

Nursing and Patient Safety

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Background

Nurses play a critically important role in ensuring patient safety while providing care directly to patients. While physicians make diagnostic and treatment decisions, they may only spend 30 to 45 minutes a day with even a critically ill hospitalized patient, which limits their ability to see changes in a patient's condition over time. Nurses are a constant presence at the bedside and regularly interact with physicians, pharmacists, families, and all other members of the health care team and are crucial to timely coordination and communication of the patient's condition to the team. From a patient safety perspective, a nurse's role includes monitoring patients for clinical deterioration, detecting errors and near misses, understanding care processes and weaknesses inherent in some systems, identifying and communicating changes in patient condition, and performing countless other tasks to ensure patients receive high-quality care.

Nurse staffing and patient safety

Nurse staffing ratios

Nurses' vigilance at the bedside is essential to their ability to ensure patient safety. It is logical, therefore, that assigning increasing numbers of patients eventually compromises a nurse's ability to provide safe care. There are many key factors that influence nurse staffing such as patient acuity, admissions numbers, transfers, discharges, staff skill mix and expertise, physical layout of the nursing unit, and availability of technology and other resources.^{1,2}

Several seminal studies linked in this sentence have demonstrated the association between [nurse staffing ratios](#) and patient safety, documenting an increased risk of [patient safety events](#), morbidity, and even [mortality](#) as the number of patients per nurse increases. The strength of these data has led several states, beginning with California in 2004, to establish legislatively mandated minimum staffing ratios. According to

the [American Nurses Association](#), only 14 states have passed nurse staffing legislation as of March 2021 and most states do not specify registered-nurse (RN)-to-patient ratios, which vary by state and are also setting-dependent.

The nurse-to-patient ratio is only one aspect of the relationship between the [nursing workload and patient safety](#). Overall nursing workload is likely linked to patient outcomes as well. A [PSNet Classic 2011 study](#) showed that increased patient turnover was also associated with increased mortality risk, even when overall nurse staffing was considered adequate. Determining adequate nurse staffing is a very complex process that changes on a shift-by-shift basis. It requires close coordination between management and nursing and is based on patient acuity and turnover, availability of support staff and skill mix, and settings of care. The process of establishing nurse staffing on a unit-by-unit and shift-by-shift basis is discussed in detail in this [WebM&M commentary](#).

Nurse staffing and settings of care

Acute Care Hospitals: The Centers for Medicare & Medicaid Services (CMS) requires hospitals to ensure that there are adequate numbers of licensed RNs, licensed vocational (practical) nurses (LVN), and other staff to provide nursing care to patients as needed (42 Code of Federal Regulations (42CFR 482.23(b)), but does not require specific ratios. Nurse-to-patient ratios are setting-dependent; while five patients per RN may be appropriate in the acute medical-surgical units, intensive care units have a ratio of one or two patients per RN, depending on the acuity of the patient. In California, the nurse patient ratio in the emergency department is one nurse to four patients. In recent years, more states are acknowledging that [better staffing ratios](#) are important to improved patient outcomes. In fact, Dall et al., 2009, found that there were economic benefits to hospitals with better staffing arising from decreased hospital length of stay.³

Skilled Nursing Homes (NH): For nursing homes where there are far fewer RNs, the ratio of nurses to patients or residents is measured in parts of an hour per resident day (hprd), typically appearing as a decimal. For example, in 2020 the national average was 0.75 hprd, which is the equivalent of $\frac{3}{4}$ of an hour, or 45 minutes, of RN time for each resident in the NH. There are many studies of nurse staffing in NHs in relation to quality and safety with varying results. However, the key findings in a recent integrative review include fewer pressure ulcers and urinary tract infections, less likelihood of hospitalizations, decreased mortality, and improved quality measure such as falls and moderate to severe pain.⁴ The review also found improved satisfaction of nurses, which was associated with decreased turnover.

Adequate nurse staffing depends on several factors such as lack of training, administrative demands, distractions, and interruptions that can impact nurse's work.⁵

Nurse staffing and education and training

Nursing skill mix and training appears to be linked to patient outcomes. One classic [study](#) showed lower inpatient mortality rates for a variety of surgical patients in hospitals with more highly educated nurses. This finding has resulted in calls for all nurses to have at least a baccalaureate education, which was one of four key recommendations of the landmark Institute of Medicine report, [The Future of Nursing: Leading Change, Advancing Health](#). Irrespective of educational level, the quality of nurses' on-the-job training may also play

a role in patient outcomes. As discussed in another [WebM&M commentary](#), nurses do not currently have a required standardized transition to independent practice training (analogous to medical residency training); however, in 2002, the University HealthSystem Consortium and American Association of Colleges of Nursing (UHC/AACN) launched the first formal, standardized 12-month long RN residency program with six sites. After the *Future of Nursing Report* (2010) recommended nurse residencies, the program grew to 60 sites with residents. In 2021, all but five states had established nurse residency programs and those last five states were pending the start of the program. With over 93,000 nurses trained in the residency program, the 2018 registered nurse retention rate after one year of residency was 91.5%, compared with the national average of 82.5% of nurses without residency training retained after one year.⁶

Nurses' working conditions and patient safety

The causal relationship between nurse-to-patient ratios and patient outcomes likely is accounted for by both increased workload and stress, and the risk of burnout for nurses. The high-intensity nature of nurses' work means that nurses themselves are at risk of committing errors while providing routine care. [Human factors engineering](#) principles hold that when an individual is attempting a complex task, such as administering medications to a hospitalized patient, the work environment should be as conducive as possible to carrying out that task. However, [operational failures](#) such as interruptions or equipment failures may interfere with nurses' ability to safely and effectively perform such tasks; several [studies](#) have shown that interruptions are virtually a routine part of nurses' jobs. These interruptions have been tied to an increased risk of errors, particularly [medication administration errors](#). While some interruptions are an entrenched part of patient care, the link between [interruptions and errors](#) is one example of how deficiencies in the day-to-day work environment for nurses is directly linked to patient safety.

