Optimal Nurse Staffing to Improve Quality of Care and Patient Outcomes: Executive Summary

September 2015

Prepared for the
American Nurses Association

Prepared by:
Avalere Health LLC

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This research was sponsored by the American Nurses Association.

EXECUTIVE SUMMARY

Background and Rationale

Expanding access to healthcare, improving the quality of care, and reducing cost have long been goals for "reform" of the U.S. healthcare system.[1] The Affordable Care Act (ACA), passed in 2010, has implemented new models of healthcare delivery and payment aimed to improve quality and reduce cost. Central to health reform is the emphasis on value-based healthcare. New programs reward or penalize hospitals based on their ability to meet certain quality, outcomes, and cost metrics. As a result, hospitals are exploring many approaches to improve quality and patient outcomes and contain costs.

As nurses comprise the largest clinical subgroup in hospitals, a common reaction to cost-containment pressures is to reduce professional nurse labor hours and their associated costs. This strategy, however, is shortsighted as appropriate nurse staffing levels are essential to optimizing quality of care and patient outcomes in this era of value-based healthcare.

Methods

In this, the first in a series of papers that makes the case for nursing value, American Nurses Association (ANA) collaborated with Avalere to explore the clinical case for using optimal nurse staffing models to achieve improvements in patient outcomes. Avalere conducted a targeted review of recent published literature, government reports, and other publicly available evaluations of nurse staffing and patient outcomes. Avalere also convened a panel of leading nurse researchers, thought leaders, managers, and those in practice from across the country to provide additional context and to help identify best practices in nurse staffing. While this analysis focused on nurse staffing in acute care hospitals, the principles can be applied to other settings such as post-acute care.

Key Findings

- Optimal staffing is essential to providing professional nursing value. Existing nurse staffing systems are often antiquated and inflexible. Greater benefit can be derived from staffing models that consider the number of nurses and/or the nurse-to-patient ratios and can be adjusted to account for unit and shift level factors. Factors that influence nurse staffing needs include: patient complexity, acuity, or stability; number of admissions, discharges, and transfers; professional nursing and other staff skill level and expertise; physical space and layout of the nursing unit; and availability of or proximity to technological support or other resources.

- Published studies show that appropriate nurse staffing helps achieve clinical and economic improvements in patient care, including:
  - Improvements in patient satisfaction and health-related quality of life
  - Reduction/decrease in:
    - Medical and medication errors
    - Patient mortality, hospital readmissions, and length of stay
    - Number of preventable events such as patient falls, pressure ulcers, central line infections, healthcare-associated infections (HAIs), and other complications related to hospitalizations
    - Patient care costs through avoidance of unplanned readmissions
    - Nurse fatigue, thus promoting nursing safety, nurse retention, and job satisfaction, which all contribute to safer patient care.
- Organizations such as ANA support state and federal regulation and legislation that allows for flexible nurse staffing plans. In addition to promoting flexible staffing plans, ANA and like-minded constituents support public reporting of staffing data to promote transparency and penalizing institutions that fail to comply with minimal safe staffing standards.
- Further, ANA has introduced a legislative model in which nurses themselves are empowered to create staffing plans. Optimal staffing is much more than just numbers, and direct care nurses are well equipped to contribute to the development of staffing plans.

To conclude, appropriate nurse staffing is associated with improved patient outcomes. With the increased focus on value-based care, optimal nurse staffing will be essential to delivering high-quality, cost-effective care. Implementation of a legislative model will help set basic staffing standards, and encourage transparency of action through public reporting and imposing penalties on institutions that fail to comply with minimal standards.

Note: A glossary of nurse staffing terms is provided in Appendix A.

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As nurses comprise the largest clinical subgroup in hospitals, a common reaction to cost-containment pressures is to reduce professional nurse labor hours and their associated costs. This strategy, however, is shortsighted as appropriate nurse staffing levels are essential to optimizing quality of care and patient outcomes in this era of value-based healthcare.

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Key Findings

- Optimal staffing is essential to providing professional nursing value. Existing nurse staffing systems are often antiquated and inflexible. Greater benefit can be derived from staffing models that consider the number of nurses and/or the nurse-to-patient ratios and can be adjusted to account for unit and shift level factors. Factors that influence nurse staffing needs include: patient complexity, acuity, or stability; number of admissions, discharges, and transfers; professional nursing and other staff skill level and expertise; physical space and layout of the nursing unit; and availability of or proximity to technological support or other resources.

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To conclude, appropriate nurse staffing is associated with improved patient outcomes. With the increased focus on value-based care, optimal nurse staffing will be essential to delivering high-quality, cost-effective care. Implementation of a legislative model will help set basic staffing standards, and encourage transparency of action through public reporting and imposing penalties on institutions that fail to comply with minimal standards.

Note: A glossary of nurse staffing terms is provided in Appendix A.

I. IMPERATIVE FOR CHANGE

The influx of new patients covered under the Affordable Care Act (ACA) and the growing elderly population are bringing additional cost-containment pressures to the U.S. healthcare system. These changes are also changing the nature and complexity of nursing care. Reducing professional nurse labor hours and their associated costs may be viewed as a potential cost-containment measure for hospitals. However, this strategy has a negative impact on safety for both the patient and the nurse, and ultimately leads to an increase in the cost of care.

Expanding access, improving the quality of care, and reducing the cost of care have long been goals for "reform" of the U.S. healthcare system.[1] Much time and effort has been focused on physician and hospital care, but evaluation of other components of professional services, such as nursing, has been less emphasized.

- **The 2010 passage of the ACA and other health reform measures have added layers of complexity to the U.S. healthcare system.** Adding more covered lives into the system, instituting new quality programs, and requiring improved outcomes with fewer resources have led to increased pressure on hospitals, payers, patients, and healthcare professionals, including nurses. Nurses may experience these pressures more acutely as they are often functioning at the point of care 24 hours a day, 7 days a week, while interacting with patients, families, payers, and all members of the healthcare team.
- **Provisions of the ACA are expected to negatively impact hospital margins and bring increased cost-containment pressures.** The Medicare Trustees predict that by 2019, 5 percent more hospitals will experience negative total margins and that by 2040 approximately half of all hospitals will have negative total margins.[2,3]
- **The aging U.S. population will shift the care focus from acute to chronic disease management, and from acute care to ambulatory and community care settings.** By 2030, 72.1 million Americans will be age 65 years or older (versus 36 million in 2009).[4] Comorbidities associated with an older population make the level of care required for many elders more complex, regardless of the setting of care.
- **The Institute of Medicine (IOM) has recognized that appropriate nurse deployment, training, and education is critical to patient safety.** The 2001 IOM report, *Crossing the Quality Chasm*, stated that "fundamental changes are needed in the organization and delivery of health care in the United States."[5] Specific to nursing,

even sources that were once equivocal have come to this point of view. In 1996, IOM concluded that the evidence was insufficient to determine whether there was a causative relationship between nurse staffing and quality of care and that more research was needed.[6] Since then, the relationship between hospital nurse staffing and patient outcomes has been more thoroughly and convincingly well documented, with literature connecting nurse staffing to patient mortality, failure to rescue (i.e., death following the development of a complication), readmissions, healthcare-associated infections (HAIs), patient satisfaction, and a number of condition-specific outcomes. In its much later work, IOM concluded that appropriate nurse staffing is critical to patient safety. Further, all factors point to the need for efficiently deployed nurses, working to the full extent of their education and training across varying settings of care.[7,8] Highlights from three of the IOM's more recent major nurse staffing reports can be seen below in **Table 1**.

Table 1. IOM Reports Relating to Quality and Nursing Care—Key Points

IOM Report Title (Year)	IOM Conclusions
Nursing Staff in Hospitals and Nursing Homes. Is It Adequate? (1996)[9]	The growing elderly population, especially the older elderly, will increase admissions to inpatient hospitals and nursing homes. This situation, combined with the rising acuity of patients in hospitals and nursing homes, will exacerbate the long-standing problems of staffing, including the paucity of appropriately educated and trained professional nursing personnel.
Keeping Patients Safe: Transforming the Work Environment of Nurses (2004)[7]	The typical nurse work environment is characterized by many serious threats to patient safety. To counter threats and reduce medical errors, IOM recommended changes to workforce deployment, process design, and leadership.
The Future of Nursing: Leading Change, Advancing Health (2010)[8]	To meet the increase in healthcare demands brought about by health reform, IOM recommended that nurses should: 1) practice to the full extent of their education/training; 2) achieve higher levels of education/training through an improved education system that promotes seamless academic progression; and 3) be full partners, with physicians and other health professionals, in redesigning U.S. healthcare. IOM also concluded that effective workforce planning and policy making will require better data collection and an improved information infrastructure.

