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can help patients *and*  
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# Life support **FOR** hospital staff

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## *Better nurse scheduling can help patients and the bottom line*

HEALTHCARE ORGANIZATIONS ARE under tremendous pressure to contain costs, advance healthcare delivery, improve customer service and manage the complexities within their healthcare business model. The top leadership of these organizations has implemented programs such as lean, Six Sigma, theory of constraints or segments of such programs, and the measures of success usually include components of education, certification and events, as well as lead-time reduction, variation elimination and organization. What's often missing is a successful bottom-line impact.

Paying attention to the bottom line seems to challenge the necessary component of healthcare service quality, but that's not true. Research has shown that as patient-to-nursing ratios move from an overstaffing condition toward an appropriate staffing condition, the level of patient interaction stays the same, which is a clear indicator that quality of care and patient satisfaction does not suffer.

Bottom-line impact must be driven by measurable cost factors, usually personnel. Professional labor is the biggest cost component of healthcare in a hospital, yet the answer to any issue in the service delivery model is to add more people. This is a quick fix to a problem that cannot wait for investigation, measurement, redesign or process change. This attitude of quality control being in direct conflict with cost containment quickly achieves diminishing returns.

Another measurement challenge is the perception of the professional labor involved. Measuring professional activities always has been an engineering challenge due to the knowledge requirements, inconsistency of the activities, variation of activity duration, and the dynamics of clinical care for each unique patient. Work measurement has shown some predictable work elements called nonvariable activities. The rest can be measured as singular events called variable activities. Using this logic, a nurse staffing model has been developed

to predict appropriate staffing levels on a daily basis and to measure accurately the financial impact of an improved staffing process.

### **The nurse staffing model**

The research described here centers on a nurse staffing model that has been developed for a regional hospital in the Midwest United States. The hospital has approximately 200 beds and provides cardiology, surgery, orthopedics, neurology, oncology, vascular medicine and rehabilitation for its region. The hospital has a level one trauma center, offering emergency health and trauma services 24 hours a day.

The organization employs more than 600 nursing professionals with a wide range of qualifications, training, credentials and experience. Connecting these human qualifications to patient demands can be difficult.

A major outcome of this study was the development of a model to predict the appropriate staffing for any given hour, shift, day or week. The model was loaded to predict patient demand and the associated activity time required to match that demand. The key difference between this model and most others is that this model's staffing is based on actual activities. The times to perform those activities derived from extensive measurement and observation as opposed to benchmark and planning ratios. The model distinguishes between two activity types: fixed and variable. Fixed activities occur daily for all patients, and demand is driven by census. Assessments, giving medications and coordinating patient care are fixed activities. Variable activities are singular activities that create an increase in workload over a concentrated period of time. Admissions, discharges and certain procedures are classified as variable. It is important to distinguish the difference for the model to be as accurate as possible and be dynamic enough to match hourly demand to staffing.

The organization has six inpatient nursing departments. The average patient loading for all of these departments over the last 12 months is approximately 77 percent, with heavier loading on the intensive care units.

Actual staffing levels have been significantly above the recommended patient-to-nurse ratios in all departments. This doesn't mean that the nurses are inefficient or management cannot control resources, but it is evidence that the current process does not allow the organization to be successful on a consistent basis. It's not a people management issue. Rather, it's a process that needs to be improved.

The hospital administration targets nurse staffing levels to meet requirements for an 80 percent census. Similar to most hospitals, the inpatient care floors primarily run two 12-hour shifts per day in which the nurses self-schedule themselves up to six weeks in advance. Approximately two weeks in advance, the nursing department manager will begin to level scheduling according to the 80 percent census rule, personnel availability, leadership practices and decisions. The staffing levels then will be adjusted in four-hour increments based on actual patient demand.

Performance fell short of the goal. Staffing was not as flexible or dynamic as patient demand. Flexing the staffing level down or up was difficult. The nursing pool mostly was used for vacations, sick time and general emergency needs rather than for true strategic planning for flexibility of staffing.

The labor component of the healthcare business model is a major opportunity for healthcare improvement. Improving this while offering better healthcare delivery may seem like a dichotomy, but it's not. Measurement of professionals providing clinical care to patients has shown that patient care in terms of patient outcomes is not improved by increasing the nurse staffing level.

