

# Meeting the Challenges in Establishing an Army Worldwide Telehealth Network Across 19 Time Zones and into the Theaters of War

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## ***ABSTRACT***

*There were many challenges that were met with solutions in establishing telemedicine in the fixed medical treatment facilities, as well as, throughout the battlefields. Innovative programs and close collaboration with providers, administrators and leaders to include some of our NATO partners met these challenges head on. The U.S. Army has conducted telemedicine worldwide since the 1990s. In 2008 the Army greatly expanded its efforts and telemedicine modalities to create an integrated Telehealth Network. These efforts resulted in over 75,000 telehealth encounters across five regional medical commands, 19 time zones, and 50 countries – including the U.S., American Samoa, Germany, Iraq and Afghanistan. The traditional linear telehealth modalities, such as, non-identifiable emails (no patient names or social security numbers), store and forward, provider to provider and provider to patient were some of the most common modalities utilized. In order to establish a successful, enduring worldwide Telehealth integrated network the following challenges had to be addressed: credentialing; training; funding; return on investment analysis; equipment interoperability; patient, provider, and leader buy-in and satisfaction; bandwidth and connectivity; battle hand off in the War Zones between incoming and outgoing providers; and documenting encounters from the tip of the spear back to the medical centers. Data on the satisfaction of surveyed providers and patients, enhanced providers' knowledge, number of tele-consultations, areas and NATO partners supported, increased access to care, reduced travel times and distances and on how many of the other challenges were overcome will be discussed in this manuscript.*

## **1.0 BACKGROUND**

In 2007, the Army Medical Department did not have a synchronized Army Telehealth Network within and among Army Regional Medical Commands (RMCs) at a time when an increasing number of Soldiers required treatment for significant physical and psychological wounds. As a result, there were delays in access to care, patients had to travel long distances to receive care and providers had to travel to deliver specialty care. Furthermore, there was significant loss of duty time, and most notably a disconnect and a lack of sharing of medical knowledge between primary and specialty care providers. The medical treatment facilities were overwhelmed with the increased war- time demands and did not have the funding, equipment, time, and people to establish telemedicine capabilities. The Telemedicine and Technology Advanced Research Center, TATRC, saw the need for an integrated telehealth approach and submitted a proposal to the Army Surgeon General's Office to establish an Army Medical Department (AMEDD) Telehealth Network. The proposal was approved and funded. TATRC was given the lead for developing and implementing this vital capability.

During the summer of 2010, the ever increasing patient needs (Soldiers in the field) in the psychological health domain, came to the attention of Senior Army Leaders. The Surgeon General called on TATRC to conceive and develop a workable tele-Behavioral Health, (TBH) concept which could be made ready for immediate fielding as a proof-of-concept. The second technology insertion by TATRC was a physically fielded capabilities providing operational TBH in the CENTCOM Areas of Operation (Kuwait, Iraq and Afghanistan).

Prior to establishment of this TBH capability, a Soldier seeking care in behavioral health would need the local unit to provide a vehicle, a driver and assistant with approval from the Company Command to drive to a remote medical treatment facility for evaluation or treatment by a behavioral health specialist, social worker or psychologist. Division Psychiatrists conducted rounds bi-weekly using aircraft to visit remote bases and outposts, to address patient care requirements. Access to care was constrained by the effects of wind and weather and OPTEMPO on travel. Battlefield Circulation by BH Specialists was limited to the impacts of weather and terrain for air travel. This lose –lose equation would soon change.

TATRC established the Army Knowledge On-Line Teleconsultation Program (AKO-teleconsultation) in 2004 which consisted of deployed and other remote providers (some NATO) sending emails sometimes with photographs to designated specialty groups in the states. These emails consisted of de-identified patient data (no names or social security numbers) and a brief description of the patient medical condition and concerns. This program exists today.

