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State Nursing Shortages and Patient Satisfaction

More RNs—Better Patient Experiences

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This study of 827,430 patients, 733 hospitals, and 25 states compares state performance in patient satisfaction with the supply of registered nurses. A significant, positive relationship exists between a state's supply of registered nurses and patients' evaluations of their care experiences. Hospitals in states with nursing shortages may be challenged by national comparisons of patient satisfaction and should take these results into account when devising their quality improvement strategy.

Key words: *nurses, patients, patient satisfaction, quality of care, staffing, workforce*

DURING the past century, nurses have risen from a position of subjugation¹ to the second highest concern on the minds of healthcare executives.² These concerns are grounded in reality. Labor represents 65% of hospital operating costs, and shortages in the supply of registered nurses (RNs) are a leading driver of hospital cost increases.³ The current RN supply is overly reliant on older, aging RNs,⁴ and the US Bureau of Labor Statistics forecasts the demand for RNs to outweigh that of every other occupation over the next 10 years.⁵ Despite a recent strengthening in the nursing market, significant shortages persist across most states.^{6,7}

Shortages in supply of nurses are not without consequence. Robust research has shown the impact of nurse staffing on outcomes. Hospitals or units with high nurse-to-patient ratios (ie, high number of patients per nurse) are characterized by numer-

ous subpar performance in clinical quality, such as higher mortality rates among both inpatients^{8,9} and intensive care unit (ICU) patients.¹⁰ Specific events or process measures are also related to nurse-to-patient ratios, such as failure to rescue rates,⁸ needle-stick injuries,¹¹ near miss incidents,¹² adverse events,¹³ and postoperative medical complications among ICU patients.¹⁴ Complications specifically connected to nurse-to-patient ratios include postoperative respiratory, cardiac, and other complications,¹⁵ increased risk for pulmonary failure and reintubation,¹⁶ and infectious complications (eg, septicemia), leading to a 39% increased length of stay and 32% increased resource usage among ICU patients.¹⁷ All of this increases the unreimbursed hospital costs per patient by an average \$1248.¹⁶

Units with high nurse-to-patient ratios have lower nurse-rated quality of care.¹⁸ This situation of increased work and lower clinical quality affects nurses' worklife experience; nurses on units with high nurse-to-patient ratios experience greater incidence of nurse burnout and greater job dissatisfaction.⁸ In response to these findings, several states (most notably, California) adopted minimum nurse-to-patient ratios.¹⁹ Despite widespread skepticism,²⁰

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difficult implementation,²¹ and few discernable results,²² many other states are considering such measures.^{23,24}

While these relationships between nurse staffing and quality may be new to the healthcare policymaking community, politicians, and the general public, they are well known to nurses. Chief nursing officers and RNs surveyed on decreases in nurse-to-patient staffing ratios report seeing the effects on care processes including communication with patients, timely response to pages and telephone calls, delays in patient discharges, and the time patients have to wait for tests and procedures.²⁵ High actual and perceived nurse-to-patient ratios also affect nurses' perspectives on nursing care quality at their institutions. Nurses' assessments of nursing care quality are associated with both structural (workload) and process of care indicators (unfinished clinical care and patient safety problems).²⁶ There is little doubt that nurses are the first to detect differences in staffing ratios, which affect their perceptions of the organization, leadership, and the quality of nursing care at the institution.

Recently, a longitudinal study by Seago and colleagues²⁷ of 3 units in a university teaching hospital found that patients' satisfaction as measured by an independent organization (Press Ganey, South Bend, Ind) increased when the number of nursing hours per patient increased. This study demonstrated that on a micro level nurse staffing is detectable by patients and affects their perceptions of the care experience.

What remains unanswered is whether nursing shortages have any effect on patients' experience of care systematically, across an entire hospital or hospitals across a region. Do patients perceive the repercussions of shortages in the nursing workforce? Do delayed and modified care processes affect patients' evaluations? Do patients see or experience the effects of a nursing shortage? To date, only one study has investigated this. A study of 40 California hospitals found a weak but statistically significant correlation between nurse staffing and a single dimension of the Pa-

tients' Evaluation of Performance in California survey.²⁸ However, the California survey's reliability and validity were questioned.²⁹ It has since been replaced with HCAHPS[®], the patient satisfaction survey developed by the Agency for Healthcare Research and Quality and sponsored by the CMS. California's current public reporting patient satisfaction survey initiative, California Hospital Assessment and Reporting Taskforce, uses the new national standard for patient satisfaction, HCAHPS.

