous training and combat missions.” (Scott, 2012)</li> </ul>	
Chaplain Corps	<ul style="list-style-type: none"> <li>• <u>Embedded within the unit:</u> “The chaplains expressed this as a critical aspect of their role to the marines. They referred to their bread and butter care as “deck plate ministry” by building relationships and repaire with marines by providing religiously-neutral counseling for 5-10 people in their workplace. As one chaplain stated “Deck plate ministry is absolutely critical by its nature, we are the helping professionals at the lowest echelon... It helps command feel comfortable with you. We have been deployed with them. Marine will also come up to us and it is pretty easy to approach us.... We are an advocate. We often provide a back door for the system to autocorrect. We advocate for the people in the unit.” Because they are embedded within the unit, they also deploy with the unit and earn their respect and trust.” (Ippolito, 2012)</li> <li>• <u>Importance of Confidentiality:</u> “As the spiritual asset of the unit, conversations with the chaplain are completely confidential, which also allows marines to easily approach them without fear of information reaching their command.” (Ippolito, 2012)</li> <li>• <u>Need for more BH assets at the unit level:</u> “The chaplains expressed concerns that</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Providing spiritual guidance:</u> “Chaplains are assigned to each Division Group with the mission of ensuring the spiritual fitness of their marines while they are deployed and to marines and their families while in garrison.”</li> <li>• <u>Confidential, non-clinical counseling:</u> “chaplains have a guaranteed confidentiality in the conduct of nonclinical counseling. Chaplains may not advise commanders for primary care physicians of that which is revealed to them and counseling by their soldiers without the explicit permission of the soldiers. A chaplain at site A summed this up best in his statement that, “if a soldier</li> </ul>

	<p>they are overwhelmed and there is a direct need for more BH assets in the unit. As one chaplain stated “We need more mental health resources organic to the unit. I would love to have a closer relationship with those guys.” In addition, the chaplains themselves would also like to be seen more as providers of care.” (Ippolito, 2012)</p> <ul style="list-style-type: none"> <li>• <u>Need more training for chaplains:</u> “Due to the pace of deployments, they have not been able to train chaplains as much as they would like or invest time and resources into academic work to study BH from the spiritual perspective.” (Ippolito, 2012)</li> <li>• <u>Trust with command:</u> “For this reason, there is an implicit trust between the chain of command and the chaplains, and likewise between soldiers and chaplains. This trust stems from the chaplain’s co-location in “living, eating, and going on missions” with soldiers and their commanders.” (Scott, 2012)</li> </ul>	<p>doesn't know you and doesn't trust you, then he won't talk to you.” (Scott, 2012)</p>
FRSA/FRG	<ul style="list-style-type: none"> <li>• <u>Maintaining unit engagement:</u> “the morale and the command climate on the unit” (Ippolito, 2012)</li> <li>• <u>Time to build relationship and trust with families:</u> “In her first week, there were 6 casualties during her first week. She had to jump in and it didn’t stop. Every time her phone she was nervous. She didn’t have the time to build the relationship.” (Ippolito, 2012)</li> <li>• <u>Navigating effectively through marriage and child issues within the unit:</u> “Childcare is a huge issue... They need to quit getting married so young. This would help out so much. AMEN to that.” (Ippolito, 2012)</li> <li>• <u>Service members communicating effectively with spouses:</u> “communication between soldier and spouse prior to leaving. A lot of the phone calls they got</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Serve as a liaison between command and families</u> (Ippolito, 2012)</li> <li>• <u>Maintaining accurate contact information for families</u> (Ippolito, 2012)</li> </ul>

from spouses – their soldiers were not communicating to them about things.” (Ippolito, 2012)

- Family members attending pre-deployment briefings: “communication between soldier and spouse prior to leaving. A lot of the phone calls they got from spouses – their soldiers were not communicating to them about things. You can’t mandate that the family comes. They don’t know. Many of them had pre-deployment briefings.” (Ippolito, 2012)
- Maintaining relationship and trust of command: “It is hard to establish that relationship with commands? It depends on the personality.” (Ippolito, 2012)
- Consistency across the bases: “It is not consistent across the different bases. It needs to be mandated but you need to be flexible to meet the needs of that commander’s units.... you need to have some things across the board with some flexibility across the situation” (Ippolito, 2012)
- Services available for service members and their family: “They have no services together for the soldier and wife” (Ippolito, 2012)
- Meeting BH demand: “The Army has done great – but the system is there but it is not meeting the demand. The demand has exceeded. She is watching long term marriages fall apart. She has a family that has only been in the same place for 4 out of the past 10 years together. I have been married 26 years. I struggle right before he leaves, right before he comes back. She asks herself – why does she do that? The issue is soldier coming back to the household. Soldier has acquired all sorts of mannerisms and all sort of personalities. The soldier is going to sleep at 8Pm. Younger families – stress of the new