## **2.0 METHODS**

### **2.1 Non Operational (Garrison) Telehealth**

TATRC implemented the AMEDD Telehealth Network in a two-phased approach. In Phase I each RMC was provided a management team consisting of a Program Manager, a Clinical Advisor and a Technical Advisor to identify specific needs and establish the program at the local level. Phase II included the purchase of equipment and personnel support (administrative, clinical and technical) for all identified locations. TATRC established and managed the contracts for personnel and coordinated the purchase of equipment with the USA Medical Information Technology Command. Based on continuous and open communications between the RMC Telehealth leads and the TATRC team overseeing the contracts (contract officer representative), contracts were modified fourteen times as the team refined equipment packages, skill sets, and locations to meet the ever changing OPTEMPO requirements. The network information technology infrastructure was upgraded to meet future needs. Equipment and network requirements were vetted with the Army's Medical Department information technical subject experts, to insure interoperability. Approximately two years after the start of this program, the Office of the Army Surgeon General (OTSG) established a Telehealth Service Line (THSL) Office which was missioned to provide policy guidance and central oversight, while giving the RMCs execution authority. The THSL has worked with the Army's Medical Command to improve Telehealth encounter coding and documentation and has recently implemented an automated analytical tool, Tele 360 that captures and analyzes all documented Telehealth encounters. Upon completion of a Medical Command Telehealth workload assessment that will validate contract positions the management of the Telehealth contracts, personnel and equipment will be transitioned from TATRC to the RMCs no later than 31 December 2013.

### **2.2 Operational (War Zones) Telehealth**

The TBH concept was established within 90-days with the combined efforts of various subject matter experts from the signal, clinical, acquisition communities and various command levels. The military programmed and implemented a secure VTC technology solution with a hub and spoke architecture which was available throughout each country, which could provide TBH capability available “virtually” in every forward operating base within each country.

In 2004 it was determined that deployed and remote providers needed a way to communicate with clinical subject matter experts so the AKO-Teleconsultation Program was established see figure one for the methods used to communicate.

### 3.0 RESULTS

#### 3.1 Non Operational (Garrison) Telehealth

The AMEDD Telehealth Program proliferated as a result of this visionary technology insertion management scheme and is now providing service across 19 time zones in over 30 countries and territories. Prior to implementation of the program fewer than six hundred telehealth encounters were documented each year. From April 1 2012 through March 31, 2013, the U.S. Army Medical Command (MEDCOM) provided greater than 36,000 clinical encounters and teleconsultations (excluding radiology and non-clinical uses such as education) at 72 sites in garrison facilities and across 28 medical and dental specialties (see figure 2). Testimony to the impact of this program is the fact that when one compares 2012 data to 2009 there is a **750%** increase in clinical encounter and teleconsultation volume and a growth into 15 additional specialties providing evaluations through this telehealth domain. Furthermore, in FY 12 the DoD Military Health System's (MHS) database which, captures outpatient clinical encounters for the Army, Air Force and Navy, documented that the Army conducted 99% of all MHS telehealth encounters. Telebehavioral health accounts for 86% of the total Telehealth volume in garrison and 55% in the operational environments. To date this Telehealth network effort has resulted in over 150,000 telehealth encounters; millions of dollars saved in cost avoidance (mainly travel); millions of dollars of increased revenue (mainly in sub specialty areas); improved access to care (up to thirty days at some locations); a significant reduction in lost duty time; and enhanced readiness. Most importantly, it has dramatically impacted medical consultations and treatment for our beneficiaries. Telehealth Surveys completed by the US Army Public Health Command documented a high degree of satisfaction among patients, providers and leaders.

#### 3.2 Operational (War Zone) Telehealth

Implementation of the TBH Capabilities profoundly improved "Access to Care" for patients, and allowed greater outreach for Providers and reduced travel risk for everyone. Within a few weeks, patients received non-attribution access to BH care. Providers had immediate outreach to patients in need. Medications could be prescribed remotely, administered locally, and the soldier could return to duty the same day. TBH proved that "virtual" behavioral health is effective in a deployed setting. TBH also proved that early intervention, improved access, and documentation, and provided significantly better patient responses and long term outcomes. The TBH Pilot provided a WIN-WIN patient-provider paradigm.

The TBH network established virtual private places for Soldiers seeking care to find it, far forward on the battlefield. TBH proved the effectiveness of a virtual patient encounter, when a face to face session is not physically possible. In Afghanistan, TBH provides enhanced triage and treatment via a laptop, a headset, and a digital camera which allows real-time, "virtual" face to face encounter before the patient is overwhelmed by the tactical operational environment.

Today, in Afghanistan mental health providers operate 87 continuous use network TBH sites, which support over 1900+ patient encounters each year, (> 175/month) (see figure 3). These sites reduce travel risk for patients, keep Soldiers with their units, and empower providers to conduct battlefield circulation for any patient in their region from remote sites.

The Army Institute of Public Health (AIPH), conducted formal private surveys of Commanders and Patients, to ascertain their level of satisfaction with TBH. The survey of patients confirmed that over 72% of the BH visits would never have occurred if the Telehealth capabilities were not available.