As more states consider regulating nurse-to-patient ratios, launching public reporting patient satisfaction initiatives, and as the Centers for Medicare & Medicaid Services move forward with national public reporting of patient satisfaction (HCAHPS), a pressing need exists to understand the effects of nurse staffing levels on patients' perceptions of their care experience. The HCAHPS initiative will be an ongoing priority for hospitals, as participation will be a requirement for hospitals to receive their full annual market basket increase* in Medicare reimbursement. Hospitals would benefit from knowing whether an independent variable—such as the state supply of RNs—could influence patient satisfaction. Similarly, the supply of RNs in a state can affect a hospital's ability to fully staff in a cost-effective manner. This study uses the largest national data set of inpatient care perspectives to investigate the relationship between states' supplies of nurses and patient satisfaction with nursing care.

METHODS

Data sources

RN employment data were taken from the National Sample of RNs, US Department of Health and Human Services, Health Resources and Service Administration, Bureau of Health

*The market basket increase in Medicare payments is an annual adjustment for inflation in the cost of providing medical care for that particular health service market.

Professions, Division of Nursing. Patient satisfaction data were derived from the Press Ganey National Inpatient Database, chosen because it is the largest and most representative national database, containing approximately 30% of all hospitals and 40% of all hospitals with more than 100 beds. Healthcare organizations partner with Press Ganey, an independent research organization, to scientifically assess patient satisfaction with the experience of care.

Patient satisfaction instrument

The survey instrument assessed patients' satisfaction with the experience of care using 49 standard questions in 10 separate areas sequenced chronologically to mirror the patient experience from admission through tests and treatment to discharge. Each section had 3 to 5 questions that represented valid and reliable measures for that dimension of care (eg, the nursing section measures patient perceptions of nursing care quality). Each question used a balanced 5-point Likert-type response scale (1 = very poor; 2 = poor; 3 = fair; 4 = good; and 5 = very good). The mean score for each section was calculated.

Six questions comprise the nursing section used for measuring patient perceptions of nursing care quality:

1. Friendliness/courtesy of the nurses
2. Promptness in responding to the call button
3. Nurses' attitude toward your requests
4. Amount of attention paid to your special or personal needs
5. How well the nurses kept you informed
6. Skill of the nurses

The mean of these 6 questions represents the composite nursing section score. The instrument has undergone rigorous psychometric tests and meets or exceeds all standards for internal and discriminant validity and reliability (Cronbach $\alpha = .98$).^{30,31}

Data collection methods

Patients typically received postal questionnaires within 1 week of discharge with a cover letter from the facility and postage-paid return

envelope. This rapid time frame ensured that patients were able to fully recall and evaluate their experience.³² Response rates ranged from 20% to 40% by hospital, an acceptable range for 1-wave healthcare surveys mailed without a prior agreement to participate.³³ This survey methodology has been employed to assess patient perspectives of quality on a national level and across a variety of healthcare settings.³⁴⁻³⁷

Sample characteristics

Patient satisfaction data collected between January 1 and December 31, 2000, were aggregated by facility. This sample time frame was selected to match the RN supply data. To be included in the sample, each facility had to have a minimum of 30 respondents. Facility scores were then averaged to determine a state score. To maintain confidentiality and optimize representativeness, each state had to have a minimum of 10 facilities. Table 1 outlines the average hospital bed size, sample size, and number of facilities by state. All told, the study included 827,430 patients from 733 facilities in 25 states.

Limitations

Although this study represents the largest, most comprehensive data set of patient satisfaction available, not possessing data from all 50 states is a limitation. Hospitals that voluntarily choose to benchmark patient satisfaction with an independent research organization may be systematically different than hospitals that opt not to participate.