	<p>families. Soldiers need to have priority but the kids seems to be getting short changed. The care is so inconvenient their needs are not being met. Our base has had a marked increase in BH needs. She is on the school board and she has seen a lot more issues. These kids are being born straight into war. They have one family member for a whole year. It is not the rule as opposed to the exception.” (Ippolito, 2012)</p> <ul style="list-style-type: none"> <li>• <u>Programs working together:</u> “The programs and services are in place – it is getting them to work together cohesively and this is what is pushing families away. The systems are tapped out. There is not enough to meet the demand.” (Ippolito, 2012)</li> </ul>	
Primary Care	<ul style="list-style-type: none"> <li>• <u>Maintaining relationships with command:</u> “Relationships with the chain of command, the chaplain corps, the unit psychiatric provider, and the family readiness support assistant are generally found to be easily formed due to close proximity and shared strategic objectives” (Scott, 2012).</li> <li>• <u>Maintaining relationships with medical providers:</u> “Relationships with institutional medical providers and MEDCOM and IMCOM are more difficult since they are separated in mission and space.” (Scott, 2012)</li> <li>• <u>Effective AHLTA system:</u> “Automated means of information distribution such as AHLTA allow the distribution of electronic medical records among all and post providers; however, limitations in this system reduce the fidelity of information transfer by this means.” (Scott, 2012)</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Providing front line care</u> (Scott, 2012)</li> <li>• <u>Effective information exchange with other stakeholders within the system.</u> (Scott, 2012)</li> </ul>
Unit Psych Provider	<ul style="list-style-type: none"> <li>• <u>Maintaining relationships with command</u></li> <li>• <u>Need adequate time to provide care and access to patient populations.”</u> BCT providers remarked that the bulk of their</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Provide specialty care provider _____ for behavioral health available to soldiers</u></li> </ul>



	time is occupied by staff functions and travel to and from unit areas.” (Scott, 2012)	<u>within FORSCOM units.</u> (Scott, 2012)
<b>Installation Command (IMCOM) Stakeholders</b>		
ASAP	<ul style="list-style-type: none"> <li>• <u>Adequate pay and compensation:</u> “We talk to our peers and they found out we aren’t getting paid they want to. Pay is not consistent across the enterprise.” (Site visit notes)</li> <li>• <u>Access to MEDCOM:</u> ASAP was removed from MEDCOM and placed in IMCOM which has made their job more difficult.</li> <li>• <u>Appropriate and standard accounting procedures:</u> “They are not under any RVU system under IMCOM” (Site visit notes)</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Enhance service member readiness:</u> “Strengthen the fighting force and enhance readiness through drug and alcohol education and prevention programs” (Scott, 2012)</li> <li>• <u>Reduce risk:</u> “installation-level risk reduction” (Scott, 2012)</li> </ul>
FAP	<ul style="list-style-type: none"> <li>• <u>Strong cooperation with stakeholders:</u> “needs cooperation of and information from the Directorate of Emergency Services for notification of serious events, the Chain of Command for information on soldier history as it relates to family matters and time for soldiers to attend training.” (Scott, 2012)</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Provides information designed to support strong, self-reliant families</u> (Scott, 2012)</li> <li>• <u>Enhance coping skills.</u> “The program educates families about child and spouse abuse, as well as abuse prevention, education, intervention and treatment. Other programs include new parent support, victim advocate, sexual assault prevention and response and parenting classes.” (Scott, 2012)</li> </ul>
MFLC	<ul style="list-style-type: none"> <li>• <u>Maintaining confidentiality:</u> “This is outside of the medical care. They are not recorded... they are on-demand and they don’t keep notes. They can’t tell command who they have seen.” (Ippolito, 2012)</li> <li>• <u>Rotating every 3 months:</u> “They attract</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Prevent family distress by providing education and information:</u> “focus on family dynamics, parenting strategies,</li> </ul>

