A new model

Health care professionals must continue to find ways to become more efficient and effective to keep up with varying patient needs while continuing to re-evaluate their facility planning. Simulation lets them evaluate different ideas and ask what-if questions with alternative methods of meeting demands using a variety of resources prior to implementation.

The problem
Helping clients identify obstetric bed need when planning a new or renovated facility is one of many services offered by Smith Hager Bajo (SHB), a consulting firm specializing in strategic planning, market research, facilities planning, and operations improvement for health care organizations. For years, the method used for this analysis was a ratio formula involving volume and length of stay. In the 1980s, a computerized model using probability theory and the Poisson mathematical formula became popular, but neither method could incorporate the impact of scheduled procedures or seasonal variability into the analysis.

Research led SHB to pursue discrete-event simulation for analyzing obstetric bed need. Since simulation accounts for the dynamic variability of patient arrival rates, length of stay, and service times, SHB could provide more predictive accuracy than educated guesses made from past experience, simple ratio techniques, or static mathematical algorithms.

The simulation solution
SHB contracted out the model development and assumed the role of subject matter expert for the model development team. It approached Micro Analysis & Design (MA&D) to create a model using Micro Saint Sharp simulation software that would be flexible for use with all clients. The model needed to be user-friendly so that SHB’s customer could use it daily with minimal training. Additional conditions for the model included realistic data collection, rapid turnaround time, reasonable cost, and an understandable results report.

Model development began with discussion and description of the scenarios that could occur in an obstetric facility planning project. Through a collaborative effort between the MA&D expert modelers and SHB, the obstetric model was developed. It has exceeded SHB’s expectations in many ways. They can now analyze staffing requirements and evaluate the impact of practice changes on staffing and bed need with an easy-to-use Micro Saint Sharp model. In addition, a spreadsheet template was created that allows them to determine probabilities for scenarios and to customize results reporting.

After the model was completed and used for numerous projects, they came back to MA&D to sponsor the development of a new model for the neonatal intensive care nursery focusing on the activity flow and resource requirements for a variety of patient types.

The bottom line
The obstetric model has been used with more than 50 clients since it was first developed. The projects have ranged from facility planning for bed need to staffing analysis and decision-making regarding practice changes. Several clients have been able to document significant savings in remodeling costs because of the model results. One client had a certificate of need hearing cancelled and a facility project approved based on the model. Service-line managers have been impressed with their ability to budget staffing requirements.

The model’s additional uses have allowed SHB to increase its services, which has resulted in adding new clients. None of the firm’s direct competitors are able to offer this tool to their clients, giving SHB a unique competitive edge.