- **Nursing care has changed dramatically to encompass surveillance and coordination of care for complex patients in a highly intense, often chaotic care environment.** Research findings indicate that strategies to improve teamwork, communication, excessive workloads, poor personnel deployment, and flows in patient acuity and volume are all needed to create the conditions necessary to minimize the likelihood of missed nursing care, which may partially explain the link between nurse staffing and patient morbidity and mortality.[10]
- **Reducing nurse labor costs may be viewed as a viable solution to resolve cost issues but can have a negative impact on care delivery and outcomes and ultimately jeopardize reimbursement.** Nurses currently represent the largest clinical subgroup in hospital systems, at approximately 40 percent of operating costs.[11] Reducing the number of nurses employed by a hospital system may be an attractive solution to reduce labor costs in the short term, but can have unintended negative clinical quality and financial consequences for patients and providers in the long term.[12] For example, having sufficient nursing staff ensures an appropriate level of attention to patient admissions, discharges, and daily nursing activities, which are critical factors in controlling costs and optimizing revenue.

II. VALUE OF APPROPRIATE NURSE STAFFING

There is extensive empirical research establishing the link between inadequate nurse staffing and negative patient outcomes. Similarly, a large body of literature demonstrates that use of RNs, with skills matched to patient need, and deployed in an environment and conditions conducive to good care, results in the provision of high-quality care.

The link between inadequate nurse staffing and negative patient outcomes is well established: Poor, inadequate nurse staffing levels leads to higher rates of adverse outcomes, including hospital-acquired conditions (HACs), falls, hospital readmissions, and patient mortality due to surgical complications.[8,13,14,15,16] Inadequate staffing also leads to missed nursing care, in which required standard patient care and surveillance cannot be delivered because of the absence of nurse staffing resources, material resources, and appropriate and timely communication.[17] Staffing gaps result in the inability to provide needed care, leading to staff and patient injuries, nurse burnout, and increased turnover.

In addition to significant patient care consequences, increased nurse turnover contributes to waste of healthcare dollars. A number of national studies have estimated that the average cost of replacing an RN ranges from $22,000 to over $64,000.[18,19,20,21,22,23] These figures include termination costs; costs of unfilled positions; advertising and recruiting costs; new staff hiring costs; and new staff training and orientation costs. In aggregate, the average hospital is estimated to lose about $300,000 per year for each percentage point of annual nurse turnover.[24] As the average hospital RN turnover rate is 16.4%, hospitals will pay nearly $5 million dollars per year in costs associated with nurse turnover.[25]

Similarly, a large body of literature is focused on the association between adequate staffing and good patient outcomes. The Agency for Healthcare Research and Quality (AHRQ) summarized that literature in a 2007 health technology assessment and concluded that numerous studies have found a significant association between nurse staffing levels and patient outcomes.[13] A summary of the most recent evidence is provided in this section.

Reducing Inpatient Mortality

Beginning with the landmark Aiken[26] and Needleman[27] studies performed in 2002 and continuing with Needleman's more recent work in 2011[28] research has shown an association between nurse staffing and mortality rates. A summary of recent evidence on nurse staffing and inpatient mortality is presented in **Table 2**.

Table 2. Impact of Appropriate Staffing on Inpatient Mortality

Finding	Supporting Evidence
Inpatient mortality rates can be lowered by increasing RN staffing	• An increase in nurse to patient staffing ratios leads to reductions in hospital-related mortality in hospital ICUs and postsurgical settings, based on findings from a systematic literature review.[29] Furthermore, a meta-analysis concluded that an increase in RN full-time equivalent staffing per patient day was associated with a reduction in hospital-related mortality in ICUs and in both surgical and non-surgical patients.[13] • A significant association was found between mortality and understaffed nursing shifts in a large academic medical center, reinforcing the need to match staffing with patients' needs for nursing care.[41] • A 10% increase in proportion of ICU nurses with bachelor's degree in nursing led to a 2% reduction in the odds of 30-day mortality in mechanically ventilated Medicare patients.[30]
Nurse work environment associated with reduction in patient mortality	• Better work environments for nurses decreases the odds of both inpatient mortality and failure to rescue by 9% and 10%, respectively.[31] • Patients admitted to Magnet® hospitals, which have highly qualified and educated nurses and practice environments supportive of high-quality care, had 14% lower odds of mortality and 12% lower odds of failure to rescue in comparison with patients admitted to non-Magnet hospitals.[32,33] • Emerging Magnet hospitals were associated with 2.4 fewer deaths per 1,000 patients and 6.1 fewer failures to rescue per 1,000 patients in comparison with non-Magnet hospitals, indicating significant improvements over time in the quality of the work environment, and in patient and nurse outcomes vs. non-Magnet hospitals.[34]

Reducing Hospital Readmissions

Hospitals are acutely interested in avoiding unplanned hospital readmissions because the cost of treating the readmitted patient may no longer result in supplemental reimbursement. Additionally, a high readmission rate within a hospital system can be perceived as an overall indicator of poor quality care, and significant financial penalties may ensue.[35] In 2013, 17.5 percent of Medicare beneficiaries were readmitted to a hospital within 30 days following

discharge.[36] These readmissions cost Medicare an estimated $26 billion per year, $17 billion of which is attributed to avoidable readmissions. In a 2008 study, 17.5% of adult hospital patients reported that they did not receive adequate written instructions at discharge on what symptoms or health issues to look for, or how to care for themselves adequately at home.[37] Nurse staffing plays an important role by ensuring that the nurse is provided adequate time and resources to prepare each patient for discharge.

Two key themes emerge from the research:

- **Inadequate nurse staffing has been linked to higher rates of readmission**
- **Improvements in nurse staffing levels and nurse work environments can contribute to the prevention of avoidable and costly readmissions**

The rate of 30-day readmissions in the Medicare population has been steadily declining since the passage of the ACA. Improvements in staffing levels and nurse work environments can contribute to the further reduction of these avoidable and costly readmissions. Hospitals should invest in the appropriate number of nursing care hours to ensure that patients receive the information and education needed prior to discharge to effectively manage their care at home. The cost associated with increased nursing hours would be offset by the cost savings realized through the reduction in avoidable readmissions. A summary of recent evidence is provided in **Table 3** below.

Table 3. Impact of Appropriate Staffing on Hospital Readmissions

Finding	Supporting Evidence
Improvements in nurse work environments and nurse staffing levels may help prevent avoidable and costly readmissions and associated penalties	• Among Medicare beneficiaries with heart failure, acute myocardial infarction (MI), or pneumonia, each additional patient added to a nurse's average caseload increases odds of 30-day readmission 6%-9% due to poor nurse working environment and staffing.[38,39] Similarly, among Medicare surgical patients, each additional patient added to the nurse's workload increases the odds of 30-day readmission significantly. Conversely, patients who receive care in "better" nurse work environments have lower odds of readmission. The two main attributes of the nurse work environment associated with readmission are administrative support to nurses and nurse-physician relationship.[40] • Hospitals staffed with 8 RN hours per adjusted patient day have 25% lower odds of receiving readmissions penalties for Medicare patients treated for heart failure, MI, and pneumonia when compared to similar hospitals staffed with 5.1 RN hours per adjusted patient day.[41]

Finding	Supporting Evidence
	• Missed standard nursing care activities during a heart failure patient's hospitalization, such as teaching, care-coordination, care planning, and treatments, are associated with an increased odds of readmission of 2%-8%, after adjusting for patient and hospital characteristics. This suggests that providing nurses with sufficient time and resources to address various patient needs can help reduce readmission rates.[42] • Higher RN non-overtime staffing decreases the odds of readmission of medical/surgical patients by nearly 50% and reduces post-discharge emergency department visits. Hospitals could potentially reduce post-discharge utilization costs and readmissions by increasing investment in nursing care hours to better prepare patients to manage their care at home prior to hospital discharge.[43]

These findings suggest that improving nurses' work environment and enhancing nurse staffing to ensure that professional nurses have adequate time to educate patients and families prior to discharge are organization-wide reforms that could result in fewer readmissions for Medicare beneficiaries with common medical conditions. Beyond Medicare, lower nurse-to-patient ratios hold promise for preventing unnecessary hospital readmissions for all patients through more effective pre-discharge monitoring of patient conditions and improved discharge preparation.[44] Overall, the findings suggest that reductions in readmissions would result in cost savings for healthcare systems; however, the financial impact at the hospital level will be driven by the patient acuity mix, payer mix, and other factors.

Prevention of Hospital-Acquired Conditions (HACs) and Promotion of Higher Quality Care

Hospital-acquired conditions (HACs), also referred to as serious reportable events and never events, are "unambiguous and largely, if not entirely, preventable events that occur during care management or as a result of failure to follow care protocols and applies to all settings of care."[45] HACs impose a significant financial burden to the U.S. healthcare system; a high-level summary of the cost of caring for specific avoidable HACs in hospitals is presented in Table 4 below.