	<p>empty nesters who like the idea of travel – 3-6 months – they attract the right type of people.” (Ippolito, 2012)</p> <ul style="list-style-type: none"> <li>• <u>Meeting in non-clinical settings:</u> “They put people at ease. It was helpful as a provider and more of an individualized focus... They don’t have the jadedness of the clinic. They like their jobs.” (Ippolito, 2012)</li> <li>• <u>Access to service members and families:</u> “Due to the MFLC’s reporting chain and confidentiality, they only have one real need – access to the soldiers.” (Scott, 2012)</li> </ul>	<p>available support services, the effects of stress, and positive coping mechanisms.” (DoD, 2012)</p> <ul style="list-style-type: none"> <li>• <u>Provide anonymous and confidential assistance to soldiers and their families:</u> “focus on problem solving issues resulting from deployment, reunions, reintegration, and/or other times of change.” (DoD, 2012)</li> </ul>
<b>Medical Command (MEDCOM)</b>		
MTF Inpatient Wards	<ul style="list-style-type: none"> <li>• <u>Meeting supply of providers with demand of patients:</u> “needs a cadre of providers and a number of operating beds appropriate for the demand of the population on the site” (Scott, 2012)</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Provide intensive psychotherapy and supervision:</u> “Provide care to those patients identified as homicidal, suicidal, or psychotic by the triage function of the enterprise” (Scott, 2012)</li> </ul>
Outpatient Care Clinics	<ul style="list-style-type: none"> <li>• <u>Maintaining communications with commanders:</u> “They have multiple clinics – it is confusing to command when there are so many program. Our goal is to educate and communicate with commands.” (Ippolito, 2012)</li> <li>• <u>Improve ability to provide systems care:</u> “Some of the challenges: ASAP no longer works for Madigan (they were for IMCOM) and so it means that they have a parallel command they work to. This is its own entity under IMCOM – this greatly influences our ability to provide systems of care.” (Ippolito, 2012)</li> <li>• <u>Coordination among BH services:</u> “People are resistant because they may longer be</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Triage and assessment of service member:</u> “These service members are either suicidal, homicidal, psychotic, or routine patients. This is essential so that the medical command may adhere to access to care standards and more importantly to ensure that non–routine patients receive the requisite care immediately</li> </ul>