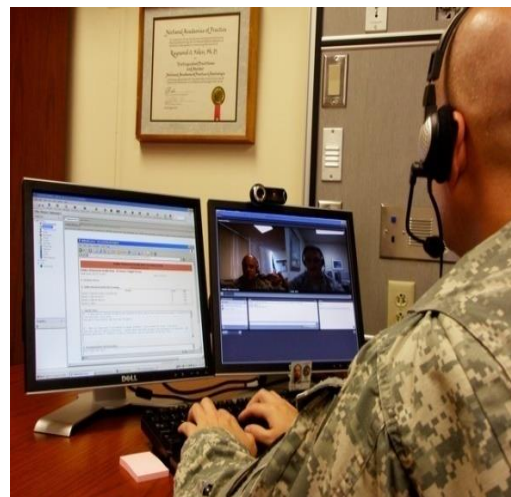
Below you will see the TBH equipment in use between a simulated patient and provider. This system has improved access to behavioral health providers for Soldiers in need and allowed behavioral health providers to support Soldier without travel and extend the reach of behavioral health providers to far forward deployed locations.



Patient to  
Provider  
TBH session



MC4/TBH laptop on  
CENTRIXS (CX-I)  
network



TATRC has propelled the Army's Telehealth Network and TBH capabilities worldwide in support of our nation's most precious resource, the sons and daughters serving in the armed forces. These initiatives are having a very positive and transformational affect on the delivery of health care services by "Army Medicine" around the globe.

From Apr 2004 to June 2013 the AKO-Teleconsultation Program has involved 19 specialties with contact groups. During this period the Program documented the following: 11,253 teleconsultations; 158 known evacuations prevented; 528 known evacuations facilitated following consultants' recommendations; 2,769 different referring health care professionals; and 1,243 teleconsultations on non - US patients with an average response time of less than six hours.

The first NATO teleconsult was received in February 2009. A total of 36 NATO teleconsultations from Afghanistan were received. AKO teleconsultants answered 22 separate teleconsultations from the Canadian healthcare professionals both in Afghanistan and at sea. This included the HMCS Charlottetown, HMCS Toronto and HMCS Vancouver. The last Canadian teleconsultation was in May 2012. Additionally, AKO teleconsultants received 203 teleconsultations through June 2013, from the Multi National Forces- Sinai. The AKO Program received two MFO Sinai teleconsultations in the August 2013.

#### 4.0 CONCLUSIONS

Telehealth encounters have exponentially increased both in non operational and operational environments as evidenced in the statistics presented above. Video teleconference equipment costs have been reduced from \$20,000-\$30,000 per item to around \$250 per item because of new technology developments. Telehealth has evolved from expressed concerns about the efficacy and quality of telehealth encounters verses 'face to face' encounters to an era where most patients, providers and leaders not only accept but request telehealth capabilities. Telehealth has proven to be an effective modality to meet surge demands; avoid unnecessary travel and the associated risks both for patients and providers; reduce lost duty time; increase access to care; and realize related cost avoidance. Telehealth has grown from a disorganized program within a select few Regional Medical Commands (RMCs) that produced a few thousand yearly encounters at a handful of sites with a limited number of specialties involved, to a synchronized program within and among all RMCs that are producing over 36,000 yearly encounters at over 70 sites, in twenty-eight different specialties over nineteen time zones.

Army Telehealth now has a worldwide Telehealth Network that has decentralized execution authority at the RMC level and centralized policy guidance provided by the Telehealth Service Line Office at the Office of



the Army's Surgeon General. We have gone from a stubby pencil method of documenting telehealth workload to an automated analytical tool, Tele 360, along with improved coding. These successes were made possible because we had leadership support from the highest levels whom provided the necessary funding; key clinical, administrative and management champions throughout the Army Medical Department down to the smallest clinic levels; and technical subject matter experts who provided guidance on equipment and network requirements. All involved realized the importance of doing everything they could to take care of our Soldiers no matter where they were located. TATRC's research and management efforts have proven successful because they have involved and listened to the end users; synchronized their work with known requirements; have worked closely with OTSG staffs; and have coordinated with key personnel to transition their research successes into the force structure.

