Lessening the Negative Impact of Human Factors
Linking Staffing Variables & Patient Outcomes
In the United States, healthcare is a $2.9 trillion industry, costs $9,255 per capita and consumes 17.4% of the GDP. Healthcare is big business, and the way the entire industry conducts business is changing. While hospitals have always been in the business of providing patient care, the care delivery and payment models are undergoing an enormous paradigm shift. It’s no longer about the number of services provided, but instead about the quality of care delivered.

In January, 2015, the US Department of Health and Human Services (HHS) announced a focused, accelerated shift from fee-for-service to pay-for-performance. That announcement came with measurable goals and an aggressive timeline: 85% of all traditional Medicare payments tied to quality or value by 2016 and 90% by 2018.

Private insurers are also moving away from the fee-for-service model. In early 2015, UnitedHealth announced that they are expecting a 20% increase in value-based reimbursements, with that number growing even more in subsequent years.
One factor that has an enormous impact on the quality of care is the occurrence of medical errors. With some experts estimating an astonishing 400,000 deaths caused by medical errors each year and the cost of medical errors topping $17 billion annually, reducing the number of medical errors is a clear priority for an industry driving towards improved outcomes and better quality.

Understanding the factors that lead to medical errors provides a framework for improvement. As part of its mission to improve healthcare, the Joint Commission reviews sentinel events, defined as “any unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof.” Their findings show that the most frequently cited root cause for sentinel events reported by Joint Commission accredited hospitals is “human factors,” which includes staffing levels, skill mix, competency assessment, fatigue and more.
Five Most Frequently Identified Root Causes of Sentinel Events Reviewed by The Joint Commission by Year:

The majority of events have multiple root causes.

<table>
<thead>
<tr>
<th>Year</th>
<th>Human Factors</th>
<th>Leadership</th>
<th>Communication</th>
<th>Assessment</th>
<th>Information Management</th>
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<td>203</td>
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<tr>
<td>2014</td>
<td>155</td>
<td>72</td>
<td>72</td>
<td>72</td>
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</table>

Number of respondents:
- 2012: 901
- 2013: 887
- 2014: 764

The Joint Commission
How Staffing Variables Impact Patient Outcomes

A growing body of research shows the impact that staffing variables have on a wide range of patient outcome metrics. With so many staffing variables impacting patient outcomes, determining a course of action can initially be daunting. The increasing prevalence of reliable workforce analytics can provide a data-driven solution to the dilemma. Long-term workforce management strategies and short-term staffing decisions have a profound impact on patient outcomes.

**PATIENT FALLS**

- An additional hour of RN care per patient day reduced the fall rate by 2.8%.
- Patient falls are 3.36 times more likely when nurses work voluntary overtime.

**HOSPITAL ACQUIRED INFECTIONS**

- For each additional patient a nurse is assigned, there was approximately one additional infection per 1,000 patients.
- Hospital-acquired infections are 3.39 times more likely when nurses work more than 40 hours per week.

**HOSPITAL ACQUIRED PRESSURE ULCER (HAPU)**

- HAPU rates could be reduced by 11.4% by simultaneously increasing the percentage of hours supplied by RNs from 60% to 70% and increasing the average experience of RNs by five years.
- HAPU are 3.50x more likely when nurses work voluntary overtime.
PATIENT FALLS

- An additional hour of RN care per patient day reduced the fall rate by 2.8%. [8]
- Patient falls are 3.36 times more likely when nurses work voluntary overtime. [9]

PATIENT MORTALITY

- The risk of death increased 2% for each below-target shift (low staffing) and 4% for each high-turnover shift (patient churn). [16]
- An increase of 1 RN per 1,000 inpatient days decreased mortality by 4.3%. [19]
- Nurse-to-patient ratios of 1 to 4.95 or lower reduced heart failure readmissions by 7%, acute myocardial infarction readmissions by 6% and pneumonia readmissions by 10%. [20]
- Each one patient increase in the hospital’s average pediatric staffing ratio increased a surgical child’s odds of readmission by 48% and a medical child’s odds of readmission by 11%. [21]

