Chapter 24. Restructuring and Mergers

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Background

During the first half of the 20th century, there was a huge increase in the number of free-standing general hospitals in the United States.[1] At that time, registered nurses (RNs) typically practiced in hospitals. Consequently, there are strong parallels between the evolution of the nursing profession and the growth of hospitals as the central structure in the U.S. health care system.[2] By the 1980s, however, a variety of initiatives were implemented for the purpose of curtailing the rapid rise in health care costs.[3, 4] Based upon the assumption that hospital care was very expensive, cutting inpatient care was a central strategy in the attempt to control the cost of health care.[5] Moreover, the focus on fiscal challenges shifted the health care industry into a business mode that substantially altered the experiences of patients, as well as the roles of health care personnel.[6]

Cost-cutting initiatives over the past 20-odd years contributed to tremendous turmoil in health care. The initiatives were often introduced concurrently and without empirical evaluations to determine their effectiveness. Among the early initiatives was a prospective payment system based upon Diagnosis Related Groups (DRGs), which differed from the historical system of retrospective payments that covered all services rendered. DRGs established fixed prices for care based on set criteria, such as diagnosis, therapy, and discharge status. These fixed prices altered hospital reimbursements, which in turn changed their incentives. As a result, for example, lengths of stay were shortened. Patients with complex care needs moved through the inpatient care setting much more rapidly than in the past, giving rise to the phrase "sicker and quicker" to reflect this dramatic change. In addition, preauthorization was implemented to reduce hospital use. Together, DRGs and preauthorization provided the impetus to shift care from the hospital to the outpatient setting and the home.

Fewer inpatients required fewer staff. Reductions in hospital personnel helped to reduce labor costs; they also raised concerns about the effects of staffing on quality of care and nurses' job satisfaction.[7] By the year 2000, although the hospital remained the primary place of employment for RNs, 40 percent of RNs worked in other settings.[8] This represented a significant shift over 25 years.

Also contributing to the turmoil in health care during the 1980s was the rapid growth in managed care. All types of managed care programs attempted to control costs by decreasing unnecessary use of health care. To support this goal, primary care physicians assumed a more dominant role in health care by becoming "gatekeepers," allocating health care resources such as referrals to specialists.

Managed care also prompted the integration of health services and providers. Through horizontal integration, free-standing hospitals merged into multihospital systems owned by central organizations (e.g., Humana), and physicians in private practices joined group practices. Through vertical integration, a broad array of services covering the care continuum—from ambulatory care to long-term care—were pulled together into comprehensive delivery systems.[4] Ideally, these mergers helped to streamline functions, reduce administrative redundancy, and negotiate reduced rates when purchasing supplies, equipment, and pharmaceutical products.

These often radical changes proceeded, however, with little empirical evidence to guide them. Evaluations were uncommon, and those that were conducted could not keep pace with the speed of changes resulting from restructuring and mergers. A report from the Institute of Medicine[9] concluded that despite enormous organizational turmoil, little progress was made toward restructuring health care systems in ways that meaningfully addressed quality and cost concerns. Likewise, a critical review of restructuring studies found mixed signals about what was accomplished through these organizational changes.[3] According to Aiken and colleagues[10] (p. 463), "What we know about changes in organization and structure and the potential for those changes to affect patient outcomes pales by comparison to what we do not know."

Assessments about how restructuring and mergers affected patients and staff are more a look through the rearview mirror because they occurred after the fact. Nonetheless, the findings are informative, especially when considered in the context of current changes such as recent growth in hospital construction.[11] Today, ongoing change, not stability, is the order of the day for health care. Lessons from the past can be used as a platform for more proactive responses to future changes.