	<p>needed or they will be assumed under someone else... The last point of resistance – all this infighting and derision is wasted energy and it doesn't gain us anything." (Ippolito, 2012)</p> <ul style="list-style-type: none"> <li>• <u>Maintaining HIPAA:</u> "Barriers associated with communicating information due to uncertainty with HIPAA are an issue. For instance, one unit leader stated "It depends on the relationship you create with the provider. It can be very frustrating. I have a in your face type of mentality. As a CO, you need to have access to info. HIPAA is an issue. It is on an individual basis if the provider gets it." (Ippolito, 2012)</li> <li>• <u>Effective Medication management:</u> "Once a patients comes and sees me – they will come see me for panic attacks. We are pretty proactive about getting medications. I have had prolonged exposure. Now that it is more relegated to deployment wellness. I am not doing this as much. I like to keep a close eye on people and give them medication at the right level" (Ippolito, 2012)</li> <li>• <u>Reducing provider attrition:</u> "Demand is higher. The number of providers is almost high enough to meet the demand. They are doing better with attrition (always a problem. We had one psychologists for the whole division, now we have one psychologists for the brigade." (Ippolito, 2012)</li> <li>• <u>More effective performance measures:</u> "What the command wants to know often changes – I think he doesn't know what the key measures. It depends on the command. He reports to two chains for command hospital chain of command (MEDCOM) and first corp" (Ippolito, 2012)</li> <li>• <u>Reducing malingers:</u> "IT is a small population but still he worries about the</li> </ul>	<p>upon identification." (Scott, 2012)</p> <ul style="list-style-type: none"> <li>• <u>Execute therapy for service members:</u> "Provide care for service members who are identified as routine. A need for the outpatient clinics, identified in the site visit, is for a cadre of providers appropriate for the patient load for which they must provide care" (Scott, 2012)</li> <li>• <u>Maintain service members within the network:</u> "When providers are insufficient to meet the demands of the patient population, patients must be referred to the TRICARE network, which may provide behavioral health services in civilian clinics, but at a greater monetary cost to the Army." (Scott, 2012)</li> </ul>
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	<p>people that are not cultural malingering – he is more worried about the people that go to the media and say – if you have been to Iraq – you must have PTSD. There has been this shift – the biggest headache for the commander – is the guy who is always sick – and we are giving this persona blank slate.” (Ippolito, 2012)</p> <ul style="list-style-type: none"> <li>• <u>Reducing no-show rate:</u> “Also our no show rate – is right around 20%? This is pretty standard across the enterprise. The army is looking at policies to improve the no show rate.” (Ippolito, 2012)</li> <li>• Reducing complexity of issues due to multiple deployments: “Multiple deployments. With these multiple deployments, the issues become more complex. He has been deployed three times and it gets harder and harder. People don’t recognize that they have a problem until the next deployment comes up. So then they go and then it accumulates and increases the complexity of the cases they were dealing with.” (Ippolito, 2012)</li> <li>• <u>Standardized risk assessments:</u> “Also they have standardized their risk assessment so they are all speaking the same language with risk assessment. This was a huge challenge. You may not always agree, but the language is similar.” (Ippolito, 2012)</li> <li>• <u>Improved ability to communicate best practices:</u> “One of the enterprise challenges – communicating best practices. MEDCOM is forming a BH cell to track this. Unfortunately right now they are more reactive. They don’t have someone really dedicated to best practice.” (Ippolito, 2012)</li> <li>• <u>Improving peer to peer support:</u> “Most of the suicides that are prevented – happen at the peer level. It is critical to educating the peers at that level.” (Ippolito, 2012)</li> </ul>	
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	<ul style="list-style-type: none"> <li>• <u>Better management of surges</u>: “How do you manage the surges? We rob Peter to pay Paul. We shut down certain services. we quit providing services to retirees and their families. He took away non-prescribing personnel to go do screenings. They try to rely on region and they are pulling providers to support the region. We hired folks to support he surges to send them for 90 days. There isn’t a really good surge planning. They did leverage Walter Reed and European command – they sent people out and they did VTC.”</li> <li>• <u>Regional/central or credentialing/privileging</u>: “regional credentialing or one central credentialing body. This was a huge issue with credentialing when trying to staff. If you are practicing at a federal facility, it doesn’t matter when you have a state license – you can practice in Colorado when you practice on a federal facility. Why can’t we do this with credentialing?”</li> <li>• <u>Standardizing policies</u>: Surrounding medication management, consent, and in and out processing (Ippolito, 2012)</li> </ul>	
Warrior Transition Unit	<ul style="list-style-type: none"> <li>• <u>More integration with BH</u>: 60% of the WTB folks have a BH components – and one of the primary reasons they are in the WTB is BH. WTU – this is a another area where they have done integration work – they have placed social work. This is a problem. You end up with two different standards.” (Ippolito, 2012)</li> <li>• <u>Need a longer timeframe for which they expect to have soldiers assigned</u> (Scott, 2012)</li> <li>• <u>Needs the cooperation of medical providers to allow WTU patient</u>: “allows service members to bypass long queues for medical services.” (Scott, 2012)</li> <li>• <u>Requires adequate resources</u>: “ enhanced facilities for housing soldiers who live on</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Serves as an intensive case management activity</u>: “serves as an intensive case management activity for service members assigned.” (Scott, 2012)</li> </ul>

	<p><u>the installation</u>, and a large staff capable of maintaining contact with soldiers who do not live on the installation.” (Scott, 2012)</p>	
<b>TRICARE Network</b>		
<p>Community Counseling, inpatient, and outpatient care providers</p>	<ul style="list-style-type: none"> <li>• This is a gap in our research</li> </ul>	<ul style="list-style-type: none"> <li>• This is a gap in our research</li> </ul>

## Appendix B: Telebehavioral Health Literature

Appendix B presents a summary of Telebehavioral Health Literature referenced in Chapter 3.