MEDICATION ERRORS

- For every 20% decrease in staffing below the staffing minimum, medication errors increase by 18%. [17]
- Medication errors are 3.71 times more likely when nurses work more than 40 hours per week. [18]

PATIENT READMISSIONS

- Increases in RN staffing in general hospital units have resulted in a reduction of 5.7% in patient days. [4]
- A one-year increase in the average tenure of RNs on a hospital unit was associated with a 1.3% decrease in length of stay. [5]
- Hospital-acquired infections are 3.39 times more likely when nurses work more than 40 hours per week. [11]
- For each additional patient a nurse is assigned, there was approximately one additional infection per 1,000 patients. [10]

HOSPITAL ACQUIRED PRESSURE ULCER (HAPU)

- HAPU are 3.50x more likely when nurses work voluntary overtime. [12]
- HAPU rates could be reduced by 11.4% by simultaneously increasing the percentage of hours supplied by RNs from 60% to 70% and increasing the average experience of RNs by five years. [13]
Optimizing Staff to Improve Patient Outcomes

With the potential to impact every patient outcome metric, workforce management and staffing decisions are critical. In fact, a recent Becker’s survey revealed that 81% of healthcare executive respondents consider workforce management a top priority. That survey probed deeper into the tactics that the healthcare executives felt were having the biggest impact on improving clinical outcomes and reducing medical errors and never events, and three emerged as frontrunners:

Staffing skill and competency mix
This initiative requires the ability to utilize workforce analytics to make better short-term and long-term staffing decisions. In the short-term, staffing plans should be based on the optimal skill mix so that staff can be deployed to the right place at the right time to balance both care needs and budget constraints, while ensuring patient satisfaction.

In the long-term, decisions need to be made to determine how to recruit, retain and develop a workforce with the right competencies and skills to meet both current and future demands. Identifying the specific staff needs across the health system and then how to engage, empower and ensure the highest potential performance is core to establishing quality of care improvements.

Acuity-based staffing
New care delivery models are changing how and where care will be delivered, and the variations in location and type of care needed will be significant. An acuity-based

Please indicate which two workforce management tactics your organization views as having the biggest impact to improve clinical outcomes: *(Select 2)*

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
<th>Respondent Percentage</th>
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<tbody>
<tr>
<td>Overtime monitoring and management</td>
<td>13</td>
<td>14%</td>
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<tr>
<td><strong>Staffing skill and competency mix</strong></td>
<td><strong>66</strong></td>
<td><strong>69%</strong></td>
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<td>Staff satisfaction</td>
<td>25</td>
<td>26%</td>
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<tr>
<td><strong>Acuity-based staffing (staffing based on patient need)</strong></td>
<td><strong>46</strong></td>
<td><strong>48%</strong></td>
</tr>
<tr>
<td>Learning, development &amp; competencies management</td>
<td>41</td>
<td>43%</td>
</tr>
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</table>

Becker’s Healthcare 2015 Survey “Aligning Organizational Goals with Workforce Management Initiatives”
Please indicate which workforce management tactics your organization views as having the biggest impact to reduce medical errors and never events: (Select 2)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
<th>Respondent Percentage</th>
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</thead>
<tbody>
<tr>
<td>Overtime monitoring and management</td>
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<td>17%</td>
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<tr>
<td><strong>Staffing skill and competency mix</strong></td>
<td><strong>65</strong></td>
<td><strong>68%</strong></td>
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<td>Staff satisfaction</td>
<td>20</td>
<td>21%</td>
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<td>Acuity-based staffing (staffing based on patient need)</td>
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<tr>
<td><strong>Learning, development &amp; competencies management</strong></td>
<td><strong>53</strong></td>
<td><strong>56%</strong></td>
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Becker's Healthcare 2015 Survey “Aligning Organizational Goals with Workforce Management Initiatives”

staffing initiative takes into account that not all nurses are equal, patients are all different and care delivery models are changing. Within this new paradigm, ratios can provide a baseline, but they are only a starting point for developing effective, safe staffing plans.