Research Evidence

The findings from studies of restructuring can be grouped in numerous ways. A summary of the findings is presented in Table 1. These studies represent work conducted internationally, but predominantly in the United States and Canada. Most of the evidence came from assessments of restructuring in acute care settings.[10, 12–48] Although hospital restructuring altered care delivered in other settings, little research was found that looked outside acute inpatient care. Exceptions were assessments of outpatient care following restructuring in the Department of Veterans Affairs (VA),[49, 50] an evaluation of increasing home care needs in Canada,[51] and an examination of overcrowding in an emergency department following restructuring.[52]

Studies typically addressed employee perceptions of restructuring. Overall, the changes that occurred through restructuring processes were viewed unfavorably. Most studies considered the effect of restructuring on staff nurses.[10, 12–21, 23, 25–27, 29–31, 34, 35, 38–44, 47, 48] Other health care professions such as physical therapists[33] and social workers[36] also explored how restructuring affected their respective roles. A few investigations considered restructuring from the perspective of nurses in administrative positions at the patient unit and executive levels.[12, 22, 24, 32, 38, 43] One investigation examined the views of top and middle managers from various disciplines at one VA hospital, as well as physicians and patients.[53] A pair of related investigations considered restructuring as viewed by chief executive officers.[45, 46] An important finding among these studies was that although strong leadership is essential in times of change, staff nurses' assessment of nurse managers' abilities declined considerably between 1986 and 1998, as did the perception of nurse executive power.[10]

Few studies explored ways to mitigate the deleterious effects of restructuring. There is beginning evidence, however, that empowerment[32] and leadership style[20] may reduce burnout and increase job satisfaction. One study explicitly examined rebuilding after restructuring.[24] Staffing changes were central to the rebuilding efforts, especially increases in licensed personnel and senior support staff, and decreases in part-time, temporary, agency, and contract nurses. In three studies that examined cost, results reflected increased costs at both the unit level[13] and the hospital level[45, 46] suggesting that restructuring did not achieve its intended purpose.

The majority of studies examined the relationship between restructuring and job satisfaction. Regardless of professional discipline, there was a decline in job satisfaction after restructuring.[13, 15, 18–21, 23, 30, 32, 33, 36, 45] Aspects of burnout were also frequently explored.[19–21, 32, 48] Findings consistently showed burnout was increasing, particularly emotional exhaustion, which is viewed as the core feature of burnout. Along with evaluating psychological health, studies began to detect a relationship between restructuring and increased musculoskeletal injuries.[14, 29, 42]

Restructuring can occur within a single institution, while mergers involve integrating two or more institutions. A cluster of studies explicitly addressed various aspects of mergers.[54–62] Findings from three studies verified that the success of mergers was enhanced by engaging staff from the merging institutions in the process.[54, 56, 57] Other investigations evaluated various responses of nursing staff to mergers.[58–60] In a merger involving three hospitals, for example, Jones[59] found that uncertainty about job status and feeling unappreciated minimized nurses' organizational commitment. Other studies examined mergers from the standpoint of factors effecting financial performance,[61] midwifery practice,[62] and the integration of two emergency departments.[55]

A number of investigations relied exclusively on qualitative methods to explore restructuring and mergers.[16, 17, 25, 27–29, 32, 34, 40, 53, 54, 60, 62] Themes across these studies help to edify potential sources of job dissatisfaction and burnout. For example, participants commented that restructuring altered work relations in undesirable ways,[16, 25, 27, 53, 62] including relations with management,[32] that contributed to staff distrust of the employing organization.[25, 54] Participants also identified changes in work life related to increased responsibilities, decreased resources, and overall busyness.[25, 27, 29, 32, 34, 62]

In two studies, themes emerged indicating that staff viewed restructuring as detrimental to the quality of care.[27, 32] In another two investigations, in which both patients and health care professionals were interviewed, findings indicated that patients had fewer complaints about the changes than did the hospital staff.[34, 53]

A few studies considered the effects of restructuring on quantifiable patient outcomes;[10, 13, 18, 30, 37, 42, 49, 50] two of these investigations related to outpatient care.[49, 50] The paucity of studies exploring patient outcomes related to restructuring illustrates that staff response has been the focus of most restructuring and merger studies. Although no causal connections have been demonstrated, beliefs and assertions hold that staff characteristics do affect patient outcomes. For example, recent findings show emotional exhaustion among nurses is associated with higher patient morality.[63]

Nevertheless, the staff-focused studies do not help to inform patient care per se. Moreover, the concerns addressed a decade ago by Ingersoll[26] persist—many studies are reported in journals geared to audiences that are more interested in application than scientific rigor. There is a continued need for studies with more sophisticated designs to better inform the science of patient safety. These needs expose the potential for better informing practice by combining health services research techniques with nursing research inquiries.