RESULTS

We compared states' ratio of working RNs with population (employed RNs per 100,000) to each domain of care (ie, nursing, physician, admission, discharge, room, meals, personal issues, visitors and family, tests and treatment, and overall assessment). The strongest and most significant correlation was between RN supply and patients' satisfaction with the experience of nursing care (Pearson $r = 0.54$; $r^2 = 0.29$; $P < .001$). Figure 1 illustrates the

Table 1. State hospital characteristics, satisfaction, and labor supply by state

State	Number of hospitals	Number of patients	Average bed size	Satisfaction with nursing	Overall satisfaction	Employed nurses per 100,000 residents
Alabama	28	29,608	267	86.8	84.2	766
Arkansas	12	16,493	305	84.9	82.2	701
Arizona	12	18,615	238	85.4	81.4	628
California	56	58,041	262	84.6	81.9	544
Connecticut	22	21,632	248	88.3	84.7	942
Florida	29	40,407	363	85.9	82.0	785
Iowa	18	23,318	275	88.2	84.7	1,060
Illinois	48	66,185	364	86.3	83.0	819
Indiana	43	37,311	241	87.9	84.8	761
Kansas	11	8,171	299	87.1	84.5	885
Louisiana	18	20,285	425	85.7	82.9	834
Massachusetts	18	18,096	210	88.7	85.0	1,194
Maryland	10	11,468	225	83.5	80.7	856
Michigan	24	34,367	405	83.7	80.3	798
Missouri	20	19,370	326	86.0	83.0	960
North Carolina	12	14,729	369	86.2	82.9	858
New Jersey	58	80,268	344	85.5	82.2	800
New York	51	62,199	363	83.7	80.6	843
Ohio	41	44,685	347	85.8	82.6	882
Oklahoma	14	12,378	277	86.2	83.5	635
Pennsylvania	69	83,503	338	86.4	82.7	1,010
South Carolina	17	20,683	292	86.4	84.0	728
Tennessee	26	16,718	256	85.5	82.4	872
Texas	65	64,613	325	84.3	81.9	606
Vermont	11	4,287	80	90.3	86.5	957

data showing that when the ratio of working RNs to state population increases, perceived nursing care quality increases, and vice versa.

States' supply of working RNs per patient was significantly and positively associated with patients' overall satisfaction with the experience of care ($r = 0.44$; $P < .05$); personal issues (eg, emotional/spiritual needs, pain, involvement in decision making) ($r = 0.42$; $P < .05$); discharge process ($r = 0.42$; $P < .05$); and tests and treatment ($r = 0.48$; $P < .05$). All other dimensions of the inpatient survey demonstrated no statistically significant relationship to the state supply of RNs.

The discovery of a relationship between RN supply and patient satisfaction introduces a new potential explanatory variable for sys-

temic variations in patient satisfaction. States with large populations, such as California and Texas, frequently search for reasons why their regions consistently report lower than average patient satisfaction results. In this study, California and Texas report 1.78% ($T = -11.6$; $P < .001$) and 2.13% ($T = -13.8$; $P < .001$) lower than average patient satisfaction while also having the lowest RN supply per patient, 34.38% ($T = -24.1$; $P < .001$) and 26.9% ($T = -18.9$; $P < .001$) below the national average, respectively.

Another frequently reported variation in patient satisfaction is bed size. Hospitals with more licensed beds tend to perform lower in patient satisfaction. This study showed an expected negative relationship between states'

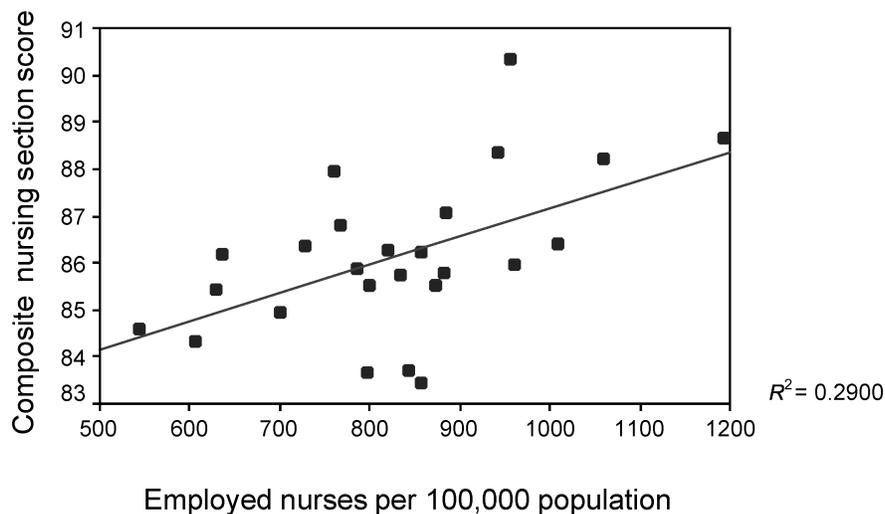


Figure 1. Patient satisfaction with nursing by registered nurses available in state. Satisfaction data from states with 10 or more reporting hospitals ($n = 25$). Employment data from Bureau of Labor Statistics records.