Table 4. Cost of Caring for Avoidable HACs in Hospitals

Type of HAC	Supporting Evidence
Patient falls	• Inpatient falls are one of the most commonly occurring adverse events impacting the recovery of older patients.[46,47,48,49,50,51,52,53,54,55] The direct medical cost of falls in older adults was $34 billion for 2013, with an average hospitalization cost of ~$17,500.[56]
Pressure ulcer (decubitus)[57,58]	• Pressure ulcers cost the U.S. healthcare system an estimated $9.1-$11.6 billion annually, with an average charge per hospital stay of $37,800.[59,60] The cost of treating a pressure ulcer is 2.5 times higher than the cost of prevention.[61]
Hospital-acquired infections (HAIs), including central line infections	• There were 648,000 patients with 721,800 hospital-acquired infections (HAIs) in U.S. acute care hospitals in 2011,[62] costing hospitals an estimated $28.4-$45 billion.[8,9] When indirect costs such as productivity losses are added, the financial impact skyrockets to between $96 billion and $147 billion annually.[63] • Central line associated bloodstream infections (CLABSI) represent 10% of all HAIs, resulting in ~71,900 infections in U.S. hospitals annually.[64,65] CLABSI cost the U.S. healthcare system an estimated $0.6-$2.7 billion annually[66] and average cost per event is upwards of $26,000.[67]

Recent evidence supports nursing's role in the prevention of HACs and promotion of higher quality care. Nurse surveillance is a critical aspect of patient safety and the prevention of medication errors, rescue situations, patient deterioration, and death.[68] Through the continuous monitoring and surveillance of patients, nurses play a critical role in the prevention of HACs. A summary of recent evidence demonstrating that an appropriate increase in nurse staffing reduces the rate of HACs is presented in **Table 5**.

Table 5. Impact of Appropriate Staffing on HACs

Finding	Supporting Evidence
Higher RN staffing levels have been shown to decrease avoidable HACs	• Higher RN staffing levels have been shown to reduce patient length of stay and decrease avoidable HACs such as inpatient falls and hospital-acquired pressure ulcers (HAPU).[69,70] Increased RN staffing was associated with 28% decreased odds of a patient experiencing cardiac arrest in the ICU, 30% decreased odds of a patient acquiring pneumonia during hospitalization, 51% decreased odds of unplanned extubation, and 60% decreased odds of respiratory failure. Furthermore, increases in RN staffing have been shown to reduce length of stay by 24%- 31%.[71] • Increasing RN care hours per patient per shift in a pediatric postsurgical unit is associated with an increase in frequency of monitoring and documented assessments. These activities resulted in an overall reduction in adverse outcomes such as HAIs.[72] • There is a significant positive association between nurse-to-patient ratios, nurse burnout (measured using the emotional exhaustion component of the Maslach Burnout Inventory-Human Services Survey instrument), and both urinary tract and surgical site infections. Hospitals in which nurse burnout was reduced by 30% had a total of 6,239 fewer infections, for an annual cost saving of more than $69 million.[73] • Magnet hospitals have lower rates of patient falls vs. non-Magnet hospitals; impact of nurse staffing on fall rates varies by hospital unit.[74]

Limitations of the Evidence

There are several limitations to the research. Various authors note that research design and staffing measures vary considerably across the literature, rendering it difficult to compare findings across studies.[13,75,76] Further, most of the current research is limited to acute care hospitals and does not include ambulatory or long-term care settings. In addition, much of the published literature relies on the comprehensive data sources available from Medicare. It therefore focuses on the Medicare population, which has disproportionately higher use of healthcare services. Non-elderly adult patients could be better studied for increased

generalization of findings. Research on other vulnerable, resource-intensive populations such as children is similarly limited. The considerable variability of quality of care and availability of resources within individual institutions is another topic worthy of additional study in the development of more nuanced findings and actions to be drawn from research.[77]

AHRQ has recommended improvements in research methods used in evaluations of nurse staffing to better establish a cause and effect relationship between staffing and patient and nurse outcomes. To develop the staffing systems of the future, one recommendation is to include a greater number of variables:

> *The number of patients a nurse cares for is not a true measure of the "'work" of the nurse. The patient flow (admissions, discharges, return from surgeries, transfers to other units, and transfers from other units) can result in nurses providing care for many more patients in a day than what is reflected in the RN hour per patient day or nurse-to-patient ratio. This significant factor was not addressed in any of the studies reviewed and should be considered as a nurse staffing measure for future studies.*[13]

Implicit in this recommendation is that an even stronger association between nurse staffing and outcomes might be found with improved research techniques that include variables beyond the number of patients and nurses included in the staffing plan. Some of the more recent research reflects this recommendation.

Cross-sectional studies of hospital-level administrative data have shown an association between lower levels of staffing of RNs and increased patient mortality. However, like AHRQ, one author noted that:

> *Such studies have been criticized because they have not shown a direct link between the level of staffing and individual patient experiences and have not included sufficient statistical controls…Some have wondered if the results are truly causal or whether other factors associated with nurse staffing—physician quality, technology, commitment to high-quality care, financial resources, differences in patient acuity or need for nursing—are the real source of observed association.*[78]

In a 2011 study funded by AHRQ, researchers used an alternative approach to address the causality question by controlling for factors identified in prior studies using variations in staff levels in a single hospital.[28] The team analyzed unit-level patient census, nurse staffing, and patient mortality data within a large academic medical center and determined that the risk of death increased with increasing exposure to nursing shifts in which actual RN hours were at least eight hours below target staffing levels or there was high patient turnover. Given the hospital had low baseline mortality, a reputation for high quality and care was delivered by the same staff, same physicians, same treatment protocols, and same technology, this study provides some of the strongest evidence that the association of staffing and adverse outcomes is causal. New research assessing programs established by the ACA are expected to add to the literature on causality.[13]

While providing important first explorations, the research does not provide translational guidance on how its findings should be instituted in practice. Additional research is needed to better understand precisely how increases in nurse staffing, specifically RNs, translate into reductions in patient care costs. Nurse managers and hospital administrators will need to work closely together to develop more fully evidence-based, budget neutral approaches to optimizing nurse labor as evidenced by improved patient outcomes. This topic will be explored in the next paper of this series.

III. CURRENT APPROACHES TO NURSE STAFFING

Shortcomings in current nurse staffing models present opportunities for improvement that will benefit patients, nurses, and healthcare organizations. No single staffing model is ideal in all settings of care or situations but must be adjusted according to specific unit or department patient care needs. Fixed or rigid models do not provide the flexibility needed to adapt to changes in the care environment from hour to hour, or over the long term. Models that consider additional variables that more closely match patient need with professional skill mix, experience, and the conditions under which nurses provide care, offer the precision necessary for today's complex healthcare environment and patient needs.

The IOM, among others, has recognized the importance of appropriate nurse staffing:

> *Monitoring patient health status, performing therapeutic treatments, and integrating patient care to avoid healthcare gaps are nursing functions that directly affect patient safety. Accomplishing these activities requires an adequate number of nursing staff with the clinical knowledge and skills needed to carry out these interventions and the ability to effectively communicate findings and coordinate care with the interventions of other members of the patient's care team. Nurse staffing levels, the knowledge and skill level of nursing staff, and the extent to which workers collaborate in sharing their knowledge and skills all affect patient outcomes and safety.*[79]

Over the years a number of nurse staffing strategies and models have been tested and utilized across and within healthcare organizations. Inherent weaknesses in some models present opportunities for improvement that benefit patients, nurses, and healthcare organizations. The underlying discussion essentially involves the contrast between fixed or rigid models and those which include components that allow for the greatest degree of flexibility to ensure staffing needs are met in real time.

Fixed staffing models: Rigid methods of staffing such as the use of fixed mandated staffing ratios and staffing grids often rely on a set number of nurses for a particular unit or shift or an unalterable nurse-to-patient staffing ratio. The rigid staffing models fail to consider the hour-to-hour changes that are the norm in a patient care environment. We call this out because this practice is still in use and has multiple shortcomings. The grid approach usually relies on a fixed number of nurses for a particular unit or shift (e.g., 2 nurses per evening shift on unit x) or a fixed nurse-to-patient staffing ratio (e.g., 1 nurse for every X patients). The concern is that other variables that impact the need for nursing staff such as severity

of patient condition, complexity of care, nursing skill level, skill mix of staff, and actual or projected change in census are given little or no consideration in this type of staffing plan. Examples of fluctuations caused by "uncertain" but common occurrences are workflow surge created by high numbers of discharges and admissions, or high numbers of post-operative or procedural patients; variations in emergency room patient mix between late nights and weekends and daytimes; or unexpected surges due to large-scale accidents or natural disasters.