Modeling historical staffing performance compared to the proposed process showed tremendous opportunity for financial savings, which motivated the management team. Moving the organization from the 60th percentile in nursing hours per patient day to the 25th percentile was a phenomenal improvement. Even with such success, the opportunity to reach world-class performance in the fifth percentile is not out of the realm of possibility in the future.

### 10 measured improvement strategies

To lead the process of improving nurse staffing plans, 10 areas need to be understood:

**1. Understand demand drivers.** The drivers for clinical care staffing should be patient-related activities such as care, medication delivery and information dissemination. This includes applying medical care, consulting with patient and family, referrals with other professionals, documentation, preparation and many other value-added activities. Most of these activities are driven by the number of patients, and in the business world we would refer to these as fixed activities. A number of activities are variable and occur daily or based on a patient routine. They include admissions, discharges, X-rays, blood draws or any other singular procedure not directly related to the number of patients.

The concern with measuring professional staff in their daily activities mostly lies in the unpredictability of the work elements from day to day or even hour to hour. But research has shown that nursing activities are not nearly as unpredictable as perceived. In fact, when the work elements are broken down into appropriate categories — such as assessments, giving medication and patient charting — coupled with a clinical level of care category based on level of complexity, average times to complete work elements have a tight

## SOLID PREDICTIONS

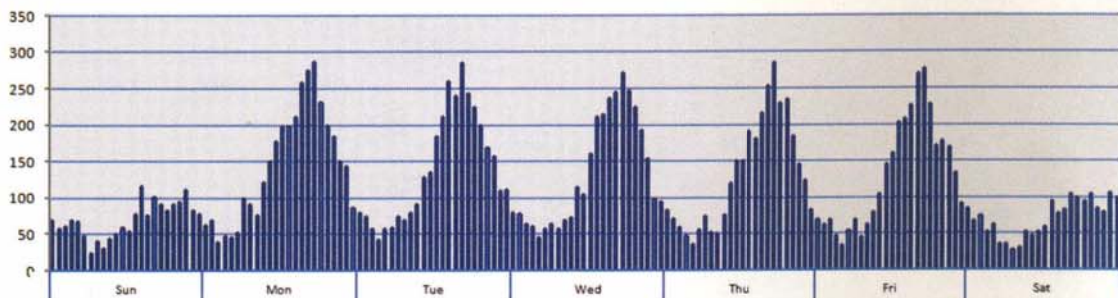


Figure 1. Total admissions by day of week and hour of day from Jan. 1, 2009 to Aug. 28, 2010

standard deviation. These measured averages in the defined categories allow a nurse staffing model to be accurate enough to develop nurse staffing assignments.

Understanding when work activities take place throughout the day lets the staffing model better fit the nurse staffing assignments on a daily basis. For example, research has shown that admissions and discharges are two very predictable fixed activities. Figure 1 shows the consistency of when admissions occur.

**2. Clearly defined goals.** Most healthcare organizations have staffing ratios based on anticipated patients for their staffing plans. These ratios often are established at a high level and become difficult to challenge, let alone adjust. This inability to allow true flexibility in nurse scheduling to match demand is common. Healthcare organizations that aim for a better bottom line should, first off, make their nurse staffing model more accurate and more flexible.

Patient-centered care and customer satisfaction must remain the primary goal, but cost reduction and patient-centered care are not mutually exclusive. However, understaffing could force the organization to turn away new patients by closing down units, even the emergency department, to protect current patients. This is detrimental to the organization. This missed opportunity for business also sends a negative message to the community. Therefore, most healthcare organizations have been overly cautious in their staffing models. Management staffs for peak workload demand and carries unnecessary overhead during lower demand periods. But overstaffing can hamper morale because most nurses prefer to take care of their patients rather than remain idle.

Balancing this requires a staffing model that allows adequate flexibility to meet changing activity demands on an hourly basis. The cost savings opportunity sits between the peaks and valleys of the daily workload demand.

**3. Proper plan and use of flex pool.** Healthcare organizations typically have a flexible pool of professionals. In practice, most organizations use the flexible pool to fill in for vacations, sick time and general emergency needs rather than for true strategic planning. Using a nursing pool properly would make overstaffing unnecessary.

