

Medical Cognitive Readiness: From Theory to Practice

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Background/Problem – The Department of Defense (DoD) Advanced Distributed Learning Initiative provides crucial and timely enabling capability to ensure that warfighters of the future have superior and affordable technology that improves operational effectiveness. Technologies that improve Cognitive Readiness are components of this initiative. Our team has defined Cognitive Readiness to mean possessing the psychological and sociological skills, knowledge and attitudes that individuals and team members need to sustain competent professional performance and mental wellbeing in the complex and unpredictable environments of military operations.

For the first time, a Medical Cognitive Readiness Decision Support System, known as M-CREST (Medical Cognitive Readiness Statusing Techniques), will be available to medical teams prior to deployment to assist them in better adapting to their new environment. The M-CREST tool can be used to assess individual and team cognitive states of readiness to carry out medical mission requirements under varying threats and contingencies.

Tools and Methods – We used Iraq and Afghanistan lessons learned; interviews with surgeons, nurses, and medics; and theory from multiple fields to identify important factors that contribute to Medical Cognitive Readiness.

Over 1,600 surveys were reviewed. The surveys consisted of validated and reliable psychological, educational and business tests and metrics. Each survey was evaluated against three levels of criteria for potential use in M-CREST. The criteria used included such things as ease of administration, interpretability of the scores, target audience, length, reliability and validity scores as well as many others. The criteria were selected to ensure that M-CREST includes the most appropriate surveys. These surveys are combined into a Decision Support System with the capability to diagnose and prescribe individualized guidance for medical team members.

M-CREST is automated, and hosted on a web based system so that our Decision Support System can be accessed by PC, PDA, and notebook technologies. Object-oriented programming language is used to ensure that software can be easily debugged and sections, such as specific tests or features, can be moved around throughout the prototype's layout without affecting performance.

Results – Initially, twenty-one factors were identified that contribute to Medical Cognitive Readiness. Through our surveys that were distributed to medical personnel deployed in the US, Afghanistan and Iraq, the most important cognitive readiness factors were found to be Flexibility/Creativity, Leadership/Organization, Cognitive Resources, and Decision Making. Soldiers were asked to rate each factor on a scale from one to four in terms of importance for cognitive readiness and mean ratings were obtained. Based upon the factors selected we identified five surveys for inclusion in M-CREST that address the selected Cognitive Readiness factors: Teamness Index, Cross-Cultural Adaptability, Learning and Study Strategies Inventory, Meta-Cognition Skills Inventory, and Teamwork KSA.

M-CREST includes automating decision aiding, which allows for very specific prescriptions for each individual. However, individual performance information remains confidential for all users of the system. Also, some modules are administered to all team members; others are administered only to physicians and nurses or to medics.

Conclusions/Discussions – Historically, military psychological interventions have been employed after symptoms, such as stress, have occurred in the field. This is a state of the art technology that offers an “inoculation” for medical teams prior to their deployment so that they will be able to employ new behavioral repertoires to maintain their Cognitive Readiness.

Cognitive Readiness itself is a new evolving theory, and was redefined and operationalized by our M-CREST team. Cognitive Readiness may have other applications to first responders in local communities, and in government such as Homeland Security.

References –

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