



MeritCare Health System Uses Simulation to Optimize Integration of Service Areas into New Day Unit

Simulation shows potential to increase patient throughput by up to 40% and demonstrates capacity for 30% more volume

Visualizing the Problem

MeritCare Health System in Fargo, ND was in the process of preparing for the consolidation of several service lines into a new Day Unit. The new facility will house Interventional Radiology, Cath Lab/Heart Services, and AM admissions for Surgical Services.

With architectural and building plans complete and construction slated to be finished in approximately two years, MeritCare was faced with the complicated task of integrating three different services, each with their own unique operational practices, into one shared space. Recognizing that the related departments may not initially yield optimal performance in their new environment, and the undertaking would require considerable planning, team building and coordination, MeritCare retained ProModel Healthcare Solutions.



Analyzing the Situation

In order to provide the highest confidence level in the new facility design, it was critical that patient care processes, projected staff and resource allocations, and case volume projections were clearly defined, analyzed and tested to identify realistic performance expectations. MeritCare selected and worked with ProModel Healthcare Solutions to create a dynamic simulation of the new facility for the purpose of projecting how the new Day Unit would operate upon opening, and to define areas for process improvement and ensure optimal patient care.

ProModel helped MeritCare achieve its design and planning objectives using their proprietary VAO (Visualize. Analyze. Optimize.) methodology and simulation software technology.

Key metrics used to measure and compare (optional) operational scenarios, for the purpose of identifying the most effective solution:

- Length of Stay (micro and macro)
- Cost/Revenue
- Patient Throughput
- Staff Utilization (patient transport, room-prep)
- Day Unit Close Time
- Patient Wait Times

Optimizing the Solution

Working with MeritCare colleagues, the ProModel Healthcare Solutions' Team recognized the newly designed Day Unit had the potential to accommodate a substantial increase in patient volume over current levels. This was well-received news, given many in administration and operations feared the new facility might not be able to handle the projected volumes.

Additionally, the department's design allowed for the implementation of recommended changes, based upon the strength of the simulation model which included:

modified staff and space deployments, changes to processes and policies; utilization of cross-trained staff, centralized records, standardized patient transport, and multi-use rooms.

Sue Fridgen, MeritCare Quality Management, commented, "One of the greatest benefits from the project was the capability to communicate effectively with internal team members and management to gain consensus on issues of critical importance." The following specific results will be achieved upon final implementation of the project recommendations:

- Reduction of 3 RN's through cross training, resulting in savings of \$191,478 per year.
- Reduction in transporters resulting in savings of \$30,377 per year.
- Deployment of non-dedicated patient rooms, improving operational flexibility and resulting in a potential for up to 40% greater patient throughput.
- Facility's design supported staff-efficient growth, e.g. ability to manage a 30% increase in patient volume, with only 16% increase to staff allocation.
- Determining the New Day Unit can support a substantial increase in Cath Lab patients. Cath Lab will open two additional rooms to support projected volumes and meet performance requirements.
- Minimizing room holds for patients exiting and then returning to the Day Unit, after identifying that the system bogs down when the volume increases and the hold time exceeds 30 minutes.
- The model is being used by MeritCare staff and will serve as an excellent long-term tool in evaluating future opportunities for care process improvement and change.

