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Applied Health Information Technologies - Clinical Looking Glass

PRINCIPAL INVESTIGATOR:  
Dr. Eran Bellin

CONTRACTING ORGANIZATION:  
Montefiore Medical Center

Bronx, NY 10467

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<b>14. ABSTRACT</b> The Department of Defense/Tricare system faces significant challenges in protecting the health of nine million service members, their families, and retirees. At the same time these entities must control costs and monitor, measure, and improve the quality of care provided to its members.  Clinical Looking Glass (CLG) provides actionable health care metrics on longitudinal patterns of care generated from a data repository of clinical and administrative information. Implementation of CLG on a "proof-of-concept" data set from the Military Health Service will allow demonstration of its effectiveness as part of the DoD's arsenal of quality of care analysis tools.					
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## Medical Surveillance Technology – Clinical Looking Glass

### ***Introduction***

Clinical Looking Glass (CLG) is a medical surveillance and quality improvement software system that provides actionable health care metrics on longitudinal patterns of care generated from a data repository of clinical and administrative information. It is in production use at Montefiore Medical Center (MMC) in New York City. CLG fosters a cultural environment that rewards initiative while still protecting patient privacy and standardization of analysis.

This award provides continued support of CLG proof-of-concept users evaluating the tool for Military Health Service (MHS) use. In support of this objective, the project includes development of training materials and formal end user training. Also included is research and development to make CLG capable of working with server farm technology to improve performance.

### ***Body***

#### **Overview**

##### **Training**

The Clinical Looking Glass end user training materials have been completely revised to include new functionality developed during the course of the award and to remove functionality sundowned with the release of CLG 4.1. The CLG training team began creating customized end user documentation for the MHS CLG proof-of-concept, using MHS-relevant clinical examples based on data available in the proof-of-concept data mart.

##### ***Objective 1: Support and mentor pilot users***

Because of implementation delays and preparedness at the client site, Walter Reed National Military Medical Center (WRNMMC), end user evaluators for CLG were not identified during the period of performance. The CLG team performed training of two clinical champions.

Objective Completion: 10%

##### ***Objective 2: Administrative support***

The CLG team provided administrative support for the clinical champions who were trained.

Objective Completion: 05%

##### ***Objective 3: Identify Uniformed Services University of the Health Sciences (USUHS) users***

The Principle Investigator worked with clinical champion Dr. Harry Burke at USUHS to identify appropriate user types. Dr. Burke will identify individuals who fit these appropriate user profiles and invite them to participate.

Objective Completion: 20%

##### ***Objective 4: Train USUHS users***

This training will occur once the USUHS users have been identified and enrolled.

Objective Completion: 0%

##### ***Objective 5: Train non-physician users***

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These users will be identified and enrolled by Dr. Burke and this training will occur concurrently with the USUHS training.

Objective Completion: 0%

### **Scalability**

During the period of performance the CLG team researched server farm technology options and applicability for use with CLG. A use/test case with emphasis on processing complex analytic objects for large data sets was defined. An implementation strategy was identified and changes to the CLG architecture and code were made to support it.

During implementation of the architectural, environmental, and code change the team developed a performance test suite. Benchmarking of the existing CLG system was not possible – it could not return results for the specified use case. The team instead benchmarked the upward limit of performance: Results were returned on smaller data sets with far fewer analytic objects in several hours. In many cases, backend processes timed out before completion.

A proof-of-concept two-server farm environment was implemented and the CLG update was deployed. Benchmark testing in this new environment with the updated code and architecture resulted in delivery to the specified use case in approximately thirty minutes.

The existing CLG PHI Proof-of-Concept available to MHS users does not include these changes, nor does the POC environment support a server farm. Final reporting for this award will include the environmental specification to support this level of performance.

Objective Completion: 100%

### **Protected Health Information Data Access and Use**

Use of Beneficial Encrypted File (BEF) data and Protected Health Information (PHI) data through CLG was determined to be governed by the USAF Population Health data use agreement covering the data source. All CLG personnel with access to the system have received Position of Trust clearance.

Dr. Harry Burke at WRNMMC is working with their IRB to develop CLG usage policy and procedures. The trainees will not be required to sign a MMC data use agreement as indicated in the proposal for this award.

### ***Key Research Accomplishments***

- Implementation of server farm technology in the development environment.
- Training of two clinical champions in the use of CLG with MHS data.

### ***Reportable Outcomes***

- Applied for and received POC approval of no-funds extension to continue project through 2013.

### ***Conclusion***

At the close of this year we are on the verge of training our first MHS users at WRNMMC. To reach this goal over the course of this year we have relied upon our relationship with Air Force Population Health and the SPAWAR data center to support CLG and provide MHS data to its data mart. During the reporting period the CLG servers were moved out of the Washington Navy Yard data center along with the rest of the Air Force enclave. This move was not significantly disruptive to our progress. Population Health's commitment to the project was exemplified by the subsequent load of expanded PHI data to the CLG data mart.

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The team underwent some churn during the reporting period. Several software engineers departed and were replaced. The Senior Clinical Analyst, responsible for training and end user mentoring, departed and a replacement identified. Several months of development were allocated to performance and scalability improvements. Release 4.1 of CLG was rolled out to the Montefiore community and subsequently installed on the proof-of-concept and fully tested there.

The CLG PHI proof-of-concept is poised to be revealed to MHS users. The CLG team eagerly awaits the opportunity to train members of this community in the use of this powerful tool.

### **References**

None Cited.

### **Appendix**

List of CLG team members whose salaries were partially funded by this contract. Percentages of salary vary due to personnel leaving the team.

Castro, Moises (departed team)	0-15%
Chowdhury, Soma (departed team)	0-20%
Edwards, Richie	20%
Geberer, Noah (departed team)	40%
Golden, Joe	10%
Lee, William (departed team)	0-30%
McCroskey, Mia	27%
Muresan, Mircea (departed team)	0-15%
Patel, Saurabh	15%
Paul, Lisha	15%
Powers, Ken	15%
Srivastava, Navneet	15%
Swamy, Harish	15%
Zappulla, Ron	30%
Luis Lira	10%
Weissman, Judith (departed team)	0-30%
Ding, Jinlin	15%
Mukerji, Himadri	15%
James Lee	15%