

Mobile Devices for Training and Assessment in Military Medicine



EXHIBIT FACT SHEET



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Mobile devices are becoming increasingly valuable within the military medical community for both training and operational applications. The Office of Naval Research (ONR) and the Navy Bureau of Medicine and Surgery (BUMED) are currently funding research and development efforts to support the design and validation of training and assessment tools for military medics and surgeons to enable both skill maintenance during deployment and provide more effective means of assessing medical conditions, such as Traumatic Brain Injury (TBI), on the battlefield.

The Surgical Skills Training and Assessment Instrument (SUSTAIN) is currently being developed to support training and retention of specialized surgical skills throughout military deployment cycles. Deployed military surgeons perform a wide variety of combat casualty and trauma surgery procedures; however, specialized procedures such as laparoscopy are not typically performed during deployments, and thus, these skills are susceptible to decay.

current gold standard for laparoscopic skills training and assessment includes a manual skills video box trainer, but does not include integration of the cognitive, psychomotor and perceptual skills involved in surgical tasks, or training for specific procedures. Additionally, current assessment metrics are limited and most training platforms are too large to support mobile refresher training in deployed settings. Thus, the Navy has identified a need for a more comprehensive understanding of the nature of laparoscopic surgical skill acquisition and decay; objective metrics to assess these skills over time; and simulation-based training that supports rapid acquisition, longitudinal retention, and targeted retraining for skill sustainment.

The SUSTAIN simulation-based skills training and assessment technology is being developed to train, assess, and provide refresher training of integrated psychomotor, perceptual, and cognitive laparoscopic skills, and includes novel performance metrics based on motion tracking of the



SUSTAIN



surgeon's hands and surgical instruments. Furthermore, SUSTAIN is being developed as a modular system with deployable training modules that are compatible with mobile devices for refresher training. The ultimate goal of this effort is to develop a mobile training and assessment platform capable of supporting a wide variety of military medical applications.

The Defense Automated Neurobehavioral Assessment (DANA) is a clinical assessment tool consisting of a series of cognitive and psychological test batteries on a ruggedized mobile device that screens for performance degradation as well as early signs of Traumatic Brain Injury (TBI)—also referred to as mild TBI (mTBI)—and Post Traumatic Stress Disorder (PTSD). DANA is a clinical decision support tool developed for and funded by the Department of Defense (DoD) for use in the field. The goal of DANA is to assist first- and second-line providers in the field, close to the time of an incident, in determining the type of impairment and level of functioning. The DANA software is programmed to run on a variety of lightweight mobile devices. The mobility of the DANA system allows for assessing service members in a variety of environments and dispositions closer in time to any potential traumatic incidents (e.g., IED blast exposure), and the test data seamlessly syncs with a corpsman's laptop for further analysis.

The high tempo of combat operations over the past decade have brought increased incidence and increased focus on TBI and PTSD among service members. Navy and Marine corpsmen, physician assistants, and general medical officers are the front line of initial assessment and diagnosis for TBI and mTBI. Because of the impact of mTBI on the individual service members' medical readiness, their work performance, and unit operational readiness, proper assessment and diagnosis is essential. Currently, many providers lack the training or experience to accurately identify mTBI. An additional problem is quantifying the extent of the individuals' functional deficits to facilitate duty dispositions and treatment planning, and to provide comparative data to measure improvements in functionality and readiness over time.

Once fully validated in late 2013, DANA will assist first- and second-line providers in the field in determining types of neurocognitive impairment and level of functioning in cases where a service member may be experiencing difficulty due to brain injury or combat-related physical exhaustion or emotional distress. DANA will assist the providers with assessing fitness for duty and triage needs.