average bed size and patient satisfaction ($r = -0.57$; $P < .05$). Interestingly, states' average bed size and the supply of RNs per patient were not correlated with each other (Pearson $r = -0.15$; $P = .1$). This indicates that RN supply and bed size are relatively independent influences on hospitals' patient satisfaction performance. In sum, states' ratio of available RN supply to patients presents one previously unconsidered explanatory variable for systematic variations in patient satisfaction.

DISCUSSION

States with a high ratio of RNs to the total population (ie, high number of patients per nurse) experience a nursing labor shortage that affects patients' hospital experiences, most saliently, their experiences with nursing care. When nurse staffing is associated with so many clinical quality outcome measures, it comes as little surprise that a link to the outcome of patient satisfaction also exists. Hospitals in states with more working RNs delivering care have higher levels of patient satisfaction with nursing care. Restated from the consumer perspective—patients in states with more working RNs report better nurs-

ing care and provide higher ratings for nurses' quality of communication, coordination, information provision, and interpersonal care. Conversely, patients in states with fewer RNs have greater dissatisfaction with the quality of nursing care.

Beyond the nursing section, strong positive relationships were also observed in other areas of acute care that intimately involve nurses, such as pain management, emotional and spiritual care, the discharge process, tests and treatment, and overall satisfaction. Notably, the aspects of care in which nurses participate minimally or not at all were not associated with the state supply of RNs, including patients' ratings of physicians, admissions, meals, and hospital rooms. The results confirm on a macro level the relationship documented by Seago and colleagues²⁷ and seen anecdotally by many hospitals on a unit level—more RNs results in higher patient satisfaction.

Implications for health policy

The results may strengthen state hospital associations' interest in their states' policies and programs to support and attract RNs. As collective representatives of the state hospitals, the associations would presumably prefer to

Table 2. State policy mechanisms to increase supply of nurses

- Create a state-level office charged with increasing the supply of nurses and nurse extenders.
- Improve nurses' work environment.
- Raise Medicare and Medicaid reimbursement on the condition that the increase will be directed toward increased compensation for nurses.
- Expand the capacity of nursing schools to educate more registered nurses; increase resources available to recruit nursing faculty and expand existing nursing school facilities.
- Launch scholarships and loan incentives.
- Explicitly tie nursing documentation and reporting regulations to patient outcomes.

not see their member hospitals at any disadvantage in national comparisons. Fortunately, state policies to increase the supply of RNs can have a positive, measurable effect on patient experiences.

State policymakers and stakeholders have numerous mechanisms at their disposal to increase the supply of RNs (Table 2); however, many remain unused.³⁸ Programs and policies can be implemented to attract and retain nursing staff. Beyond increased scholarships and funding for nursing schools, states can provide and heavily promote financial aid incentives for persons who return to school. Some hospitals have successfully promoted nursing careers among these groups at the local level; these efforts could be expanded to statewide initiatives. States that provide state income tax incentives or reduce or eliminate interest on state-school loans may also attract RNs. Real, positive returns are possible with some creative state policymaking.

Implications for hospitals

Given the impending public reporting of patient perspectives through the Centers for Medicare & Medicaid Services' HCAHPS ini-

tiative, hospitals in states with nursing shortages may find themselves at a disadvantage. Hospitals in states facing RN supply shortages will likely face a greater challenge to achieving their performance goals in future national patient satisfaction rankings and delivering highly satisfying patient experiences. Yet nurse supply is not the only factor determinative of patient satisfaction. From the research literature and our experience, these challenges can be overcome using several strategies: (1) recognizing and supporting nursing for the dominant role it plays in determining patient satisfaction, (2) improving nurse staffing in areas of low patient satisfaction, (3) adjusting patients' perceptions of nurse staffing, (4) dedicating resources to measuring and improving nurse satisfaction, and (5) senior leadership involvement and support for clinical and service quality improvement.

