

Op-T-med and BHSAl Collaborate to Implement Life-Saving APPRAISE on Mobile Devices for Warfighters

This year, two of TATRC Labs joined forces and teamed together. TATRC's Operational Telemedicine (Op-T-med) Lab and the Biotechnology High Performance Computing Software Applications Institute (BHSAl), began a collaborative effort to implement BHSAl's Automated Processing of the Physiologic Registry for Assessment of Injury Severity (APPRAISE) system on a mobile device. APPRAISE, is an artificial intelligence-based system that can alert medics when trauma patients are in need of massive blood transfusions without any human intervention. It collects and analyzes, in real time, vital sign information from the patient during pre-hospital transport. It then uses the results of that analysis to determine if the patient will need a blood transfusion before the patient arrives at the hospital with 78 percent sensitivity and 90 percent specificity, within 10 minutes of the start of monitoring.

Previously, APPRAISE had been tested in civilian markets on ruggedized PCs on board medical evacuation helicopters operated by Boston MedFlight, which services Harvard University Trauma Centers. By implementing APPRAISE onto a NETT Warrior type Android phone, the capability to detect early life threatening hemorrhage, became portable and integrated with the MC4 electronic DD1380 application so that users could document time-stamped APPRAISE scores on a patient's record. In addition to having the APPRAISE score displayed on the electronic DD1380 card application, TATRC's Op-T-med Lab also enabled a Visi Mobile patient monitor to wirelessly transmit the vitals data to the phone via Ultra Wide Band (UWB) secure wireless protocol to eliminate wires while reducing interference and detectability. Future efforts will include integrating data input to the APPRAISE algorithm running on NETT Warrior type Android End User Devices (EUDs) from additional mon-

itoring systems such as the Propaq and Tempus Pro via the UWB protocol, as well as expanding the capability to display multiple patients and their APPRAISE scores on the same screen and post to multiple electronic DD1380 cards, thereby enabling medics to triage multiple patients more effectively in mass casualty scenarios.

TATRC's Operational Telemedicine Lab Manager, Dr. Gary Gilbert stated, "The Army NETT Warrior and SO-COM Advanced Tactical Android Kit EUDs and supporting equipment are already being fielded to designated Role

1 medics as standard combat gear. If the Boston MedFlight tested APPRAISE algorithm receives FDA clearance and is integrated on to those EUDs along with appropriate patient monitoring sensors, the Battlefield Airmen Trauma Distributed Observation Kit (BATDOK) application with a transmittable DD1380, and the PM JOMIS MCC (Mobile Computing Capability), our battlefield capability for triage, monitoring, and treatment of combat casualties prior to reaching

Role 1 clinics and aid stations could be significantly upgraded without adding additional weight to combat loads."

Dr. Jaques Reifman, Director of TATRC's BHSAl added, "The APPRAISE has numerous advantageous features that will facilitate dissemination of the technology. For example, it uses standard vital signs as inputs (heart rate and blood pressures) that are readily available and familiar to medics. Also, the system assesses the reliability of the vital signs in real time, making sure that only those deemed to be reliable are used. Essentially, what APPRAISE does is to automate what experienced clinicians do: look at vital-sign patterns and identify those associated with life-threatening hemorrhage versus those associated with normal fluctuations." 



BHSAl's award-winning, artificial intelligence based system, "APPRAISE".