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MEDRAS Demos Clinical Decision Support System Prototype

Earlier this past summer, Dr. Amy Papadopoulos from TATRC's Medical Robotics and Autonomous Systems Lab (MEDRAS) and Tami Rougeau demonstrated a prototype of a clinical decision support system for Mr. Jay Wang from the U.S. Army Medical Materiel and Development Agency. The demonstration was the final deliverable of a Defense Health Program funded project to develop a baseline proof of concept prototype decision support capability that provides advice to combat medics for immediate care of patients based on a digital knowledge representation of the Joint Tactical Combat Care (TCCC) Guidelines, patient's vital signs and medic generated encounter documentation.

The prototype, developed as a collaborative joint project by two of TATRC lab's, MEDRAS and the Biotechnology High Performance Computing Software Applications Institute (BHSAI), as well as the U.S. Army Institute of Surgical Research, runs on an Android phone, Android tablet, or Android emulator on Windows. The prototype has been integrated with Athena's wireless vital sign monitor (WVSM) and BHSAI's APPRAISE hemorrhage risk detection algorithm. A custom designed GUI, that will later be replaced or modified so that the system can be integrated with BATDOK or MEDHUB, was developed for the prototype that allows the medic to provide information about the casualty's injuries and symptoms, as well as about any interventions such as application of a tourniquet, placement of an airway, or administration of fluid or blood products. Additionally, suggestions, warnings, and questions from the knowledge representation are sent to the GUI for display to the medic.

This demonstration included using the prototype to work through two use cases of typical combat casualty scenarios. One use case took the user through an instance where there was a blast injury with an internal hemorrhage. Given the medic input, the system provided recommendations to the medic resulting in placement of a pelvic binder, IV fluid resuscitation, and administration of ketamine. The second, which was a more complicated use case, involved a complex blast injury with massive hemorrhage and airway compromise. The system guided the user through the application of a tourniquet, insertion of a supraglottic airway, a cricothyrotomy, a needle decompression, placement of a pelvic binder, administration of fluids and pain medication, and treatment for burns.

The project is continuing as an Army funded research project and will be expanded to address the needs of prolonged field care, addressing issues such as lack of resources, longer time to evacuation, and limited trained providers at the point of injury.

TATRC's Dr. Amy Papadopoulos stated, "This is a very exciting project with the potential to make a huge impact at the point of care in austere and prolonged field care environments. I am very honored to be working on this effort as we move it from the initial prototype to an advanced prototype ready for transition."