By now, nursing care should receive universal recognition as the principal factor in determining the inpatient acute care experience. Repeatedly, across many different patient satisfaction studies, nursing care has consistently emerged as a leading influence on patients' satisfaction, including HCAHPS.³⁹⁻⁴²

Increasing nurse staffing could lead to increases in patient satisfaction via 2 methods: patients' perceptions of nurse staffing directly affecting their evaluation of care and improved nurse staffing positively affecting nurses' own satisfaction, which in turn influences the quality of service they provide to patients. Regarding the former, it is important to note that patients' *perceptions* of nurse staffing are determined by their interaction with nurses; in other words, how nurses communicate, discuss, and inform patients about staffing will influence patients' perceptions as much or more than the actual staffing level.⁴³ Regarding the latter, recent research has found direct relationships between employee satisfaction and both patient satisfaction and clinical quality. Higher nurse satisfaction leads to lower burnout, lower turnover, and better interpersonal relationships with patients—all factors

that contribute to clinical quality and patient satisfaction.⁴⁴⁻⁴⁶

Hospital leadership decisions and behaviors influence employee and nurse satisfaction. Hospital leaders who adhere to certain proven best practices have hospitals with higher employee satisfaction, productivity, and retention.⁴⁷ One of the greatest impacts senior leaders can have is through the managers they hire and promote. The manager relationship represents a critical pressure point for nurses; the quality of this relationship affects nurses' satisfaction, productivity, and ultimately turnover.⁴⁸⁻⁵⁰ Nurses often do not want to leave organizations—they leave poor managers.⁵¹

Senior leaders also make crucial resource allocation decisions that affect nurses' work environment and information technology support, both of which can influence nurse satisfaction, retention, and patient safety.⁵²⁻⁵⁴ Senior leadership's active involvement in and support of quality improvement initiatives are predictive of hospitals' improvement.⁵⁵

Clearly, hospital leaders have many tactics at their disposal to influence patient satisfaction in their facilities.

CONCLUSIONS

Hospitals in states with more working RNs per population see higher levels of patient satisfaction with nursing care. Those states demonstrate higher patient ratings of nurses' quality of communication, coordination, information provision, and interpersonal care. Conversely, patients in states with fewer RNs have greater dissatisfaction with the quality of nursing care. This study provides additional evidence supporting the centrality of nursing care to patients' satisfaction with their care experience. States and hospitals seeking high performance in patient satisfaction should seriously consider the RN labor supply and their nurse staffing ratios. Nurse staffing provides a tremendous opportunity for improving patient satisfaction and loyalty.

REFERENCES

1. Starr P. *The Social Transformation of American Medicine*. New York: Basic Books; 1984.
2. Evans M. What really matters most [serial online]. *Modern Healthcare*. January 9, 2006. Available at: <http://modernhealthcare.com/apps/pbcs.dll/article?AID=/20060109/REG/601090310>.
3. Schactman D, Altman SH, Eilat E, Thorpe KE, Doonan M. The outlook for hospital spending: rapid growth is likely to persist. *Health Aff (Millwood)*. 2003;22:12-26.
4. Buerhaus PI, Staiger DO, Auerbach DI. Is the current shortage of hospital nurses ending? *Health Aff (Millwood)*. 2003;26:191-198.
5. Piotrowski J. RNs become the No. 1 workforce demand [serial online]. *Modern Healthcare*. February 12, 2004.
6. Buerhaus P, Staiger D, Auerbach D. New signs of a strengthening U.S. nurse labor market? *Health Aff (Millwood)*. 2004;(suppl):W4-526-33.
7. Unruh LY, Fottler MD. Projections and trends in RN supply: what do they tell us about the nursing shortage? *Policy Polit Nurs Pract*. 2005;6:171-182.
8. Aiken LH, Clarke SP, Sloane DM, Sochalski J, Silber JH. Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *JAMA*. 2002;288:1987-1993.
9. Bond CA, Raehl CL, Pitterle ME, Franke T. Health care professional staffing, hospital characteristics, and hospital mortality rates. *Pharmacotherapy*. 1999;19:130-138.
10. Pronovost PI, Jenckes MW, Dorman T, et al. Organizational characteristics of intensive care units related to outcomes of abdominal aortic surgery. *JAMA*. 1999;281:1310-1317.
11. Clarke SP, Sloane DM, Aiken LH. Effects of hospital staffing and organizational climate on needlestick injuries to nurses. *Am J Public Health*. 2002;92:1115-1119.
12. Clarke SP, Rockett JL, Sloane DM, Aiken LH. Organizational climate, staffing, and safety equipment as predictors of needlestick injuries and near-misses in hospital nurses. *Am J Infect Control*. 2002;30:207-216.
13. Kovner C, Jones C, Zhan C, Gergen PJ, Basu J. Nurse staffing and postsurgical adverse events: an analysis of administrative data from a sample of U.S. hospitals, 1990-1996. *Health Serv Res*. 2002;37:611-629.
14. Pronovost PI, Dang D, Dorman T, et al. Intensive care unit nurse staffing and the risk for complications after abdominal aortic surgery. *Eff Clin Pract*. 2001;4:199-206.
15. Dang D, Johantgen ME, Pronovost PJ, Jenckes MW, Bass EB. Postoperative complications: does