### 5.0 DISCUSSION

Although Telehealth encounters have significantly increased there remains cutting edge technologies needing further research to improve bi-directional communications from the point of injury and other remote areas to the subject matter clinical experts to enhance the level of knowledge needed to provide the best care possible. Currently TATRC operational research is being conducted at the brigade area and below using tactical radios and devices to examine the feasibility to capture data; disseminate the data from the point of injury, and while being evacuated to the next level of care; provide telemonitoring and telementoring and to document the medical condition (see figure 4). Further operational research is being conducted utilizing smart phones to connect medics and other providers from remote areas, throughout the evacuation chain and back to higher levels of medical care. This involves a three phased approach that has already researched connectivity and will soon look at biosensor capabilities; and lastly examine the feasibility of providing 'algorithms – alerts' sent to providers and to patients based on known personal wellness parameters. These capabilities have the potential of improving remote medical care and can provide the documentation that may be needed in the future to determine disability ratings.

In addition to the above operational research, TATRC developed a secure cell phone program and conducted a research study. The study used the Community Based Warrior Transition Unit Soldiers' cell phones to communicate bi-directionally in a double authenticated, secure manner to their case managers and platoon sergeants. The communicated content consists of appointment reminders, health tips and administrative information. Furthermore, it records longitudinally the responses to questions in a color-coded format that reveals trends and alerts the case managers and platoon sergeants when they need to intervene. This project known as mCare as evolved into a program now referred to as the Mobile Health Care Environment (MHCE) which will leverage the mCare successes as they conduct research in the following areas: Patient Center Medical Homes, Pain Management, goal setting and several other areas.

Figure 5 reflects the ultimate tele/mobile health environment we are striving to obtain. This environment will utilize multiple tools and devices that will increase communication among the patients, providers and the medical systems used to document the clinic conditions, medications, laboratory findings and other pertinent data; provide clinical decision support analytics, and send alerts about hazardous physiological or environmental conditions.

Lastly, when telehealth is no longer considered unique and is looked upon as just another way of delivering health care we will have finally overcome misconceptions that have somewhat retarded telehealth adoption. Telehealth needs to be routinely inculcated into daily clinical, business, practices and treated and evaluated similarly to 'face to face' healthcare. We have accomplished much but much more remains to be achieved. Our Soldiers, their families and other eligible beneficiaries deserve the very best that we can give and that is what we will continue to strive to obtain.

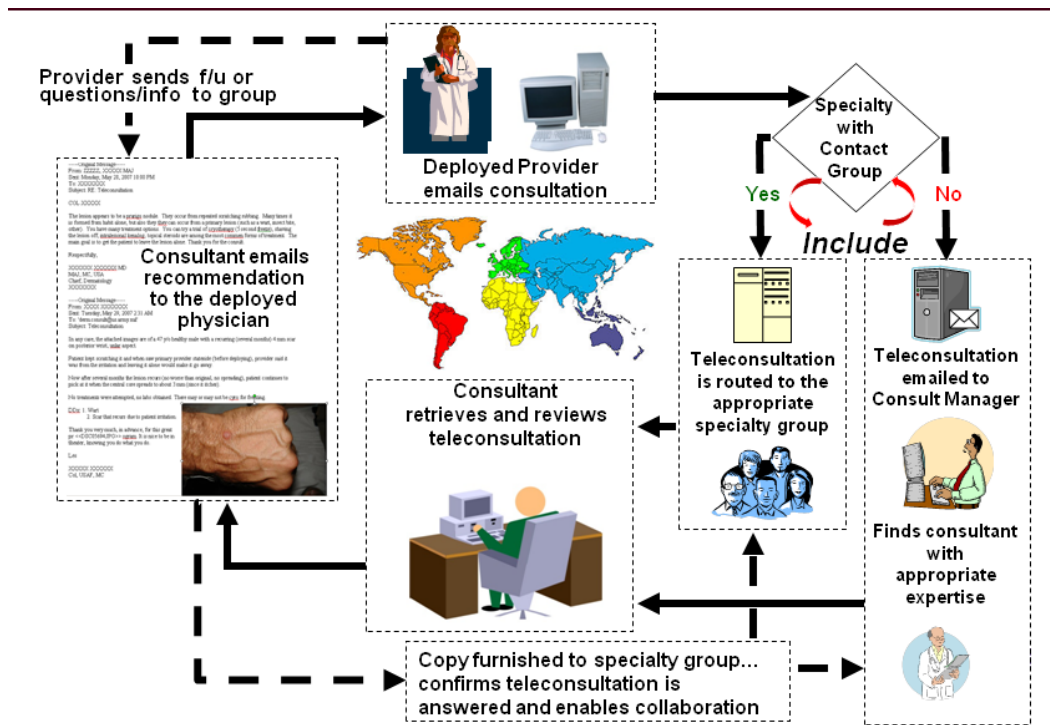


Figure 1: AKO-Teleconsultation Program

- Over 37,500 Clinical TH Encounters and Consults (01APR12 – 31MAR13)\*
- TH Service Line provides centralized guidance; RMCs execute TH

