
The Role of Simulation in Healthcare

A Valuable Tool to
Strengthen VHA
System Redesign
Initiatives

ProModel Corporation

Executive Summary

The Veterans Healthcare Administration (VHA) is facing challenges in meeting their own access and quality metrics for their population; process improvement, patient flow, timeliness of access to care, as well as meeting Joint Commission Compliance remain central themes to ensuring that veterans are able to obtain timely and high quality care.

As a result, a number of initiatives have been developed across the VHA to create an environment of continuous process improvement through data analytics, process redesign and careful measurement of key performance metrics.

The goal of this document is to demonstrate why and how ProModel Corporation's discrete-event simulation solutions are being used as a valuable tool to help the VHA meet its objectives of improving access to quality care for veterans across the country.

Identified Need

Patients continue to obtain care through the both the Medicare system & commercial hospital systems because the VHA has insufficient capacity to meet the entire healthcare needs of its VA population. As a result, the VA continues to spend billions of dollars a year buying care from non-VA organizations. Inpatient length of stay (LOS) is a large contributor to the inefficiency of the VA system. At last measure, 120,000 more days of inpatient stay are used by the VA system as compared to private sector benchmarks. Inadequate capacity at VA facilities has also caused a major wait problem. As Dr. Michael Davies has highlighted in his article on System Redesign, "Care can only go as fast as the slowest part of that system."

Meeting the Challenges

Failing to address the important principles of patient flow through the system can have significant negative impact on important care outcomes for patients and families within the medical center, as well as profound financial implications for the entire VHA. The VHA has already identified the elimination of backlogs and decreasing queues as important initiatives to improve patient flow, manage demand and increase throughput in patient care areas. Also, managing constraints to work flow and patient flow within and between departments is critical to addressing the capacity constraints within the VA health systems. For example, closing or delaying patient access to an entire emergency room or operating room due to limitations in patient throughput can have systemic implications across a medical center. Another example, outpatient appointment delays often lead to patients not receiving timely follow-up care which, in turn, can cause a readmission.

New Approaches: True System Redesign

In order to effectively apply principles that will improve flow through the VA health systems, a traditional management approach is simply not sufficient. Applying these principles in an effective manner requires a "true system redesign" (Davies). Many of the issues described are inherent complexities of health systems, high variability and complex interdependencies of resources. Variation is debilitating to healthcare systems. "Variation in 'natural' and 'artificially' generated arrival rates can dangerously overfill hospitals, cause diversion, and overstress staff" (Davies). The complexity of addressing variation in everyday situations challenges healthcare systems to gain a better understanding of what drives it and to carefully consider how they can measure, predict, and respond to it.

ProModel Corporation Solution – Applying Simulation Technology to Healthcare

ProModel's powerful simulation technology combined with 20 years of health care experience places it in a unique position to work with the VA in meeting the challenges of quality management, process improvement, patient flow and admission/continued stay appropriateness. ProModel is a decision support technology company, delivering innovative, turn-key solutions to help maximize throughput, decrease cycle time, increase productivity, minimize costs and reduce the risks associated with significant changes occurring across complex healthcare systems. Our solutions accurately account for inherent variation and interdependencies which empowers our partners to make better decisions with available information while meeting important performance objectives.

ProModel and the VHA

ProModel Corporation has been working within the VHA System demonstrating the ability to improve work flow processes, bringing substantial costs savings and adding revenue to the VHA organization. In order to develop long lasting, reusable solutions for identified performance improvement needs within the VHA, ProModel's approach is as follows:

1. Work closely with the VA System's Redesign Committee focusing on each VISN to help identify and impact important projects already in progress while continuing to cultivate a relationship on a national level as the national System's Redesign group becomes formalized.
2. Work collaboratively with the System Redesign Committee Point of Contacts at the VISN level to identify and target key hospitals currently experiencing significant constraints.
3. Work with the VISN and the target hospital to develop and implement a customized solution and then evaluate and quantify its impact.
4. Develop a network within the VHA for sharing models and simulation studies so that the VHA system can continuously benefit from its process improvement efforts.

Results for the VHA

There are several main, key benefits for the VHA which ProModel anticipates from this collaborative effort:

1. Improve Access to Care (Patient Flow) and Quality of Care initiatives
2. Enhance and accelerate the evaluation process used by the SCIP (Strategic Capital Improvement Program) to determine which facilities will receive funding and when
3. Increased Local VISN Involvement and Recognition
4. Sharing of data VISN wide
5. Eliminate redundancy
6. Process Standardization across VISN
7. Improving Sustainability of Projects
8. Development of a ProModel Website Portal for Continuing Educational Programs

Successful Simulation Location Implementations within the VHA System:

- Buffalo
- Cheyenne
- Detroit
 - OR Optimization
- Huntington
- Indianapolis
- Lexington
 - OR Expansion Analysis
- Louisville
- Memphis
- Mountain Home (Johnson City)
 - OR Proposed Renovation/Expansion Evaluation
- Nashville/Murfreesboro
 - OR Capacity Analysis
- New York
 - Patient Transportation Optimization
- Palo Alto
 - OR Optimization
- Pittsburgh
 - Optimizing the Lung Cancer Treatment Process
 - Modeling A New Same Day Surgery Unit
- Providence
 - Strategic Patient Logistics
 - Eye Clinic Optimization
- Reno
- San Francisco
- St. Louis (Self Sufficient Modeling Capability)
 - Pharmacy Call Center
- Tampa
- VISN 1 VERC
- VISN 11 VERC (Self Sufficient Modeling Capability)

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