

**RESEARCH TITLE:** Dynamic Performance Measurement Tool for Medical Team Training

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**ACADEMIC AREA/FIELD and EDUCATIONAL LEVEL:** Doctoral Level, Bio-Informatics

**OBJECTIVE:** Develop and demonstrate an adaptive, performance measurement system capable of measuring dynamic medical team performance.

**DESCRIPTION:** This effort will develop a dynamic performance measurement system for medical personnel when conducting training evaluations in classroom and practicum settings. One of the most difficult activities in determining deployment readiness is evaluating medical team performance. Currently, Critical Care Aeromedical Trauma Teams demonstrate readiness on a single critical care patient scenario before a team of evaluators. However the dynamic nature of the performance often leaves the evaluation team assessing the overall outcome of the team without being able to judge any one team member's performance fully. There are numerous tasks that take place while applying medical interventions in a critical care scenario, when there are several team members qualified to accomplish those tasks. While one task is being done, other team members must monitor and/or accomplish other tasks. Multiple evaluators annotate what medical interventions are executed, when they happen, who accomplishes the intervention, what the other team members are doing during the medical monitoring. For example, a patient is being treated in an aeromedical evacuation simulation. The physician (MD) might intubate the patient while the registered nurse (RN) preps the tools and the respiration therapist (RT) ventilates the patient. Any one of the three team members could have done the intubation; however, the MD performed the action. Thus, the performance based task of intubating the patient is removed from the RN and RTs performance based evaluation list and other tasks show up or removed from the rating system while the MD is rated on their performance for that specific task/action. A system which dynamically adapts to what tasks are accomplished, by who, what other team members are doing, removing and adding measures to be assessed depending on actions taken by the team member is desired. This effort will develop a dynamic performance assessment program that can be used by medical instructors/evaluators to assess medical professionals. The proposed system will integrate with virtual and constructive entities, to include high fidelity mannequins, archive performance based data for feedback and create a performance based training history for medical professionals. The system will include an authoring toolkit for users to author their own measures for inclusion in their specialty.

The outcome of this research should result in a detailed architecture on how a dynamic performance based evaluation system could be accomplished with three or more medical interventions executed by a medical team consisting of four members—2 nurses 1 physician and 1 physician's assistant. The architecture must have a performance measurement authoring and data warehousing capability for users. A highly desired outcome would be a developed, refined, tested prototype of a dynamic performance assessment evaluation system. Additional activities may include a demonstration of the prototype in a medical simulation environment.

**RESEARCH CLASSIFICATION RESTRICTIONS: Unclassified**

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**USAFA (only)**

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Yes     No

**REFERENCES:**

**Ramachandran, S. (n.d). Intelligent, Automated Performance Assessment and Diagnosis for Team Training. F071-021-1510**

**Manser, T. (2008). Teamwork and patient safety in dynamic domains of healthcare: a review of the literature. ACTA Anaesthesiologica Scandinavica, 53, 143-151.**

**Wright, M. C., Phillips-Bute, B. G., Petrusa, E. R., Griffin, K. L., Hobbs, G. W., & Taekman, J. M. (2009). Assessing teamwork in medical education and practice: relating behavioural teamwork ratings and clinical performance. Medical Teacher, 31(1), 30-38.**

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