Flexible staffing models: By contrast, in a flexible staffing model, the number of nurses and/or the nurse-to-patient ratio is adjusted upward or downward to account for unit and shift level factors including patient condition, complexity or acuity of care, nursing skill level required, and the fluctuation in patient census. This type of model delivers the most precise staffing recommendation, but will fall short if developed in a vacuum. To be successful, staffing care delivery models and staffing plans must be created with the input of clinical direct care nurses to ensure that all aspects of the unit environment, patient care needs, and attributes of nursing staff are considered when developing the staffing plan. Strengths and limitations of both approaches are summarized in **Table 6.**

Table 6. Strengths and Limitations of Fixed and Flexible Staffing Models

Staffing Approach	Description	Strengths	Limitations
Fixed staffing models	Relies on a fixed number of nurses for a particular unit or shift or a pre-selected nurse-to-patient staffing ratio based on past trended averages	Relatively simple to calculate; many institutions have created or use built-in staffing grids	May not consider the severity of patient condition, complexity or acuity of care, nursing skill level required, or fluctuations in patient census
Flexible staffing models	The number of nurses and/or the nurse-to-patient ratio are adjusted upward or downward to account for unit and shift level factors	Considers the severity of patient condition, complexity or acuity of care, nursing skill level required, and the fluctuation in patient census	More difficult to calculate; may not be feasible to calculate using existing staffing grids or the institution's existing staffing software Requires evaluation of all factors (acuity, nurse skill level, census) periodically throughout the day to be successful Requires continuous evaluation, which may be challenging to sustain

Across the country, nursing leaders are successfully developing and piloting innovative staffing models resulting in high-quality, cost-effective patient care. In general, a key feature of these models is that they promote empowerment by creating a work environment that supports nurses in practicing to their full professional scope. In **Appendix C** we provide six case studies from a number of different hospitals that demonstrate different organization or unit-specific approaches to solving a staffing-related issue. An important component of each is the measurement and reporting of clinical, nursing, and/or financial outcomes that provide the means to assess the effectiveness of the change.

Additionally, ANA has identified a set of core components of an optimal nurse staffing model that further promotes safe and quality patient care (see **Table 7**).

Table 7. ANA Core Components of Nurse Staffing

Components	
1.	All settings should have well-developed staffing guidelines with measurable nurse-sensitive outcomes specific to that setting and healthcare consumer population, which are used as evidence to guide daily staffing.
2.	RNs are full partners working with other healthcare professionals in collaborative, interdisciplinary partnerships.
3.	RNs, including direct care nurses, must have a substantive and active role in staffing decisions to ensure the necessary time with patients to meet care needs and overall nursing responsibilities.
4.	Staffing needs must be determined based on an analysis of healthcare consumer status (e.g., degree of stability, intensity, and acuity), and the environment in which the care is provided. Other considerations to be included are: professional characteristics, skill set, and mix of the staff and previous staffing patterns that have been shown to improve outcomes.
5.	Appropriate nurse staffing should be based on allocating the appropriate number of competent practitioners to a care situation; pursuing quality of care indices; meeting consumer-centered and organizational outcomes; meeting federal and state laws and regulations; and attending to a safe, quality work environment.
6.	Cost-effectiveness is an important consideration in delivery of safe, quality care.
7.	Reimbursement structure should not influence nurse staffing patterns or the level of care provided.[80]

Legislative/Regulatory Guidance on Nurse Staffing

The absence of strong federal nurse staffing requirements has resulted in states taking the lead in advancing legislative solutions. In addition, ANA has introduced a legislative model in which nurses are empowered to create staffing plans that are flexible and account for variables within unique patient care environments.

While the locus of nurse staffing is institution- and unit-specific, those efforts can be aided by law and regulation that support the core components set forth in **Table 7**. Currently there is no federal nurse staffing law, although there is a long-standing Federal Regulation (42CFR 482.23(b)) requiring Medicare-eligible hospitals to "have adequate numbers of licensed registered nurses (RNs), licensed practical (vocational) nurses, and other personnel to provide nursing care to all patients as needed." The current language does not provide clear direction and places the burden of interpretation on healthcare organizations. Staffing bills have been introduced in multiple sessions of Congress without success.

ANA has introduced a legislative model in which nurses are empowered to create staffing plans that are flexible and account for variables within unique patient care environments. This model promotes the establishment of minimum upwardly adjustable staffing levels and includes consideration of the intensity, complexity, and stability of patients; unit activity, including the number of admissions, discharges, and transfers during a shift; level of experience of nursing staff; layout of the unit; and availability of resources (e.g., ancillary staff, technology). Optimal staffing is much more than just numbers, and direct care nurses are well equipped to contribute to the development of staffing plans. Public reporting and other mechanisms that can support the general principles of flexible staffing models are endorsed, as well as restrictions on the use of mandatory overtime.

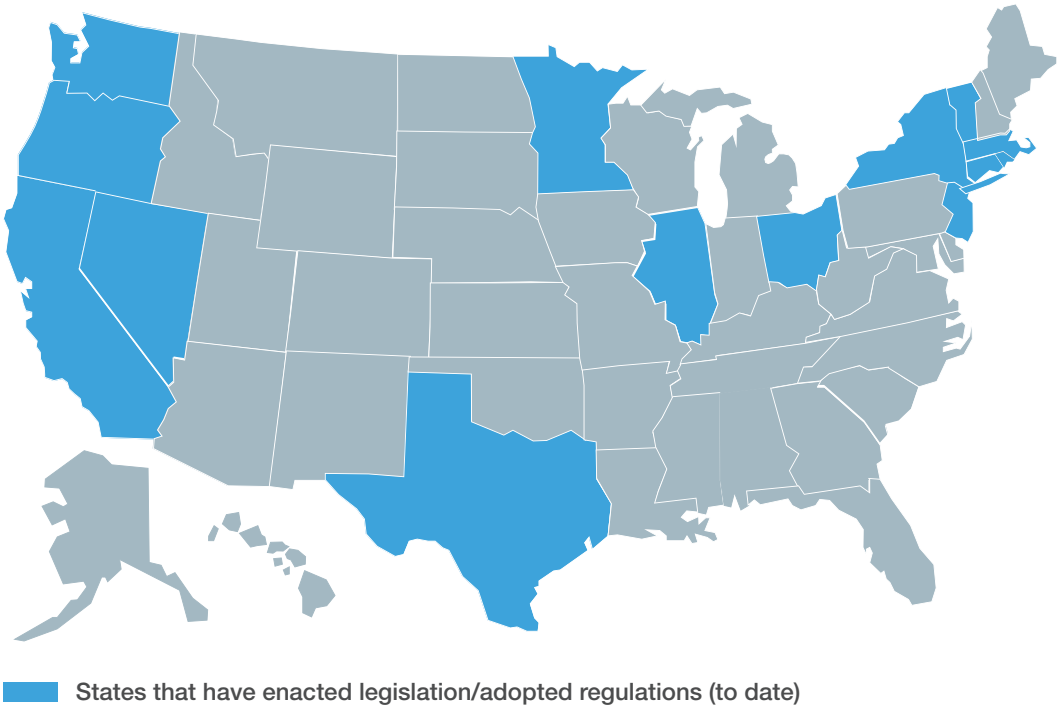
State-Level Activities

The absence of strong federal requirements has resulted in states taking the lead in advancing legislative solutions. Existing state staffing laws have taken one or more of three general approaches:

1. Requiring hospitals to have **nurse-driven staffing committees** composed of a majority of clinical direct care nursing staff to ensure that staffing plans reflect the needs of the patient population and match the skills and experience of staff;
2. Mandating **specific nurse-to-patient ratios by unit/specialty**; and/or
3. Requiring facilities to **disclose staffing plans** to the public and/or a regulatory body.

As of press time, 14 states have laws or regulations to address nurse staffing: California, Connecticut, Illinois, Massachusetts, Minnesota, Nevada, New Jersey, New York, Ohio, Oregon, Rhode Island, Texas, Vermont, and Washington (see **Figure 1**).[81]

Figure 1. States that have enacted legislation and/or adopted regulations addressing nurse staffing, as of August 2015 (Source: ANA)



States that have enacted legislation/adopted regulations (to date)

Specific state actions include:

- **Nurse-driven staffing committees:** Seven states require hospitals to have staffing committees responsible for creating unit-specific staffing plans and related policy and procedures (CT, IL, NV, OH, OR, TX, WA). Additionally, Minnesota requires a Chief Nursing Officer or designee to develop a core staffing plan with input from others; requirements are similar to Joint Commission standards.
- **Nurse-to-patient ratios by unit/specialty:** California is the only state that requires a minimum nurse-to-patient ratio by type of unit be maintained at all times. Massachusetts passed a law specific to intensive care units (ICU) requiring a 1:1 or 1:2 nurse-to-patient ratio depending on stability of the patient.
- **Disclosure of staffing plans:** Five states require some form of disclosure and/or reporting of staffing plans and/or data (IL, NJ, NY, RI, VT).