Author/Year	Outcomes
De Las Cuevas et al, 2006	<ul style="list-style-type: none"> <li>Completed 534 telepsychiatry consultations and 522 face to face consultations (F2FC)</li> <li>Evaluated efficacy by comparing Clinical Global Impressions-Severity of Illness (CGI-S) and -Improvement (CGI-I) scales and Global Indexes (GSI, PSDI, and PST) to the first visit</li> <li>“Study demonstrated that telepsychiatry treatment through videoconference has equivalent efficacy to F2FC psychiatric treatment.”</li> </ul>
Fortney et al, 2007	<ul style="list-style-type: none"> <li>Evaluated a telemedicine-based collaborative care model adapted for small community-based primary care clinics without on-site psychiatrists with 395 patients</li> <li>Examined the following measures: Medication adherence, treatment response, remission, health status, health-related quality of life, and treatment satisfaction</li> <li>“Collaborative care can be successfully adapted for primary care clinics without on-site psychiatrists using telemedicine technologies.”</li> </ul>
Frueh et al, 2007	<ul style="list-style-type: none"> <li>Compared the efficacy of telepsychiatry and face to face treatment of PTSD using cognitive behavioral therapy (CBT) in weekly treatments</li> <li>No group differences were found on clinical outcomes, satisfaction with treatment ratings was similar in both groups, and attendance and drop-out were similar in both groups</li> <li>“Results provide preliminary support for the use of telepsychiatry in the treatment of PTSD to improve access to care.”</li> </ul>
Brady, 2002	<ul style="list-style-type: none"> <li>Performed an analysis of costs associated with the beneficiary, the medical system, and the military organization utilized to access mental healthcare: civilian HMO network, patient travel to military facility, military providers travel to remote clinics, and telemental health.</li> <li>“Utilization of telemental health technologies is comparable in costs to other methods of mental health care delivery. The benefits of TMH are realized at many levels through direct care or care to active duty personnel and their families.”</li> </ul>
Brady and Melcer, 2005	<ul style="list-style-type: none"> <li>Reviewed telemental health care (TMHC) and face-to-face care (FTFC) of service members records retrospectively</li> <li>Global assessment of functioning was significantly less for FTFC compared to TMHC</li> <li>“No significant differences between the groups in the number of laboratories, self-help recommendations, selected mental status elements, or the number of patients prescribed two or more psychotropic medications. Rate of full compliance with the medication</li> </ul>

	<p>plan and follow-up appointments was better for TMHC. Improved compliance, unique interpersonal processes of care via TMH, and slightly shorter times to next follow-up appointment were the chief contributors.”</p>
Gros et al, 2011	<ul style="list-style-type: none"> <li>• Investigated the effectiveness of 12-session exposure therapy delivered either via telehealth (n=62) or in-person (n=27) with veterans with PTSD.</li> <li>• Demonstrated that “exposure therapy delivered via telehealth was effective in reducing symptoms of PTSD, anxiety, depression, and stress...Exposure therapy delivered via telehealth was less effective than exposure therapy delivered in person.”</li> </ul>
Jong, 2004	<ul style="list-style-type: none"> <li>• Compared the cost of paying for a patient to travel out of a remote community for suicide assessment vs. cost of providing assessment over videoconference.</li> <li>• “Use of videoconferencing for mental health assessment for 71 patients in a remote northern community saved the government \$140,088. Patients and health professionals were satisfied with mental health assessments via videoconferencing.”</li> </ul>
Modai et al, 2006	<ul style="list-style-type: none"> <li>• Compared ambulatory and hospitalization costs, treatment adherence, patient and physician satisfaction, and treatment safety between telepsychiatry and in-person treatments in remote communities.</li> <li>• Patients and physicians were satisfied with telepsychiatry and considered it safe, despite it being more expensive and tended to have higher hospitalization rates compared to face to face care.</li> <li>• “Adherence ratios before and during telepsychiatry treatment were similar, but were twice as high versus the comparison group.”</li> </ul>
	<ul style="list-style-type: none"> <li>• Provided services to 186 inmates who received mental health services (36 via telepsychology, 50 via face-to-face psychology, 50 via telepsychiatry, and 50 via face-to-face psychiatry)</li> <li>• “Results indicate no significant differences in inmates’ perceptions of the work alliance with the mental health professional, postsession mood, or overall satisfaction with services when telemental health and face-to-face modalities were compared within each type of mental health service.”</li> </ul>
Morland et al, 2011	<ul style="list-style-type: none"> <li>• “Report clinical findings from the pilot cohort of the first prospective, noninferiority-designed randomized clinical trial (n=13) evaluating the clinical outcomes of delivering a cognitive-behavioral group intervention for posttraumatic stress disorder (PTSD), cognitive processing therapy (CPT), via video teleconferencing (VT) compared to the in-person modality.”</li> <li>• Both VTC and face to face demonstrated a decrease in PTSD symptoms and there was no significant difference between clinical and outcome variable, which include high levels of treatment credibility, high satisfaction with care, high levels of homework adherence, and lower</li> </ul>