Instead, acuity-based methodologies rely on objective, reliable data and sophisticated analytics to make staffing decisions that are based on evidence and outcomes. A sophisticated acuity-based staffing strategy takes into account the characteristics of the nurse (such as experience, education, competencies and potential fatigue factors), specifics about the patient (such as complexity and family dynamics), and information about the environment (such as availability of support staff and layout of the unit).

**Learning, development and competencies management**
A robust talent management strategy includes the ability to continuously evaluate competencies for relevancy and readiness, identifying areas for future development necessary to meet the organization’s strategic objectives. By aligning each employee’s knowledge, skill levels and certifications with the immediate and evolving needs of the organization, the health system achieves higher efficiency while mitigating risk. That leads to better patient outcomes.

A comprehensive learning management strategy takes into account the management, measurement and tracking of learning and training. Then, the ability to analyze that information allows for data-driven decisions that help to better develop, retain, hire or contract talent. In addition, workforce metrics can be used for trend analysis that helps uncover any gaps in the organization and identify additional workforce management strategies that can be implemented to deliver better patient care.
Leveraging Automation

While healthcare executives recognize the importance of workforce management, the majority are not using automation to help manage their workforce optimization efforts beyond cost containment. In fact, the Becker’s survey uncovered that only slightly over half of respondents are using automation to enable overtime monitoring and management.

The use of automation drops off even further for initiatives that enable staffing based on patient needs, staff satisfaction or talent management. However, as health systems continue to develop more robust staffing and workforce management strategies in response to clinical and financial demands, the use of workforce analytics and automation will continue to expand.

Please indicate which workforce management tactics your organization is enabling through automated workforce management software: (Select all that apply)

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Count</th>
<th>Respondent Percentage</th>
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<tbody>
<tr>
<td>Overtime monitoring and management</td>
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<td>51%</td>
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<td>Acuity-based staffing (staffing based on patient need)</td>
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<td>Learning, development &amp; competencies management</td>
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<td>Staffing skill and competency mix</td>
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<td>Staff satisfaction</td>
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Becker’s Healthcare 2015 Survey “Aligning Organizational Goals with Workforce Management Initiatives”
Healthcare is unlike any other business – it’s about people caring for people. So, it comes as no surprise that human factors can be traced as a root cause of the majority of never events. Understanding that connection is only the first step in making progress to reduce errors and improve clinical outcomes. Action must be taken to overcome those human factors and improve the quality of care.

The link between staffing and patient outcomes is indisputable. In an industry that is striving to improve patient outcomes while simultaneously driving down costs, the impact of each health system’s workforce management strategy will be magnified. Fortunately, the increasing availability of reliable workforce analytics will empower healthcare organizations to achieve workforce optimization, propelling them to a successful synergy between patient outcomes and cost containment.
About API Healthcare

API Healthcare (www.apihealthcare.com) is focused on workforce optimization solutions exclusively for the healthcare industry. The company's staffing and scheduling, patient classification, human resources, talent management, payroll, time and attendance, business analytics, and staffing agency solutions are used by more than 1,600 health systems and staffing agencies. Founded in 1982, API Healthcare has been rated by KLAS in the Top 20 Best in KLAS Awards Report (www.KLASresearch.com) as the top time and attendance provider system for the last 13 years (2002-2014) and the top staffing and scheduling solution in 2012, 2013 and 2014.

About GE Healthcare

GE Healthcare provides transformational medical technologies and services to meet the demand for increased access, enhanced quality and more affordable healthcare around the world. GE (NYSE: GE) works on things that matter - great people and technologies taking on tough challenges. From medical imaging, software & IT, patient monitoring and diagnostics to drug discovery, biopharmaceutical manufacturing technologies and performance improvement solutions, GE Healthcare helps medical professionals deliver great healthcare to their patients.

20 McHugh, M., & Ma, C. “Hospital nursing and 30-day readmissions among Medicare patients with health failure, acute myocardial infarction, and pneumonia.” Medical Care, 2013; 51(11), 52–59.
23 Ibid.
24 Ibid.

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