The California Experience

As the only state to mandate a prescribed nurse-to-patient ratio that must be maintained at all times, much of the nurse staffing research has focused on the experience in California.

Several studies have evaluated the impact of the California mandate on nurse satisfaction. One study reported an increase in overall nurse satisfaction, with nurses having a more balanced life, financial security, and stable home life.[82] However, segmentation of these results showed that nurses involved in direct patient care reported greater dissatisfaction compared with nurses working in non-patient facing roles. The authors suggested that nurses involved in direct patient care had higher dissatisfaction because the mandated staffing ratios, coupled with "rigid" implementation by management, did not allow nurses to respond to situation-specific patient care needs. Nurses also reported that the system created uniformity that did not promote professional growth or foster innovation in patient care.

In another analysis based on the California experience, Chapman et al. reviewed the impact of fixed nurse staffing ratios and found that they resulted in improved satisfaction with workload, but decision-making control was taken out of nursing's purview and ultimately decreased other aspects of job satisfaction.[83] Another post-implementation analysis indicated that hospital nurses in California have lower patient workloads than nurses in states without minimum nurse-to-patient ratios, increased satisfaction with their work environment, and that the California nurse staffing ratios are associated with lower patient mortality and better nurse retention.[84]

One study assessed the impact of the California mandate on patient safety. Spetz et al. divided California's hospitals into four quartiles based on their pre-regulation licensed nurse staffing levels (RNs and LPNs) in medical–surgical units. Post-implementation changes in patient safety measures were mixed: greater declines in patient mortality following complications were observed in hospitals with the largest changes in staffing, but there was "little evidence of significantly different changes in other [patient safety indicators] across pre-regulation staffing levels."[85]

At least one observer has cautioned that in interpreting the results from California's experience, it is important to separate the policy intent of the law (i.e., minimum ratio with encouragement of upward adjustment) from the unintended consequences that have resulted in interpretation of the ratios as a fixed maximum from which providers cannot deviate.[86]

Restrictions on Mandatory Overtime

As of press time, 14 states are known to have restrictions on the use of mandatory overtime for nurses in statute: AK, CT, IL, MD, MA, MN, NH, NY, OR, PA, RI, TX, WA, and WV; while 2 states (CA and MO) have provisions in regulations.[87]

The number of hours per nursing shift plays an important role in patient safety, job performance, and satisfaction. Nurses working 12 or more hours per shift report higher burnout and job dissatisfaction, and as hours increase to 13 or more, patient dissatisfaction increases as well.[88] Nurse fatigue can negatively affect hospital operational costs and patient and employee satisfaction.[89] ANA proposes that employers and RNs must collaborate and adopt evidence-based policies, procedures, and strategies that can reduce the risk of fatigue and sleepiness associated with shift work and long working hours in order to optimize patient care and a safer work environment for both patients and RNs.[90] One of the ways to achieve this target is by limiting the number of hours an RN can work per week. ANA has taken a position prohibiting the use of mandatory overtime for nurse staffing and made it part of legislative and regulatory reform efforts.

IV. OPPORTUNITIES TO ACT IN AN ERA OF HEALTH REFORM

As the demand for care grows, there will be increased pressure to demonstrate the value of nursing and its direct impact on both clinical and economic outcomes. Quality improvement programs implemented through the ACA provide new opportunities to demonstrate the value of nursing care.

Appropriate nurse staffing is essential to optimizing patient outcomes and delivering high-quality care. However, unlike physicians and other allied health professionals such as physical or speech therapists, the majority of nurses do not bill for their services, and do not have a mechanism to directly generate revenue. As such, the evaluation of efficiency or cost-effectiveness related to nursing care does not fit neatly into the simple equation used to value physicians or allied health professionals, which is revenue generated divided by the cost to deliver care. In the absence of a direct revenue generating component, those measuring nursing efficiency or cost-effectiveness have to rely on surrogate or indirect measures such as overall revenue generation, cost avoidance, readmission rates, and length of stay, which may or may not accurately reflect the cause and effect of nursing's contribution.

Many hospital administrators consider nursing services as cost centers and physician services as revenue centers, while physician services are actually both cost and revenue centers. Only recently are physicians being evaluated using more sophisticated algorithms that involve *revenue* and costs in relation to clinical and patient-reported outcomes. Both types of outcomes are more difficult and time-consuming to measure than revenue, and an outcomes-based approach to value demonstration requires far more effort on the part of researchers to prove cause and effect than does the relation of revenue and costs.

The Value of Nursing Care and Quality Improvement Programs

Many sections of the ACA and other legislative and regulatory actions preceding it have created mechanisms to promote improved quality of care through reimbursement incentives and financial penalties. Nurses are essential to the success of formal quality initiatives, including accountable care organizations (ACOs) and bundled payment initiatives, which bring together facilities and clinicians to improve quality and reduce cost. In hospitals, nurses are key members of the provider team that delivers high-quality care resulting in reimbursement for care, if not a bonus payment. For instance, the Hospital Value-Based

Purchasing (VBP) program adjusts a portion of a hospital's Medicare payment based on its performance against other hospitals, and improvement on numerous quality measures.[91]

Similarly, through the Hospital Readmissions Reduction Program (HRRP), Centers for Medicare & Medicaid Services (CMS) has the authority to reduce payments to acute care hospitals with excess Medicare readmissions (within 30 days of discharge) for select conditions, based on factors such as complications and inadequate treatment during the admission or inadequate care coordination after discharge.[91] Although outcomes are specifically tied to physician providers, nurses—as critical members of the team—are essential to achieving outcomes that result in incentive awards and avoidance of penalties. In addition to the importance of heightened surveillance by nurses that is a critical element in reducing HACs, nurses contribute to the reduction of avoidable readmission rates through their skill in managing and educating patients as they approach discharge from the hospital. Nurses play a key role in the ACA's $500 million investment to develop transitional care models, which are designed to help Medicare beneficiaries who have chronic conditions and are susceptible to readmissions to make the transition successfully from a healthcare facility to home.[92] The program relies on the knowledge, skills, and abilities of nurses to provide the care needed to achieve the goals of these programs.

A summary of selected ongoing quality initiatives and the role of professional nurses is presented in **Table 8** below.

Table 8. Role of Professional Nurses in Formal Quality Initiatives

Type of Quality Initiative	Description	Role of Professional Nurses
Accountable Care Organizations (ACOs)	Groupings of physicians and hospitals organized in a legal structure with the goal to better coordinate care of a group of patients to improve outcomes and patient satisfaction and reduce costs.[93] Possibility of bonus payments based on the ACO's ability to deliver against goals.	Nurses work with providers to meet financial goals by continuing to deliver high-quality care and improvements in patient satisfaction.
Bundled Payments for Care Improvement (BPCI)	Initiative payments to healthcare providers are bundled across an episode of care, with the goal of removing fragmented care and promoting collaborative care to improve outcomes and reduce costs.[94]	Nurses coordinate care and educate patients to promote high-quality and cost-effective outcomes.

Type of Quality Initiative	Description	Role of Professional Nurses
Hospital Readmission Reduction Program (HRRP)	Reductions in payments to acute care hospitals with excess Medicare readmissions (within 30 days of discharge) for MI, heart failure, and pneumonia, based on factors such as complications and inadequate treatment during the admission or inadequate care coordination after discharge.	Nurses manage and educate patients as they approach discharge from the hospital in efforts to help hospitals avoid unnecessary readmissions.
Value-Based Purchasing (VBP) program	Program adjusts a portion of a hospital's Medicare payment based on its performance against other hospitals, and improvement on numerous quality measures.	Because of their roles and responsibilities in medication administration, patient education, and monitoring and coordination of care, nurses are key stakeholders in the success of VBP initiatives.
Health Care Payment Learning and Action Network ("Network") and other innovation initiatives[95]	More than 4,000 payers, providers, employers, patients, states, consumer groups, consumers, and other partners have registered to participate in the Network, the goal of which is to leverage knowledge coming from governmental and others parties' demonstrations of innovation in healthcare delivery.	Nurse practitioner-managed models of care such as RAVEN (part of the Initiative to Reduce Avoidable Hospitalizations among Nursing Facility Residents) have been selected by CMS as patient-centered innovative care delivery models designed to provide effective, quality care for older adults.[96]
Other public/private initiatives	In the public sector, the Center for Medicare and Medicaid Innovation (CMMI) has been set up by CMS as a proving ground for more cost-effective models of care. In the private sector, payers have undertaken myriad initiatives with similar aims.	There are many examples of nurse-led and managed initiatives across the continuum of care focusing on health promotion and chronic disease management. All have demonstrated exemplary clinical quality outcomes.[97,98,99]