For example, one healthcare organization used a staffing model for a 60 percent census rather than for an 80 percent census. This organization used the flex pool to supplement departments where demand was above the planned census level. This eliminated overstaffing and guaranteed that the patient-to-nurse ratio was at the most effective level for each hour of the day.

The primary concern for developing a large nursing pool

is how long it takes to train and develop nurses so they can work in any unit. There will be a transition phase where nurses will be learning new skills to maximize their flexibility, but that is perfectly acceptable. Changing a nurse staffing model will not happen overnight, but a series of calculated steps will prevent shock to the current system. Each success will build upon the previous success, which will allow for adjustments to be made and the nursing pool to develop slowly.

**4. Crossing functional boundaries.** In most healthcare organizations, nurses are hired into a department and report to that department each day. This is done for ease of management and for reasons related to clinical capabilities to best serve the patient. Part of the nurse staffing model developed for the hospital being studied included more flexibility to assign nurses to different units.

Some view cross-functional boundaries as a difficult business practice, but it happens often to handle vacations, people calling in sick and excessive peak work assignments. This begs the question: If crossing boundaries can occur successfully in these isolated incidents, why couldn't it work in a better defined, more organized staffing process? Trials showed that in most cases, though not all, moving nurses from one unit to another was perfectly feasible.

Pooled nurses are essential to a truly flexible nurse staffing model. The addition of cross-functional nursing efforts adds a second level of flexibility to the nurse staffing model that allows for an even better fit to the workload demand drivers on an hour-by-hour basis.

**5. Schedule incentives.** Schedules are a tricky planning tool. Traditionally, using them as an employment incentive helps retain valuable employees. This strategy may include weekend and shift pay increases, longer and fewer scheduled workdays, and on-call opportunities. These incentives can be valuable management tools to engage healthcare professionals on the importance of schedule adjustments, flexible responsibilities and cost containment.

Healthcare professionals have varied scheduling demands and priorities. These may include blocks of time off, overtime, varied work assignments, routine work assignments, and a wide range of opportunities to meet work and home schedules. These requirements offer opportunities to use staffing models to meet these desires and the cost containment demands of flexible scheduled hours.

**6. Visual measurement.** People like to perform, and cost performance is no different in healthcare. The key is to provide recognition for performance. A simple tool of recognition is visual measurement. This requires that

performance in each area is measured visually, reported and explained for the team in a physical location prominently displayed for employees but hidden from customers.

Visual measurement ensures a level of communication between individuals, shifts and departments concerning critical business performance. This communication includes performance measures, but it also can provide the actual responses to variances, individual suggestions and necessary actions for improvement. The response to these practices encourages problem solving, process simplification, employee motivation and cost containment.

**7. Match roles and classifications.** The clinical care activities are made up of a wide range of activities, decisions and skills. The breakdown of these activities is often a complex, intertwined and moving target of time requirements. If this did not have to be the case and work activities could be defined and measured clearly, it would offer a significant chance to use professional resources better by aligning skills and expertise with appropriate tasks. This would create a more pleasant work environment while reducing costs.

At this hospital, engineers were able to define work elements and their associated time accurately through observation and work measurement. From there, the elements were defined based on skill set required. Then, the nursing managers met to determine which activities best fit each professional resource, including charge nurses, staff nurses, nursing assistants and patient care aides. In some unique instances, the study revealed that certain tasks could be performed by two types of professional resources. This created synergy among the team and improved efficiency. By properly aligning the work elements with the role of each position, the workplace became more organized, morale was enhanced and staffing costs were improved.

**8. Ensure clinical professionals understand staffing measurement.** Clinical professionals strive to make sure that the patient is taken care of in the best way, but they also want the organization to succeed on a financial level. In fact, they will try almost anything to improve the organization if they believe the change has a high probability of success. When a new process fails, it's usually because the clinical professionals don't understand the reason for the change and its contribution to organizational improvement.

