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Telemedicine Goes to Cyber Quest 20

Almost 20 years of military conflict has led to our front line medical personnel being trained to a higher level of clinical skills in order to treat battle trauma. The experience gained through this conflict is that Tactical Combat Casualty Care guidelines have been developed that, along with air superiority to evacuate casualties within the golden hour, have resulted in our survivability rate increasing to greater than 95% when compared to similar injuries in previous conflicts. As we look toward the future, the Department of Defense's medical departments are evaluating peer and near-peer conflicts that will possibly deny our air superiority, thereby reducing the ability of the U.S. military to evacuate casualties during the golden hour.

When this occurs, the highly trained front line medical personnel will now have to treat a casualty for hours or possibly even days. The focus shifts from emergency lifesaving treatments to prolonged casualty care in hostile and austere environments. At this point, highly specialized surgical or definitive care may be required that go well beyond the training level of our first responders. Now these front line medical personnel are in a situation where they must provide ongoing advanced clinical care with limited medical supplies and equipment. As we have all learned through the recent COVID pandemic, this is a perfect scenario in which we can provide expert medical guidance and support to our first responders through the use of Virtual Health technologies to improve clinical outcomes.

In response to this, the U.S. Army Medical Research and Development Command's (MRDC) TATRC is studying Virtual Health capabilities to provide the front line medic the ability to reach out and touch a specialized physician through telemedicine. Members of TATRC attended and participated in the Cyber Quest 20, under U.S. Army Cyber Center of Excellence (CCOE) and U.S. Army Futures Command, and conducted simulated casualty scenarios with medical personnel alongside many talented organizations demonstrating emergent networking capabilities that leverage their strengths to close capability gaps to solve Army challenges. The medical scenarios at this yearly event drove an end user experience designed to obtain user feedback and recommendations on point of care patient monitoring capabilities that can provide knowledge-based telemedicine data through a tactical cloud to a medical provider in the rear.

Mr. James Beach, Project Manager within TATRC's Medical Intelligent Systems Lab stated, "This was the first opportunity TATRC had to attend the Cyber Quest 20 event. The unique environment at Cyber Quest 20 allowed us to demonstrate research prototypes of telemedicine capabilities on a tactical network to address the lack of ability for bi-directional medical communications originating in the tactical environment." The technologies used to conceptually demonstrate tele-mentoring were the U.S. Air Force Research Laboratory's (AFRL) Battlefield Assisted Trauma Distributed Observation Kit (BATDOK), Remote Diagnostic Technologies' Tempus Pro and Corsium Suite, and Aviation and Missile Center S3I's Medical Data Cloud Dashboard (MDCD).