Strategies to Demonstrate the Value of Nursing

The implementation of the ACA offers opportunities to demonstrate the value of nursing staff. Welton[100] offers several conceptual strategies for moving forward:

- Develop a "shadow" billing system for professional nurses: Define and price the nursing "product" separate from room and board, and develop alternative accounting and billing models that allocate nursing as a variable cost and intensity to each patient, each day of stay for inpatient settings, or comparable metrics to identify nurses' contribution to care in other settings within the accounting system.
- Directly link nurses to patients within operational and clinical databases, such as automated staffing systems to help identify the optimum mix of skill, experience, and academic preparation of nurses that provides the best value of nursing care.
- Educate nursing students, staff nurses, nurse managers, and executives on basic business and economic concepts and integrate these concepts throughout all nursing school curricula.
- Work within the research parameters of the ACA to include nursing costs and intensity within innovative payment and delivery models that will be funded by CMMI and value-based care initiatives.
- Integrate nurses into the ACO payment structure and explain the nursing roles, resources, and best practices within ACOs that achieve the best outcomes.
- Provide greater financial autonomy for nurses, such as developing separate nursing revenue centers within organizations, aligning nursing cost and billing practices with payment mechanisms, and allowing nurses greater control over nursing revenue to achieve the best value of care.

V. DEVELOPING AND IMPLEMENTING AN EVIDENCE-BASED STAFFING FRAMEWORK

A set of principles, such as those developed by ANA, are foundational to the development, implementation, and adaptation of optimal nurse staffing models. However, they are just the beginning. More private, public, and collaborative work needs to be done to establish the evidence base on which to operationalize such models throughout healthcare organizations. Public sector efforts, including federal and state legislation and public reporting of staffing data, are important to implementing optimal nurse staffing models to achieve safer and higher quality patient care.

Building off the Base

As discussed earlier, nurse involvement is essential in the development of flexible nurse staffing and implementation of the core principles (**Table 7**). Efforts to develop flexible nurse staffing models need to be based on these principles, additional excerpts from which can be found in **Appendix B**. While of the utmost importance, they are just a beginning.

As one prominent author stated:

> *Nurse staffing is complex. Nurse leaders have taken many initiatives to incorporate evidence and scientific data into nurse staffing. Each unit is unique particular to patient populations, acuities of the patients, skill mix of nurses, education and competency of the nurses, among other variables to consider in making assignments. Understanding these variables, the clinical managers, staffed mostly 24 hours per day, 7 days per week, have the power and autonomy to make appropriate nurse staffing assignments. Nursing leaders must understand data-driven nurse staffing plans to communicate clearly and budget appropriately for nursing resources. More research and sharing of evidence-based or best practices in nurse staffing needs to be completed and shared with the nursing community.*[101]

Important Considerations

- Successful nurse staffing considers the *who, what, why, when,* and especially *how* care is delivered to each patient. Due to this complexity, additional private, public, and collaborative work needs to be done to establish the empirical base on which innovative and flexible staffing models can be built.
- While the National Quality Forum (NQF) has endorsed two staffing-specific measures, ANA and others continue to advocate for public reporting of staffing plans by healthcare organizations. Transparency in reporting will provide much-needed data to inform researchers and clinicians about best staffing practices, and provide important information to assist the public in decision-making and selection of quality healthcare services.
- More sophisticated methodologies are needed to prove the causal relationships between staffing and patient outcomes, and to determine the true cost-effectiveness of adjustable staffing models across all settings of care. To study cost-effectiveness, information on the economic impact of nurse staffing needs to be coupled with its clinical impact in ways that have not been done before.
- Assessing the economics of additional nursing hours can be challenging for a variety of methodologic reasons, but it must be conducted with a greater level of rigor than has generally been used before so that results can be used to support the aim of optimal nurse staffing models in real-life practice settings.

Furthering Federal and State Legislation

Federal and state legislation has been introduced to advocate for safe staffing and support the connection between staffing and patient outcomes. Public reporting will facilitate the capture and analysis of data needed to strengthen the empirical base to better understand factors that contribute to optimal staffing plans that result in quality patient outcomes.

Federal legislation has been reintroduced during the 114th Congress in both the Senate and House, drawing attention to the importance of nurse staffing and its impact on both nurses and patients.[102] The Registered Nurse Safe Staffing Act (Act) is written to amend the Social Security Act to require each Medicare participating hospital to implement a hospital-wide staffing plan for nursing services furnished in the hospital.[103]

The Act promotes safe nurse staffing by requiring each Medicare participating hospital to establish a committee comprising at least 55% direct care nurses and to create nurse staffing plans that are specific to each unit. This committee approach to creating nurse staffing plans recognizes that direct care nurses, working closely with their managers, are well equipped to determine the staffing level for their patients. During regular meetings,

the committee would determine the appropriate number of nurses to provide care based on patient needs, with attention to unit characteristics such as nurse education, skill mix, specialty nursing association staffing recommendations, and quality data. Finally, each hospital would be required to collect staffing data and document the information on a quarterly basis for the purpose of public reporting. Failure to meet this requirement would result in civil or monetary penalties.

VI. CONCLUSIONS

Changes in the U.S. healthcare market, particularly the increased focus on value-based care, is driving the need to adopt staffing practices that ensure high-quality nursing care that will result in optimal patient outcomes. In this analysis, Avalere found extensive empirical research linking suboptimal nurse staffing to negative patient outcomes. In addition, Avalere demonstrated that the use of RNs, with skills matched to patient need, and deployed in an environment and conditions conducive to good care, results in the provision of high-quality care and positive outcomes.

Improved outcomes are associated with staffing models in which the number of nurses and/or the nurse-to-patient ratio can be adjusted upward or downward in real time to account for unit and shift-level factors. Implementation of a legislative model will help set basic standards and encourage transparency of action through public reporting and imposition of penalties on institutions that fail to comply with minimal standards. With the increased focus on value-based care, embracing the concept of optimal staffing is critical to the delivery of safe, high-quality, and cost-effective care.

This assessment also identified emerging evidence of economic benefits associated with optimal nurse staffing models. Our aim in the next paper in this series is to build on and further synthesize the research to make the economic case for optimal nurse staffing models. In essence, we believe that staffing models that optimize quality and clinical outcomes will be essential to achieving the economic outcomes needed to succeed in value-based healthcare.

APPENDIX A: GLOSSARY

Term	Description
Fixed staffing models	An approach to staffing that relies on a fixed number of nurses for a particular unit or shift (e.g., 2 nurses per evening shift on unit x) or a fixed nurse-to-patient staffing ratio (e.g., 1 nurse for every X patients).
Flexible (variable) staffing models	An approach to nurse staffing in which the number of nurses and/or the nurse-to-patient ratio can be adjusted (upward or downward) to account for unit and shift level factors including patient condition, complexity or acuity of care, nursing skill level required, or the fluctuation in patient census.
Hours per patient day	A staffing metric that calculates the total number of productive hours worked by nursing staff with direct patient care responsibilities on acute care units per patient day. There is no standard definition. Variations of this metric may exclude administrative hours, contract hours, etc. Metric can also be calculated as hours per patient week and other units of time.
Nurse-to-patient ratio	A staffing metric that indicates the minimum number of nurses required per a specific number of patients. Also expressed as the minimum number of patients staffed by every 1 nurse. ICUs, for example, may require a 1:1 or 1:2 nurse-to-patient ratio depending on stability of the patient.
Optimal nurse staffing model and safe staffing	A nurse staffing model is considered optimal when the impact of nursing care results in better than average staffing sensitive outcomes for one or more target indicators. Optimal nurse staffing models incorporate evidence-based principles such as consideration of intensity of care, nurse education and experience, and other factors to develop and maintain a flexible staffing plan that positively impacts staffing-sensitive outcomes.
Safe staffing model	Nurse staffing is considered safe when the availability of appropriate nursing care on a shift-to-shift basis results in patient care needs being met in a hazard-free work environment.
Staffing-sensitive indicators	Staffing-sensitive indicators include, but are not limited to, inpatient mortality, patient length of stay, hospital readmissions, and reduction of adverse outcomes such as HAIs.
Skill mix	The combination or grouping of different categories of workers employed in any field of work related to patient care; in this case, nursing care.
Staffing committee	A multidisciplinary team of nurse leaders and hospital administrators who meet on an ongoing basis to determine appropriate staffing levels for their institution/healthcare system based on needs of the patient population and skills/experience of nursing staff.