	levels treatment dropout compared to other clinical trials.
Morland et al, 2010	<ul style="list-style-type: none"> <li>• Conducted a randomized control trial (n=125) of veterans and evaluated according to DSM criteria and anger difficulties based on in person or video teleconferencing treatment</li> <li>• Demonstrated significant and “clinically meaningful” reductions in anger symptoms and no significant difference between groups with the process variables of attritions, adherence, satisfaction, and treatment expectancy across both groups. The in person group reported higher group therapy alliance.</li> </ul>
Niles et al, 2011	<ul style="list-style-type: none"> <li>• Examined two telehealth interventions (mindfulness and psychoeducation) to address symptoms of PTSD in veterans (n=24)</li> <li>• Concluded that “(1) Telehealth appears to be a feasible mode for</li> <li>• delivery of PTSD treatment for veterans; (2) Veterans with PTSD are able to tolerate and report high satisfaction with a brief mindfulness intervention; (3) Participation in the mindfulness intervention is associated with a temporary reduction in PTSD symptoms; and (4) A brief mindfulness treatment may not be of adequate intensity to sustain effects on PTSD symptoms.”</li> </ul>
O’Reilly et al, 2007	<ul style="list-style-type: none"> <li>• Examined patients (n=495) split between two groups that received either face to face treatment or telepsychiatry treatment in rural areas</li> <li>• “Psychiatric consultation and follow-up delivered by telepsychiatry produced clinical outcomes that were equivalent to those achieved when the service was provided face to face. Patients in the two groups expressed similar levels of satisfaction with service. An analysis limited to the cost of providing the clinical service indicated that telepsychiatry was at least 10% less expensive per patient than service provided face to face.”</li> </ul>
Pyne et al, 2010	<ul style="list-style-type: none"> <li>• Examined the cost-effectiveness of a rural telemedicine-based collaborative care depression intervention with veterans (n=335) utilizing a virtual care team consisting of a nurse depression case manager, clinical pharmacist, and psychiatrist.</li> <li>• “In rural settings, a telemedicine-based collaborative care intervention for depression is effective and expensive. The mean base case result was \$85 634/QALY, which is greater than cost per QALY ratios reported for other, mostly urban, depression collaborative care interventions.”</li> </ul>
Ruskin et al, 2004	<ul style="list-style-type: none"> <li>• Completed a randomized, controlled trial of depressed veterans (n=119) referred for outpatient treatment and were randomly assigned to either remote treatment utilizing telepsychiatry or in person treatment</li> <li>• Depression rating scores, adherence rates to appointments and medications, or dropout rates or patients’ ratings of satisfaction did not differ across the two different groups. Telepsychiatry was more expensive than in person treatments, except when the psychiatrist had to travel to a remote clinic more than 22 miles away from the medical</li> </ul>

	<p>center</p> <ul style="list-style-type: none"> <li>• “Remote treatment of depression by means of telepsychiatry and in-person treatment of depression have comparable outcomes and equivalent levels of patient adherence, patient satisfaction, and health care cost.”</li> </ul>
Shore et al, 2007	<ul style="list-style-type: none"> <li>• Examined the reliability of the Structured Clinical Interview for DSM-III-R (SCID) in the administration of psychiatric assessments by VTC compared to FTFC within a rural American Indian population (n=53)</li> <li>• “With the exception of past-year substance dependence and abuse/dependence combined, there were no significant differences between face-to-face and videoconference administration.”</li> </ul>
Shore et al, 2012	<ul style="list-style-type: none"> <li>• Examined chart and electronic medical records of American Indian and Alaska Native veterans (n=85) faced with PTSD who received treatment at two rural telemental health clinics.</li> <li>• “After intake, patients’ use of any health services (both general medical and mental health services) significantly increased, as did the proportion receiving psychotropic medication... We also observed a nonsignificant trend toward lower rates of hospitalization among these patients and fewer hospitalizations per patient. We believe that this trend is an indication of better assessment, referral, and linkage to the larger VA system and resources.”</li> </ul>

### **Appendix C: Enablers and Challenges in the Current State of RMCs**

Appendix C summarizes the enablers and challenges in the current state of Regional Medical Commands discussed in Chapter 4.