Table: Summary of Research Evidence Related to Restructuring and Mergers

Care setting	• Most studies evaluated restructuring and mergers in acute care settings.
Effect on costs	• Increased unit level costs. • Increased hospital level costs.
Effect on staff nurses	• Decreased job satisfaction. • Increased burnout, especially emotional exhaustion. • Increased musculoskeletal injuries.
Common sources of job dissatisfaction and burnout	• Undesirable changes in work relations, including relations with administrators, that fostered organizational mistrust. • Increased work responsibilities. • Decreased resources.
Ways to reduce the undesirable effects of restructuring and mergers	• Empowerment. • Empathetic leadership style. • Staffing changes—more licensed personnel and senior support staff; fewer part-time, temporary, agency, and contract nurses.
Effect on patient outcomes	• Results are conflicting about patient mortality. • Indicator data (e.g., falls, nosocomial infections, medication errors) vary over time, making it important to track trends. • Indicator data differ when assessed at the hospital level, the unit level, and by unit type (e.g., medical or surgical). • Overall, the evidence is scattered and inconsistent.

Evidence-Based Practice Implications

The 11 studies in Table 2 illustrate findings pertinent to patients as well as staff regarding likely connections between restructuring and patient safety. The setting for studies that met inclusion criteria was most often acute care,[10, 18, 20, 21, 32, 43, 46, 48] with research focused on outpatients[40, 50] and home care[51] also represented. Overall, however, the evidence is scattered and, at times, inconsistent. As a consequence, there are few solid implications for practice.

Patient mortality showed conflicting results. Increases in mortality were found in aggregated data from hospitals throughout the United States,[10] and decreases were found based on data from more than 2,000 patients at a single hospital.[18] A study of VA outpatients showed no statistically significant differences in mortality between patients who saw a physician for symptoms and patients who were not seen.[50]

Indicator data for falls, medication errors, nosocomial infections, and intravenous complications were examined in an 18-month longitudinal study of four medical-surgical units at one hospital.[18] The four indicators were assessed for more than 2,500 patients at four points in time. Although descriptive data reflected patternless variations in the indicators, all indicators were increasing at 18 months. The investigators noted, however, that when indexed by rate of occurrence per 100 patients, all four indicators either improved or remained unchanged.

Sovie[43] collected data from 29 university teaching hospitals in eight of the nine U.S. census regions. More than findings about the individual patient outcomes, this study illustrated important variations depending upon how data were aggregated. That is, data aggregated at the hospital level differed from data at the unit level. More striking, findings varied by unit type—medical or surgical. For falls, pressure ulcers, and urinary tract infections (UTIs), the rates were always lower on surgical units than medical units. This may have important implications for practice related to staffing considerations.

Berlowitz[49] led a study of pressure ulcers among residents of long-term care units at 150 VA medical centers nationwide. This study illustrated that, as care shifted from a focus on hospital-based specialty care to outpatient primary care, pressure ulcers increased, even after risk adjustment. Conversely, in a study from a single VA facility in California, Rubenstein and colleagues[50] demonstrated that the shift to outpatient care yielded improvements in continuity of care and preventive care related to smoking, exercise, detection of depression, and the number of individuals with hypertension receiving treatment.

The final study involving a patient focus examined home care needs for patients after hospitals closed beds.[51] Not only did more patients need care after discharge, but service intensity also increased. The intensity diminished in the second week after discharge. Although findings from single studies do not warrant practice changes, the effects of restructuring on home care needs remains an important consideration for patient safety.

The studies that evaluated various staff response to restructuring displayed a much clearer pattern to their findings—restructuring was associated with negative effects on staff.[21, 32, 48] Interested in mitigating these effects, Cummings and colleagues[20] tested a model that examined leadership style. Empathy was a critical leadership competency that served to offset the negative effects of restructuring. It was characterized by individuals who listened and responded to employee concerns.