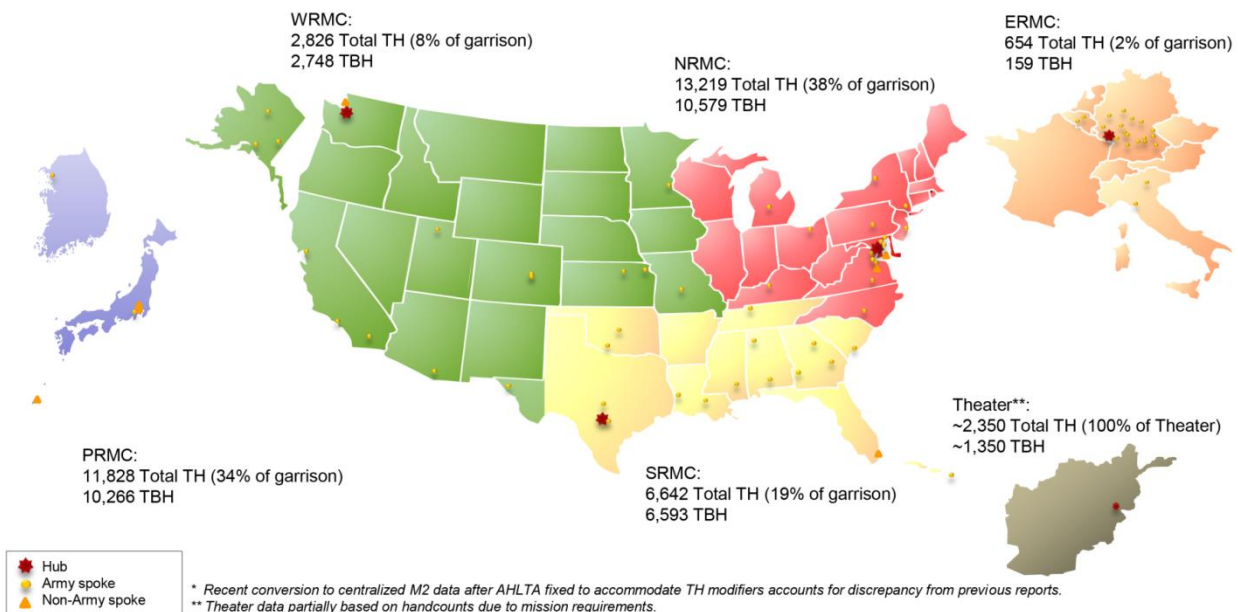


Figure 2: Non Operational (Garrison) Telehealth Statistics

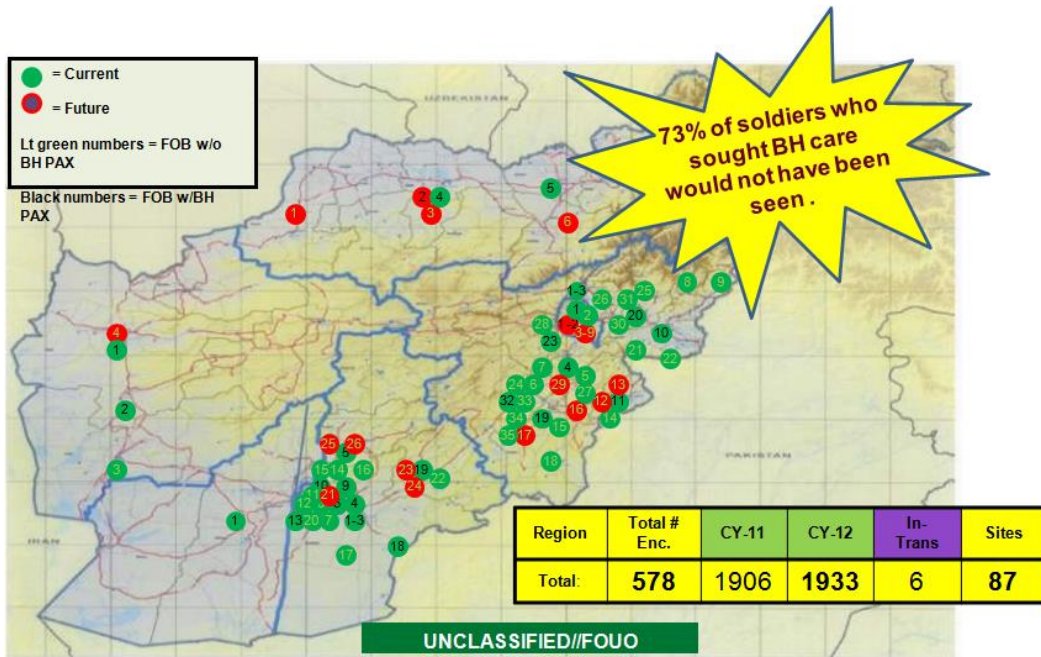


Figure 3: Operational (War