- intensive care unit staff nursing make a difference? *Heart Lung*. 2002;31:219-228.
16. Dimick JB, Swoboda SM, Pronovost PJ, Lipsett PA. Effect of nurse-to-patient ratio in the intensive care unit on pulmonary complications and resource use after hepatectomy. *Am J Crit Care*. 2001;10:376-382.
 17. Amaravadi RK, Dimick JB, Pronovost PJ, Lipsett PA. ICU nurse-to-patient ratio is associated with complications and resource use after esophagectomy. *Intensive Care Med*. 2000;26:1857-1862.
 18. Aiken LH, Clarke SP, Sloane DM. Hospital staffing, organization, and quality of care: cross-national findings. *Nurs Outlook*. 2002;50:187-194.
 19. Seago JA, Spetz J, Coffman J, Rosenoff E, O'Neil E. Minimum staffing ratios: the California workforce initiative survey. *Nurs Econ*. 2003;21:65-70.
 20. O'Neil E, Seago JA. Meeting the challenge of nursing and the nation's health. *JAMA*. 2002;288:2040-2041.
 21. Reilly P. Ratio law hits hard in California [serial online]. *Modern Healthcare*. January 12, 2004.
 22. Donaldson N, Bolton LB, Aydin C, Brown D, Elashoff JD, Sandhu M. Impact of California's licensed nurse-patient ratios on unit-level nurse staffing and patient outcomes. *Policy Polit Nurs Pract*. 2005;6:198-210.
 23. Gerardi T. Staffing ratios in New York: a decade of debate. *Policy Polit Nurs Pract*. 2006;7:8-10.
 24. *Nursing Ratios, Recruitment, Retention, and Unions*. San Diego, Calif: The Government Institute; 2004.
 25. Buerhaus PI, Donelan K, Ulrich BT, Norman L, Williams M, Dittus R. Hospital RNs' and CNOs' perceptions of the impact of the nursing shortage on the quality of care. *Nurs Econ*. 2005;23:214-221, 211.
 26. Sochalski J. Is more better? The relationship between nurse staffing and the quality of nursing care in hospitals. *Med Care*. 2004;42:II67-II73.
 27. Seago JA, Williamson A, Atwood C. Longitudinal analyses of nurse staffing and patient outcomes. More about failure to rescue. *J Nurs Adm*. 2006;26:13-21.
 28. Bolton LB, Aydin CE, Donaldson N, Brown DS, Nelson MS, Harms D. Nurse staffing and patient perceptions of nursing care. *J Nurs Adm*. 2003;33:607-614.
 29. Drain M, Clark PA. Measuring experience from the patient's perspective: implications for national initiatives. *J Healthc Qual*. 2004;26:W4-W16. Available at: http://www.nahq.org/journal/ce/article.html?article_id=214. Accessed August 7, 2006.
 30. Kaldenberg DO, Mylod DM, Drain M. Patient-derived information: satisfaction with care and post-acute care environments. In: Goldfield N, Pine M, Pine J, eds. *Measuring and Managing Health Care Quality: Procedures, Techniques, and Protocols*. 2nd ed. New York: Aspen; 2002:4:69-4:89.
 31. Clark PA, Drain M, Gesell SB, Mylod DM, Kaldenberg DO, Hamilton J. Patient perceptions of quality in discharge instruction. *Patient Educ Couns*. 2005;59(1):56-68.
 32. Bredart A, Razavi D, Robertson C, et al. Timing of patient satisfaction assessment: effect on questionnaire acceptability, completeness of data, reliability and variability of scores. *Patient Educ Couns*. 2002;46:131-136.
 33. Kelley K, Clark B, Brown V, Sitzia J. Good practice in the conduct and reporting of survey research. *Int J Qual Health Care*. 2003;15:261-266.