[Longer shifts and working overtime](#) have also been linked to increased risk of error, including in one high-profile [case](#) where an error committed by a nurse working a double shift resulted in the nurse being criminally prosecuted. [Studies](#) show that medication errors are three times more likely to be committed by a nurse working shifts longer than 12.5 hours each on more than two consecutive days.⁷ Fatigue results in inattention, a decline in vigilance, poor judgment, and lack of concentration.

Nurses who commit errors are also at risk of becoming [second victims](#) of the error, a well-documented phenomenon that is associated with an increased risk of self-reported error and leaving the nursing profession. In their daily work, nurses are frequently exposed to [disruptive or unprofessional behavior](#) by physicians and other health care personnel, and such exposure has been [demonstrated](#) to be a key factor in nursing burnout and in nurses leaving their jobs or leaving the profession entirely.

[Transformational leadership](#), [personal accountability](#), teamwork, [staffing ratios](#), and practice environments each have relevance to patient safety as carried out by nurses.⁸ These themes are encompassed within an understanding of human factors, which can either facilitate, or be a barrier to, nurses completing all tasks and addressing all care within the time allotted. Under a transformational leadership structure, nurses can practice at optimal levels, motivated by supervisors who encourage critical thinking, foster skill development, and increase work satisfaction on the team, thus promoting better patient outcomes. A nurse who holds himself or herself personally accountable for maintaining a culture of safety may be less likely to

have a missed nursing care episode.⁹

"Missed" nursing care

[Missed nursing care](#) is a phenomenon of omission that occurs when the right action is delayed, is partially completed, or cannot be performed at all. In one [British study](#), missed nursing care episodes were strongly associated with a higher number of patients per nurse. Missed nursing care errors have been identified as common and universal and secondary to systemic factors that bring undesirable consequences for both patients and nursing professionals. Omission of care has been linked to both job dissatisfaction and absenteeism for nurses, as well as to medication errors, infections, falls, pressure injuries, readmissions, and [failure to rescue](#).¹⁰ In addition, If bullying is present within the workplace, more nurses are likely to self-report missed nursing care.¹¹

When evaluating cause and prevention of missed nursing care, the most consistent predictors of omission errors include staffing levels, work environment, and teamwork.^{12,13} Several conclusions can be drawn from examining missed nursing care through the lens of nursing-sensitive indicators. Missed nursing care is predominantly a structural issue of competing priorities and time pressure; therefore, adequate staffing is paramount. Organizational and unit culture promote teamwork and lead to nursing job satisfaction that is likely to reduce the pressures associated with omitted work. Strong process measures that focus on standardizing care improve outcomes, such as reduced falls and pressure injuries. Outcome measures such as Ventilator Acquired Pneumonia bundles can inform nurses on nursing care processes.

Safety and Quality Rating Systems

The [National Quality Forum](#) endorsed voluntary consensus [standards](#) for nursing-sensitive care in 2004. These included patient-centered outcomes considered to be markers of nursing care quality (such as falls and pressure ulcers) and system-related measures including nursing skill mix, nursing care hours, measures of the quality of the nursing practice environment (which includes staffing ratios), and nursing turnover. These measures are intended to illustrate both the quality of nursing care and the degree to which an institution's working environment supports nurses in their patient safety efforts. Nurse-sensitive indicators are a metric for the degree to which acute care hospitals provide quality, patient safety, and promote a safe and professional work environment. Nurse-sensitive measures continue to set the standard for quality and safety in care in the acute care setting. As of 2021, there are 39-nurse sensitive measures.

Magnet Hospital Recognition

The [Magnet Hospital Recognition](#), administered by the American Nurses Credentialing Center, is a recognition program acknowledging hospitals that deliver superior patient care and also attract and retain high-quality nurses. Beginning in 1983, the program sought to identify hospitals which had lower turnover rates and above average retention for nurses. This primer has identified institutional characteristics which correlate with higher retention rates. These characteristics are identified by Magnet as a pathway to excellence and include items such as professional development, continuing education, shared decision making, quality, well-being, and leadership.

Public Reporting

In the past decade, public reporting of quality data has mushroomed. Two sources of this data, [Hospital Compare](#) and [Nursing Home Compare](#) websites, are created jointly by CMS and the Hospital Quality Alliance, and geared toward providing consumer data on the degree to which hospitals provide recommended care to their patients. The goal was to facilitate easy access to quality data for consumers to be able to make informed decisions. Types of data provided to consumers relevant to nursing care include patient experience, timely and effective care, and nurse staffing. In October of 2019, CMS created the [Five-Star Quality Rating System](#) to help patients, families, and caregivers navigate quality in the nurse home setting. This rating system gives each organization (e.g., hospital or nursing home) a star score from 1 to 5 based on areas such as nurse staffing and quality measures.

The multiple factors discussed including the high-risk nature of the work, increased stress caused by workload and interruptions, and the risk of burnout due to involvement in errors, the second victim phenomenon, or exposure to disruptive behavior—likely combine with unsafe conditions precipitated by low nurse-to-patient staffing ratios to increase the risk of adverse events. Using a [systems analysis](#) perspective, active errors made by individual nurses likely combine with these aligned holes in the "[Swiss Cheese Model of Medical Errors](#)" to result in preventable harm to patients.

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