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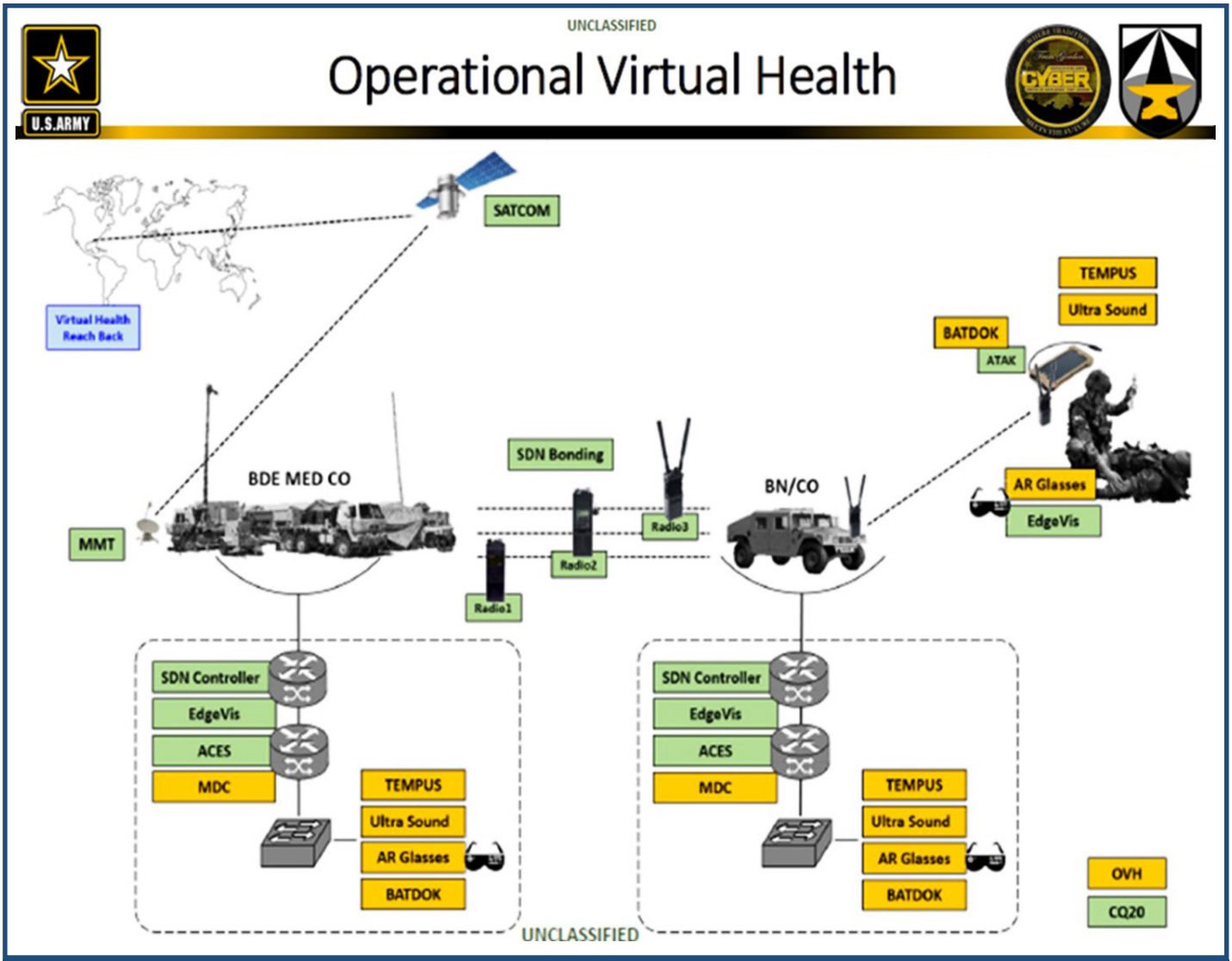
Data from a simulated medical casualty was transmitted from a simulated operational environment at the point of injury to a medical mentor at the Virtual Medical Center. Another objective was to collect data on the functionality, feasibility, and usability of the systems, and provide usable data to advanced developers and transition program managers on further development of the systems being researched.

During the Cyber Quest event, TATRC tested the technologies over different networks. The basic OV-1 concept, point of care patient monitoring devices; BATDOK and Tempus Pro, would make a call and transmit medical data, imagery, Voice over Internet Protocol (VoIP) over tactical radios to a mobile PacStar



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server with the MDCD installed. A medical provider would receive the call and use a web browser on the internet to view the medical data and imagery, and have a VoIP conversation with the front line medical person in order to provide medical guidance.

In collaborative partnership with the U.S. Army Special Operations Command, Naval Special Warfare, Virtual Medical Center, and Dwight D. Eisenhower Army Medical Center, TATRC was able to successfully connect the front line medical personnel at Fort Gordon, GA with surgeons at CONUS medical treatment facilities in San Diego, CA, Fort Detrick, MD, and San Antonio, TX during 36 different medical scenarios. Through the research and medical scenarios at Cyber Quest 20, the medical personnel provided human factors feedback and helped to identify and explore the processes and additional system functions to inform further refinement of these technologies. This information will be shared with the Program Management Office Special Operations Forces Tactical Combat Casualty Care that is accepting the research prototypes for advanced development under the Special Operations Forces Joint Medical Exchange of Documentation Information for Combat Casualty Care (JMEDIC-3) to fulfill the requirements identified in the J-MEDIC3 Capability Development Document.