 34. Clark PA, Drain M, Malone MP. Addressing patients' emotional and spiritual needs. *Jt Comm J Qual Saf*. 2003;29:659-670.
 35. Clark PA. Medical practices' sensitivity to patients' needs. Opportunities and practices for improvement. *J Ambul Care Manage*. 2003;26:110-123.
 36. Drain M. Quality improvement in primary care and the importance of patient perceptions. *J Ambul Care Manage*. 2001;24:30-46.
 37. Gesell SB. A measure of satisfaction for the assisted-living industry. *J Healthc Qual*. 2001;23:16-25.
 38. Smith AP. Responses to the nursing shortage: policy, press, pipeline and perks. *Nurs Econ*. 2002;20:287-290.
 39. Sitzia J, Wood N. Patient satisfaction: a review of issues and concepts. *Soc Sci Med*. 1997;45:1829-1843.
 40. Laschinger HS, Hall LM, Pedersen C, Almost J. A psychometric analysis of the patient satisfaction with nursing care quality questionnaire: an actionable approach to measuring patient satisfaction. *J Nurs Care Qual*. 2005;20:220-230.
 41. Jackson JL, Chamberlin J, Kroenke K. Predictors of patient satisfaction. *Soc Sci Med*. 2001;52:609-620.
 42. Keller S, O'Malley AJ, Hays RD, et al. Methods used to streamline the CAHPS Hospital Survey. *Health Serv Res*. 2005;40:2057-2077.
 43. Schmidt LA. Patients' perceptions of nurse staffing, nursing care, adverse events, and overall satisfaction with the hospital experience. *Nurs Econ*. 2004;22:295-306, 291.
 44. Press Ganey Associates. Patient, physician and employee: satisfaction trifecta brings bottom line results. 2006. Available at: <http://www.pressganey.com/files/roiv2.pdf>. Accessed August 9, 2006.
 45. Newman K, Maylor U, Chansarkar B. The nurse retention, quality of care and patient satisfaction chain. *Int J Health Care Qual Assur Inc Leadersb Health Serv*. 2001;14:57-68.
 46. Vahey DC, Aiken LH, Sloane DM, Clarke SP, Vargas D. Nurse burnout and patient satisfaction. *Med Care*. 2004;42:II57-II66.
 47. McNeese-Smith D. Increasing employee productivity, job satisfaction, and organizational commitment. *Hosp Health Serv Adm*. 1996;41:160-175.
 48. Andrews DR, Dziegielewska SF. The nurse manager: job satisfaction, the nursing shortage and retention. *J Nurs Manag*. 2005;13:286-295.
 49. Lageson C. Quality focus of the first line nurse manager and relationship to unit outcomes. *J Nurs Care Qual*. 2004;19:336-342.

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50. Anthony MK, Standing TS, Glick J, et al. Leadership and nurse retention: the pivotal role of nurse managers. *J Nurs Adm.* 2005;35:146-155.
51. Sherman VC. *Raising Standards in American Health Care: Best People, Best Practices, Best Results.* San Francisco: Jossey-Bass; 1999.
52. Laschinger HK, Leiter MP. The impact of nursing work environments on patient safety outcomes: the mediating role of burnout/engagement. *J Nurs Adm.* 2006;36:259-267.
53. Hassmiller SB, Cozine M. Addressing the nurse shortage to improve the quality of patient care. *Health Aff (Millwood).* 2006;25:268-274.
54. Krohn R. How healthcare IT can address the nursing shortage. *J Healthc Inf Manag.* 2006;20:21-23.
55. Bradley EH, Herrin J, Mattern JA, et al. Quality improvement efforts and hospital performance: rates of beta-blocker prescription after acute myocardial infarction. *Med Care.* 2005;43:282-292.