#### **Enablers Expressed During Interviews across the Regional Medical Commands**

<b>Enabler</b>	<b>Region 1</b>	<b>Region 2</b>	<b>Region 3</b>	<b>Region 4</b>	<b>Region 5</b>
Patient Surveys		“Overwhelmingly positive results from surveys”	“Patient satisfaction surveys are helpful. We found that 86% of soldiers would choose a TBH encounter again.”	“We do ask for feedback about how they the experience the virtual process”	
Administrative and Clinical Coordinator (MSAs)	“Admin and clinical coordinator interface to make sure information is up and running. Places that are busy have both.”	“Dedicating staff to schedule telehealth has allowed us to be successful”	“Clerical staff setup connection [help setup a successful encounter]	“Coordinators with MTFS”	“Each site needs a telehealth presenter/clinical coordinator. Someone who facilitates appointments and makes sure patients are oriented to technology and consents.”
Artifacts – standards, consent forms, ATA guidelines, SOPs, manual	“We didn’t want to be prescriptive so we turned it into a manual and each region can make it into a SOP	“We have consent forms, safety measures (i.e. patient in a private room), policy letter, OPORD, SOP, and we follow	“We continue to coordinate SOPs that establish policies, procedures, and checklists for use by VTC coordinators		“Lots of telehealth SOPs.”

	[referring to TBH manual]"	ATA guidelines."	and on-site psych techs at the patient site. The SOPs, standardized scheduling, coding, capturing workload, and reporting TBH metrics"		
Flexibility with Demand Flux	"We partner with stakeholders to be flexible. We hand out a Gumby award each month to encourage flexibility."		"Our Mission statement is as follows: "To improve quality, access and cost effectiveness of BH services within Region 3 through the coordinated and efficient use of an integrated and efficient tele-behavioral health system. Region 3 directs mission priorities which can be quite dynamic and require extreme operational flexibility."	"Screening. It is smooth because they have this flexibility...When we are in a lull, we can get a tasking from another installation."	
Temporarity				"Funding allows you to hire	"Tripler has been able to

Personnel				temporary personnel”	move significantly because of funding and hiring temporary folks”
Accounting/MEPRS Code			<p>“When requesting new MEPRS, Region 3 was told by the prepotency that “these MEPRS are not issued to facilitate “encounter tracking or numbers”. Region 3 was the first Tele-BH service to obtain and implement a dedicated MEPRS code. This facilitated accurate accounting for TBH appointments . “</p>		
Portable booths			<p>“We have now been successful in setting up one relocatable building (RLB) at a major power projection base, another</p>		

			<p>is in planning and a third will convert a “building of opportunity” into a TBH center (originating site). Whisper Rooms continue to be a temporary solution for TBH originating sites in the SRC setting.”</p>		
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**Challenges Expressed During Interviews across the Regional Medical Commands**

<b>Challenges</b>	<b>Region 1</b>	<b>Region 2</b>	<b>Region 3</b>	<b>Region 4</b>	<b>Region 5</b>
Accounting / Coding	<p>“No single MEPRS code. We have it here for the hub but there is no global MEPRS. To extract data, we have to search by provider ID because no single MEPRS code”</p>	<p>“Providers forget to use modifier. It is another step and coders will often change it too because they don’t understand.”</p>	<p>“In the smaller hub within Region 3: Accounting is a big problem. GT modifier gets lost in and will not end up in the data pool...We have to work with AHLTA people and resource management to reach into the M2 dataset. Data is dropping”</p>		<p>“We still have a problem that modifier goes with CPT code, but the only place we can attach the modifier on the E&amp;M code. So when you are doing a pool, unless do it with wherever modifier shows up, sometimes it shows up on</p>