Staffing grid	A tool utilized by nurse leaders in which they input the absolute number of nurses, nursing hours, and/or nursing ratio required to provide the minimum level of nursing coverage for a particular ward/unit or shift. The grid approach usually relies on a fixed number of nurses for a particular unit or shift or a fixed nurse-to-patient staffing ratio. Other variables that affect staffing are not considered in fixed staffing formulae. A grid can be as simple as an Excel spreadsheet in which the nurse leader manually adjusts the counts and ratios for each unit/shift or it may be part of a hospital/healthcare system-based staffing management software system in which more formal data reporting is captured.

APPENDIX B: ANA CONSIDERATIONS IN BUILDING AN EVIDENCE-BASED STAFFING FRAMEWORK

Excerpted with permission from American Nurses Association. Principles for Nurse Staffing. 2nd Edition. (2012)

Role	Considerations in Building an Evidence-Based Staffing Framework
Patient Need	The needs of the individual healthcare consumer, families, and the population serviced at each institution must be considered in staffing decisions, including: • Severity, intensity, acuity, complexity, and stability of condition; existence and severity of multi-morbid conditions and complexity of care needs; scheduled procedure(s) • Age and functionality, communication skills, cultural and linguistic diversities; ability to meet healthcare requisites • Availability of social supports; transitional care, within or beyond the health-care setting; continuity of care • Environmental turbulence (i.e., rapid admissions, turnovers, discharges) • Other specific needs identified by consumer, family, and RN
Nurse Experience	External factors or organizational dynamics do not stand alone in the decision-making; patient needs should determine the appropriate clinical competencies, credentials, and qualifications of RN staff. The following nurse characteristics should be taken into account: • Educational preparation, professional certification, licensure • Level of clinical experience (i.e., novice to expert) • Experience with the population served • Competency with technology and clinical interventions • Language capabilities and cultural competency • Organizational experience

Role	Considerations in Building an Evidence-Based Staffing Framework
Practice Environment	Workplace culture and environment play an important role in the success of staffing programs. Provider organizations should create a work environment that values nurses and sees them as an asset to their mission. In addition to appropriate staffing, organizations should include at a minimum: • Necessary and sufficient time for patient documentation; time to collaborate with and supervise other staff; time to accommodate increased documentation demands created by integration of technology, electronic records, surveillance systems, and regulatory requirements; time for coordination and supervision of nursing assistive personnel by RNs • Timely coordination, supervision, and delegation as needed to maximize safety. Access to timely, accurate, relevant information provided by communication technology that links clinical, administrative, and outcome data • Effective and efficient support services (e.g., transport, clerical, housekeeping, and lab) • Support in ethical decision-making • Resources and pathways for care coordination and healthcare consumer/client and/or family education • Processes to facilitate transitions during work redesign, mergers, and other major changes in work life • Continuing education and training
Staffing Guidelines	No single method, model, or assessment tool (e.g., nursing hours per patient day, nursing intensity weights, ratios) is optimal in all settings or situations. In recognition of the nuances and specifics encountered at each institution the ANA recommends setting specific staffing guidelines that consider the following elements: • Governance within the setting (i.e., shared governance) • Involvement in quality measurement activities • Quality of work environment of nurses • Development of comprehensive plans of care • Practice environment • Architectural geography of unit or institution • Evaluation of practice outcomes that include both quality and safety • Available technology • Evolving evidence

Role	Considerations in Building an Evidence-Based Staffing Framework
Staffing Models Require Continuous Evaluation	Staffing plans always need to be evaluated and adjusted as necessary based on a review of multiple factors: Patient outcomes, especially as measured by nurse-sensitive indicators • Time needed for direct and indirect patient care • Rate of work-related staff illness, injury, and turnover/vacancy • Overtime rates; flexibility of human resource policies and benefit packages • Rate of use of supplemental staffing • Evidence of compliance with applicable federal, state, and local regulations • Levels of healthcare consumer satisfaction and nurse satisfaction

APPENDIX C: BEST PRACTICES FROM THE FIELD

Many hospital systems, both large and small, have successfully developed and implemented their own staffing methodology. Best practices from leading institutions are highlighted here.

- **Case Study 1: A Multi-Pronged Approach to Improvements in Nurse Staffing in a Community Hospital**
- **Case Study 2: Implementation of Patient Classification/Acuity System Recommended Staffing in a Large Academic Medical Center**
- **Case Study 3: Implementation of Sound Business Processes Matching Labor Supply to Patient Demand Across an Integrated Healthcare System**
- **Case Study 4: Preserving Staffing Resources as a System: Nurses Leading Operations and Efficiency Initiatives**
- **Case Study 5: Beyond a Band-Aid® Approach: An Internal Agency Solution to Nurse Staffing**
- **Case Study 6: Real-Time Changes in Nurse Staffing to Accommodate Intermediate Care Patients Population**

Case Study 1: A Multi-Pronged Approach to Improvements in Nurse Staffing in a Community Hospital

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Background and Challenges: Prior to implementation of the staffing solutions, nurse staffing performed mostly below the National Database of Nursing Quality Indicators (NDNQI) 50th percentile for RN hours per patient day (RNHPPD), leaving the hospital potentially unable to meet its mission of delivering high-quality, cost-effective care.

Solutions: Core to this change was a shared vision among staff nurses, nursing leadership, and executive staff in a Nurse Staffing Advisory Council (NSAC), composed of 60% frontline nursing staff. The vision was to plan and implement changes needed to staff at the NDNQI 50th percentile without making infeasible or overly costly changes. Actions that were taken to achieve that goal included:

1. Reconciliation of the existing nurse full time equivalent (FTE) count with all applicable departments and standardization of counting processes for the position control system
2. Forecasting of turnover at a predetermined rate (e.g., 12%) for each department and granting flexibility to nurse managers to hire ahead of the turnover curve
3. Planning and acting in advance to manage peak census in winter months through proper use of the “float pool” and “traveler” nurses
4. Elimination of inflexible nurse-to-patient ratios for staffing purposes; use of automated tools generating predictive volume patterns and assignment of nurses that is acuity-based, using a patient classification system mapped from the electronic health record and adjusted daily
5. Establishment of a minimum staffing plan and monitoring system not allowing any nursing department to be staffed below the NDNQI 25th percentile
6. Adoption of fatigue management guidelines whereby nurses do not work more than 12.5 hours per day, no more than three 12-hour shifts in a row, or more than 60 hours in any 7-day period—coupled with the goal to maintain overtime to less than 4% of paid dollars

Nurse Staffing Outcome: Following full implementation of the staffing solutions in October 2013, mean RNHPPD at Midland Memorial Hospital rose for the next three quarters to performing just above the NDNQI all hospitals mean. Benefits for patients and staff were realized without unsupportable cost increases.

Case Study 2: Implementation of Patient Classification/Acuity System Recommended Staffing in a Large Academic Medical Center

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Background: Many healthcare organizations experienced an abrupt change in staffing allocations in late 2012 and 2013 as organizations tried to predict the impact of the Affordable Care Act on hospital census and reimbursement. This change essentially was a slowdown in hiring as organizations attempted to right-size the workforce for the predicted drop in census. However, not all hospitals experienced the consistent census drop that was predicted, and many nurse leaders believed that a lack of available nursing staff would result in erosion in patient-related quality metrics.

Challenges: The nurse leaders at an academic medical center in Phoenix, AZ, were experiencing these phenomena of eroding quality scores and began an appreciative inquiry into the root causes of this decline. The results of a review for the year 2012 through the first quarter of 2014 showed a persistent deficit in actual staffing against the Patient Classification/Acuity System (PCS) recommended staffing. During the same period of time metrics relating quality, safety, and service were reviewed. The results of these reviews showed that as the variance in recommended/actual staffing increased there were identified increases in measures of patient complaints, employee injuries, and turnover. This relationship between variables supports the evidence that staff models must transcend the traditional hours per patient day (HPPD) calculation and include variability in staffing that is specifically tied to patient individually identified nursing care needs and associated nursing workload.

Solutions: Nursing leadership, after considering several temporary solutions to bridge the gap, decided to approach the problem with a proactive staffing recommendation to organizational leadership. Through this collaborative, data-centric approach to assessing workforce capacity, an immediate approval of 20 nursing FTEs was granted and a clear strategy for ongoing nursing workforce strategic planning was developed. The FTE recruitment was activated in May 2014.

Nurse Staffing Outcomes: The results of this initial effort and the ongoing focus on nurse staffing has resulted in a 2% improvement in recommended versus actual staffing, a 1% decrease in nursing turnover from 2013–2014, and an 18% decrease in the cost of turnover for the organization.

An ongoing review of the PCS recommended staffing versus actual staffing for an academic medical center provides an ability to determine variances in staffing to meet identified patient needs and nursing workload. Assessing measures of quality, safety, and service during the same time period informs nurse leaders as to the impact of inadequate or ineffective staffing on areas of quality, safety, and service.