Zone) Telehealth Statistics



Figure 4: Current Operational Research



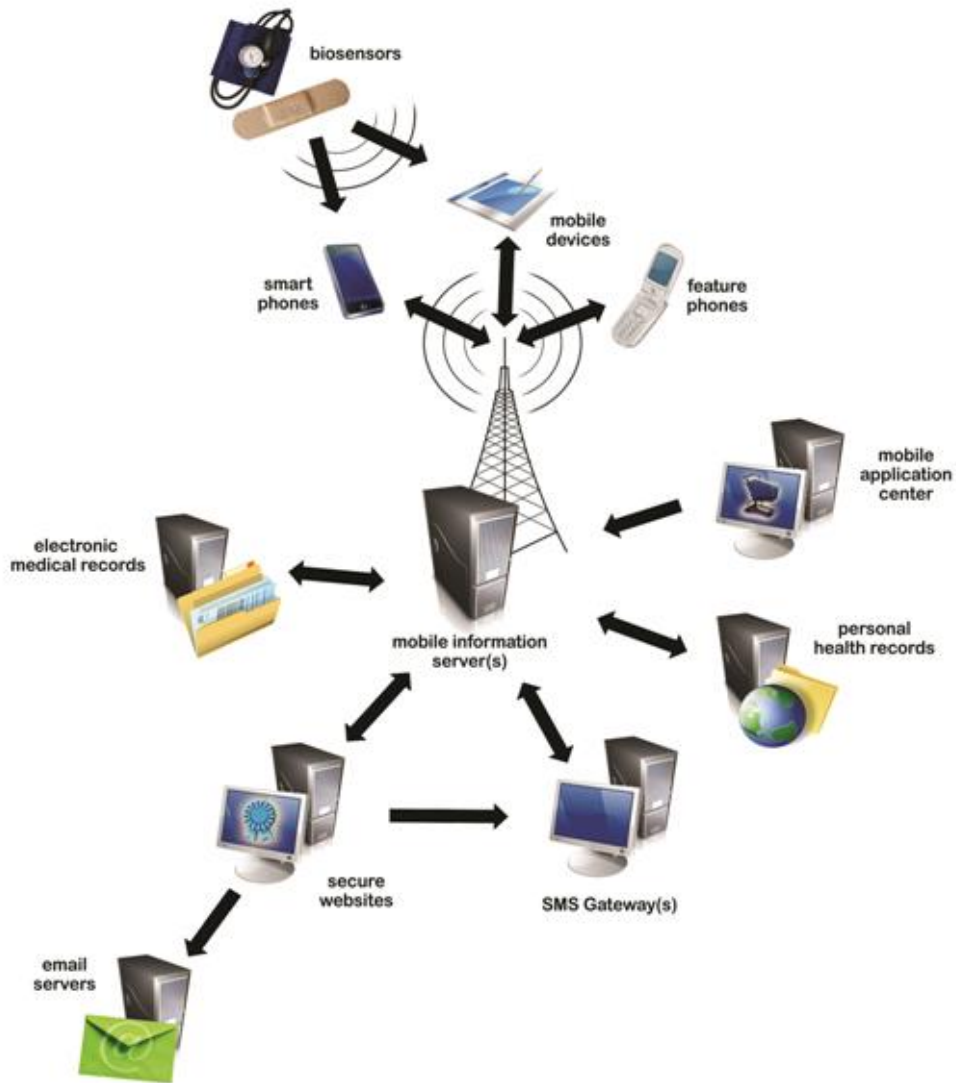


Figure 5: Ultimate Connectivity Goal from anywhere to anywhere