					CPT, sometimes on the E&M. It is getting better though."
Prescriptions	"They have to fax and FedEx prescriptions"		"It is difficult to write prescription for another location. Prescriptions are not activated for another location (you need additional privileges). It is an arduous process...Each pharmacy has a different process. The solution is to have a CHCS account at the originating MTF. Provider must have the ability to remote into that MTF (preferred method is SS_TNET {Reflections}). It will create a direct, real time connection to the originating site pharmacy. Must be		

			coordinated with both site's IT and Pharmacy leads. Does require separate PW's and account creations.		
Space	"There is no space. I could double productivity if I could double my space"		"One of our challenges includes obtaining appropriate space, facilities and bandwidth for expansion of TBH/VBH services at all installations."	"If they had competing missions, it would be an issue with space. Space is required."	"The facility planners should talk about where does telehealth fit into your structure here? How are you preparing yourself to be telehealth capable? This should be a question that people should ask. We are getting to the point where it doesn't make sense to live without it."
Provider resistance		"Providers are resistant to TBH because they are intimidated by the technology"	"Single biggest barrier is provider acceptability. There is an initial reluctance to TBH in every location. They fear they have		



			<p>additional work with no payoff. Eventually they discover it is easy...providers are concerned with safety and patient decompensating...providers are concerned about building a rapport with patients. Safety SOPs must be in effect. In the event of a dropped video call, there must be telephonic communication in the room so the encounter can continue. This is not standardized. Also, direct communication to support staff on the ground at originating site so intervention by a LIP can be employed if necessary.</p>		
Credentialing/Privileging	"I have to get my privileges		"The biggest challenge is	"It is frustrating to	"We are jumping

ng	renewed in 10 different places”.		privileging. It is cumbersome, not standardized, no control over it. We are at the mercy of it – kills a lot of time and resources...Every credential office is independent. There is no standardization. You can think of it as little fiefdoms at the installation...There needs to be a master set of privileges. I have to manage 60 renewals each year...you still need to get privileged at each place...waste of resources. At least 6 weeks or longer”	get credentialed at each facility. There is 11 MTFs. Surge cell providers need to get fully privileged at all of these facilities.”	through hoops to satisfy all the requirements with privileging”
Scheduling	“Have to log in and out of scheduling system...also you have to change your password every 30		Larger hub: “Scheduling is decentralized. You have to setup processes in each location.”	“We can’t see each other’s schedules across platforms and sites often because there is no	“Scheduling is not conducive in CHCS”

	days”		Smaller hub: “I am not part of a formal scheduling system so I am able to fly under the radar and schedule 1-2 weeks out. It would be hard to do BH scheduling 45 days out. Flexible scheduling is important”. In addition, they stated “Scheduling is a challenge if the provider template is a mix of F2F and TBH. Currently there is one RMC that has a TBH service that sees only TBH patients. Tradeoffs come in how to recapture workload lost as a result of No-Shows.”	centralized scheduling.”	
DIACAP/IM / IT	“Every piece of software needs to be DIACAP certified to be on a network....IM/IT wants	There is confusion on whether the VTC is medical or IT equipment			

	ownership of everything even though equipment is the clinicians”				
Automated intake forms	“Need an automated intake form”				
AHLTA			<p>“AHLTA is not user friendly...you can only be on one AHLTA platform at a time. I had to fax prescriptions due to issues going across AHLTA platforms... Prescribing providers have CHCS accounts at the originating sites and the ability to remote in to the CHCS order entry menu. This is relatively easy to arrange and execute. Not perfect, but does use existing E-record technology and will make it to the AHLTA encounter.”</p>		<p>“Telehealth is not an option for a modality in AHLTA. You have to put it in the notes. Also duplicate registrations are an issue in AHLTA.”</p>
Security			“Privacy	“Security and	

and Privacy			<p>should be the same level as face to face”</p> <p>“No standards with HIPAA compliant rooms”</p>	<p>privacy is not easy to do. They want to know who you are. Once this link is established, it initially can be a little tough. It has been one of the easier challenges with TBH though.”</p>	
Consent forms			<p>“I had a specific TBH consent form in addition to other consent forms. This is now standardized per MEDCOM, but since there is no form number, our JAG recommends against using the form until numbered and official.”</p>	<p>“There is separate informed consent for telehealth and it scares the heck out of soldiers”</p>	
Lack of Common Platform (ex: MSA Access to CHCS)			<p>“It is important for a MSA to have access to a CHCS account with us to book into our template. Some do, some don’t do this. The smaller</p>	<p>“No common platform, therefore it takes longer to relay information”</p>	

			volume places don't have it. We are working toward this being a requirement on the originating site."		
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