Case Study 3: Implementation of Sound Business Processes Matching Labor Supply to Patient Demand Across an Integrated Healthcare System

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Background: Enterprise labor management has been receiving much attention in the wake of healthcare reform, the rise of ACOs, and the growing trend of consolidation among health systems and medical groups. The benefits of managing a healthcare organization's largest operating expense at the system level have been well documented and include improved coordination of resources, increases in quality, and reduced labor costs. Penn State Milton S. Hershey Medical Center (PSHMC), with the help of its labor management partner, has taken this concept to a new level, implementing the strategy across the entire continuum of care. PSHMC and its associated medical group began an aggressive endeavor to completely transform their approach to managing their workforce by redesigning processes, adopting new strategies, and implementing technologies to strategically allocate resources across the system to meet patient demand.

Challenges: Staffing challenges included: disparate policies and practices within the hospital and medical group practice sites, a lack of cogent methods and tools to operationalize productivity across the enterprise, the inability to share resources across the medical group practice sites, and paper-based and inconsistent scheduling and labor management tools.

Solutions: Implementation included a state-of-the-art technology scheduling software program and sound business processes matching labor supply to patient demand across the enterprise. The key benefits of the software include: workforce analytics, productivity analysis, and 360-degree policy review with all inpatient nursing units and medical group practice sites; scheduling and productivity software implemented across the complete inpatient nursing division and medical group practice sites; implementation and refinement of a centralized staffing office; and automation and enterprise staff philosophy training.

Nurse Staffing Outcomes: Standardized and automated policies and practices across inpatient nursing and medical group practice sites; implementation of a variable staffing model in medical group practice sites; development of appropriate workload indicators, benchmarks, and productivity standards across all departments; institution of automated business rules within scheduling software to ensure sustainable results; empowerment of nurses with timely, actionable metrics and dashboards; and implementation of self-scheduling, pre-posting, and open shift management tools within inpatient nursing. Direct cost savings following program implementation are summarized below.

Institution	Recognized cost savings to institution following staffing changes
Milton S. Hershey Medical Center	$2.1M two-year savings
Medical Group (Affiliated)	$517K savings in year two

Case Study 4: Preserving Staffing Resources as a System: Nurses Leading Operations and Efficiency Initiatives

Authors: *Karen S. Hill, DNP, RN, NEA-BC, FACHE, FAAN; Karen Higdon, DNP, RN, NEA-BC; Bernard W. Porter, BBS; Michael D. Rutland, MBA, FABC, FACHE, FHFMA; Donna K. Vela, MSN, RN, NE-BC, CPM*

Citation: *Nurs Econ. 2015;33(1):26-35.*

Background: Baptist Health (BH) is a nonprofit, seven-hospital system located in Kentucky. Two of the hospitals, Baptist Health Lexington and Baptist Health Louisville, are Magnet® designated and the remaining five are on the journey of Pathway to Excellence®. In the Spring of 2013, the system identified opportunities to enhance communication across facilities and encouraged executives and department leaders to work together to achieve common goals of efficiency and quality.

Challenges: The annual variance on medical/surgical (MS) units was averaging an unfavorable $2.3 million level in September 2013, before process improvement was initiated.

Solutions: Used a process led by nursing but involving other hospital managers:

1. Initiated an operations and efficiency council (OEC), including nurse leadership as well as other managers, to identify expense reduction and revenue enhancement opportunities. The first services identified for the standardization/benchmarking process were medical/surgical and surgical.
2. Adopted the Premier® 95th percentile comparison, later adjusted to 92% and mapped appropriately for each MS nursing unit (i.e., general, telemetry, or intensive care).
3. Assessed and compared current practices, processes, and roles for each facility, identified top performers, staffing practices, and worked hours per unit of service.
4. Developed staffing plans based on identified top benchmarked performance for the comparison department.
5. Defined appropriate roles as input to the staffing plan.
6. Identified the data needed for comprehensive assessment of project goals and desired outcomes.
7. Developed a financial efficiency plan through brainstorming and sharing of best practices.
8. Identified data and reports needed to assess staffing efficiency and granted access to nurse and financial leaders.
9. Developed an MS staffing plan at each census level. This process was validated at the end to ensure nurse leaders from each facility were in agreement and could support and operationalize the staffing grid in their hospitals.

Nurse Staffing Outcomes: After implementing the recommendations, variance decreased to $1.4 million, which is an annualized savings of nearly $1 million.

Case Study 5: Beyond a Band-Aid® Approach: An Internal Agency Solution to Nurse Staffing

Authors: *Jewel Adams, MSN, RN, FNP, NEA-BC; Roberta Kaplow, PhD, APRN-CCNS, AOCNS, CCRN; Janet Dominy, BSN, RN, ONC; Bridgett Stroud, MSN, RN, OCN*

Citation: *Nurs Econ. 2015;33(1):51-58.*

Background: Emory Healthcare is a university-based healthcare system comprising seven entities (six hospitals and one clinic) all located in the Atlanta area.

Challenges: Prior to implementation of the internal nursing agency, the structure and reporting mechanisms of the float pool among the seven entities were quite different. Other barriers included a lack of standardization of the process of meeting staffing requests in the different entities. In addition, collaboration among nursing leadership posed a significant daily challenge. It was determined that, as a system, staffing resources were not maximized or standardized.

Solutions: The healthcare system leadership recommended evaluating alternatives to current nursing float pool operations in an effort to increase efficiency, maximize utilization of nursing resources, reduce overtime, decrease costs associated with external agency usage, and assist in stabilizing staffing. To help achieve these goals and augment patient outcomes, it seemed logical to have Emory nurses caring for Emory patients. Recognizing the benefit of Emory nurses being familiar with policies and procedures led to the idea of establishing an internal nursing agency, the Emory Staffing Pool (ESP). An internal agency would also give the healthcare system the ability to flex staffing to accommodate acuity and census changes.

Each day, a number of factors are considered when allocating staff to the different entities. First, availability of ESP staff is determined for the next 24-hour period. Unit directors at each entity determine their respective staffing needs. These needs are then reported. The ESP staffing associate matches availability of staff, based on their competencies, with the identified needs of each facility. A conference call is held each day at 11:30 a.m. between the ESP staffing associate and the entity representatives to allocate available ESP staff for the next day.

Nurse Staffing Outcomes:

Reduction in external agency staff usage	The number of hours decreased from 113,085 in quarters 1 to 3 of FY 2013 to 87,022.75 in the same quarters in FY 2014.
Cost savings from external nursing agency use	Through quarter 3 FY 2014, realized cost savings were $1,170,738.47

Case Study 6: Real-time Changes in Nurse Staffing to Accommodate Intermediate Care Patients Population

Authors: *University of Virginia Health System Patient Care Services*

Background: 6 West is a unit with a combination of acute care beds (6W), with a staffing target of one RN to four or five patients, and intermediate care beds (NIMU), with a staffing target of one RN to three patients at the University of Virginia Medical Center. Shift managers (SM) working within that unit play a pivotal role on every shift, managing a dynamic process of continuous evaluation and re-evaluation of staffing adequacy and patient assignment. They use their clinical experience to serve as a resource to everyone on the unit to ensure that delivery is safe and as cost-effective as possible.

Challenges:

(1) At 15 minutes prior to the end of the shift, NIMU was notified of an incoming admission from the emergency department, an elderly patient with a new intracerebral hemorrhage and hypertension. This patient needed the advanced neurological assessment skills of nurses certified in administering the NIH stroke scale. However, 6W had made a commitment earlier in the shift to float an RN to a short-staffed unit elsewhere in the hospital (5C). The shift manager realized that the simple solution of pulling that nurse back to NIMU would be detrimental to the unit to which the nurse floated.

(2) In the first hour of the next shift, the shift manager was then notified of another admission, a patient with stage IV lymphoma with progressive weakness and possible Guillain-Barre Syndrome. This type of patient requires a specific type of complex neurological assessment, and would bring the intermediate population census up to four from three patients.

Solutions: For the first case, the shift manager evaluated the evolving care needs for this patient's complex condition. Given the complexity of the assessment and the need for specialized assessment competency, it was clear that an additional nurse was required to ensure safe care delivery. An RN who had signed up for on-call work opportunities was called in to care for this patient. Thus, the appropriate staffing target for the NIMU (1:3) was maintained, and the other unit was able to continue working with the nurse floated to them earlier in the shift. For the second case, the nurse who was floated to the unit of greater need (5C), was brought back to the NIMU after four hours. This gave the SM on 5C additional time to develop and secure resources for those patients, and allow the nurse with specialized neuro assessment skills to return to the NIMU.

Nurse Staffing Outcomes: The staffing and scheduling adjustments made by shift managers in both of the cases above are typical examples of critical decisions and thoughtful considerations needed to safely and efficiently manage the staffing demands of the mixed population environment.

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