If not explained properly, staffing measurement can sound like a set of metrics to tell the nurses where they are underperforming. In actuality, staffing measurement is an indicator that shows how well the nurse staffing model is performing in terms of flexibility and accuracy. It does not

## STANDARDIZING DATA FOR HEALTHCARE LOGISTICS

Industrial engineering professors at the University of Arkansas conducted a survey that shows the healthcare industry is coming close to adopting global data standards for its supply chains, but nearly a third of the respondents have not started getting ready to adopt them.

Researchers at the University of Arkansas Center for Innovation in Healthcare Logistics found that 68 percent of survey respondents were moving toward integrating global data standards into their supply chain. The center and its partners talked to healthcare providers, group purchasing organizations, device manufacturers and wholesaler/distributors.

Industrial engineering faculty members Heather Nachtmann and Edward Pohl, who conducted the survey, found that 90 percent of the respondents who were moving toward adoption of a data standards system are implementing GS1 standards. And 51 percent of these organizations planned to implement Global Location Numbers by the end of the year. GS1 Healthcare, an international association that developed a system of standards to improve healthcare logistics, has called for the adoption of these numbers by the end of 2010. The numbers have a location reference that can link products to a physical location, such as a warehouse or shelf in a store, or a legal location, such as a company or customer.

reflect on the effort of the clinical professionals, instead reflecting on the management team's ability to set up a robust process to meet the needs of the patients.

In addition, clinical professionals must understand what the measurements are saying about the process. A general understanding of patient days and nursing hours per patient day needs to be common knowledge throughout the organization. An informed work force creates a level of engagement that is necessary for true organizational improvement.

**9. Follow-up on the measurement.** Not one healthcare organization will suggest that measurement of staffing performance is not occurring on a timely basis. Unfortunately, measuring staff planning performance as a true

management tool certainly lacks the indicators that can drive critical, timely decisions and follow-up. The routine of reporting census and staffing follows a process of data entry and archiving without timely reporting of labor variances. Quite often these variances become part of the budget for the next year's performance.

The need for specific measurement follow-up is a critical and often missing practice in healthcare organizations. This follow-up should pursue the following three guidelines to ensure meaningful success.

- Healthcare labor performance should be summarized on a daily basis and reported back to the decision makers who can control these data points. The department leaders should respond to trends, variances and a constant effort for improved performance.
- The reports should be summarized and reported to the lowest level of decision making to ensure performance data is owned by that leader. Combining data across wide departments, shifts or other organizational categories only provides unnecessary smoothing, which competes with individual department accountability.
- Friendly competition with goal-setting and feedback has been a powerful tool for production organizations to achieve real bottom-line results. This feedback can offer performance information to self-directed targets by the department, while educating and challenging the decision makers and their teams. This practice certainly applies in healthcare organizations and offers a simple tool to ensure engagement and buy-in.

Finally, top leadership must expect this feedback and respond with timely feedback to opportunities and successes. A successful leader will gather information from the same location and feedback loop that is being provided to the teams. This may require leaders to visit department locations and observe charts in their display locations across multiple shifts. They also must understand the implications of their feedback in terms of positive reinforcement and guidance.

**10. Be prepared to lead change.** The transformation of professional healthcare staffing is a challenge for leadership to address. These challenges must be led from the top and shown to be an important measure of healthcare and business success. Leadership continually must advocate the need for measurement, provide positive reinforcement of successes and challenges, and make adjustments when necessary.

Another critical role for the change leadership is to keep everything simple. Complexity in the current nurse staffing procedures often leads to unrealistic expectations of adjustments, impossible follow-up, and generally pushes this practice to a very low level of management priority. The change leadership must ensure models of nurse staffing are simple and understood by all of the personnel involved. Measures and feedback loops must be straightforward and timely, and adjustments must be supported by leadership and effortless for the employees.

## Conclusions

The challenge of clinical healthcare staffing is not easy to tackle. In fact, it's one that most healthcare organizations have set on the back burner. The difficulty lies in defining the work content of the clinical professionals and then getting them to believe that their work content can be measured accurately. Once those two steps have been navigated successfully, the model development and implementation becomes attainable.

As the 21st century presses on, healthcare will become more competitive on cost, quality, speed and customer service. The most logical starting point to improve cost while enhancing the other three avenues of the business is to take a good look at improving the current nurse staffing model. Bottom-line results are sure to follow as clinical professionals become more flexible and better utilized. ~

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