Finally, Walston and colleagues[46] evaluated changes in hospital costs during restructuring efforts. They found that restructuring altered work processes by changing the workflow and job responsibilities. This exerted a negative influence by increasing hospital costs relative to competitors.

Research Implications

Given the current evidence, we know that reducing inpatient care as the central strategy for controlling the cost of health care has not succeeded. We know that staff report being dissatisfied with their job conditions. We also know there is no consistent pattern in the few studies that have examined the effect of organizational change on patient outcomes. Furthermore, we know that change in health care organizations is likely to continue.

Consequently, there are large gaps in knowledge about restructuring and mergers. It is not feasible to provide a comprehensive list of areas for future study. However some general notions can be outlined. A fundamental premise is that health care leaders must seriously consider which changes to implement and the best processes for introducing changes into their organizations. In addition, they need to evaluate changes—not just implement them. The evaluations need to be sufficiently comprehensive so that organizational goals (e.g., costs) do not overshadow examination of the effects of change on staff and patients. These studies also need to be longitudinal, to track the effects of restructuring over time. This strategy will help to fill the void about the effects of restructuring on patient safety.

Moreover, if existing care delivery structures are not effective, then a central question concerns how best to organize care. For example, if the Institute of Medicine's aims for the 21st-century health care system are still appropriate,[9] then what structures will lead to care that is safe, effective, patient-centered, timely, efficient, and equitable? Continuity of care before and after restructuring and mergers is an aspect of care that could benefit from in-depth exploration because it could contribute to improvements in each of the desired aims. Acute care, outpatient

care, and home care have all been affected by restructuring. What mechanisms could be introduced to enhance continuity from unit to unit and across the care continuum?

Many studies of restructuring follow a sociological view of organizations; a psychological framework has been used less often. Human relations—among both staff and patients—are central to caregiving organizations. Kahn[64] asserts that interpersonal transactions are at the core of caregiving organizations. He believes that resilient organizations have members who are able to learn and grow, even in difficult environments. Resilient organizations are better able to absorb stress and maintain the capacity to function effectively. Therefore, regardless of the structure, health care organizations would benefit from investigations that examine interpersonal conditions at work. Interventions could then be developed to help staff improve relationships with one another and work together more effectively. To date, studies have not examined the effects of restructuring on the dynamics among caregivers and between caregivers and patients. In addition, leadership as a linchpin of relationships between staff and administrators begs to be better understood.

From the perspective of patient outcomes, however, we know very little. There is no discernible pattern in existing findings; there is no meaningful statement that can be made. The impact of restructuring on patient safety remains unknown. Measurement and methods questions are important considerations to enhance that understanding—which indicators to use, how they are defined, how they are measured, what the unit of analysis is. Decreased resources, including sufficient staff, surfaced as a concern in studies of restructuring. It would be beneficial to assess different care structures, determine the work that needs to be done, determine who needs to do it, provide the proper type and number of staff to do the work, and then assess which organizational structures yield the best opportunity for providing safe care to patients.

It would also be extremely useful to pursue a series of qualitative studies to better depict the current state of health care organizations. Data could be collected from staff at all levels of individual organizations as well as vertically and horizontally integrated systems of care. Data could also be collected from patients getting care in different venues, including the home. Family member perspectives would be valuable, too. Such studies would be very complex and difficult, but they could elucidate key issues and concerns. These could then be used to construct interventions or guide future restructuring efforts.

This is just the beginning of an almost endless list of ideas that could be studied to advance the understanding of restructuring and mergers. Future endeavors need to be more proactive in assessing organizational change early in the change process. They also need to approach questions over time, using a comprehensive set of variables, as well as sophisticated methodological and statistical techniques, to truly advance the understanding of restructuring on the staff as well as patient safety.

Conclusion

As reflected in the Table (see above), most studies of restructuring and mergers have been conducted in acute care settings. Many of these studies have examined the effects of restructuring and mergers on cost, staff nurses, and patient outcomes. In the aggregate, restructuring and mergers did not achieve the desired reductions in cost. However the upheaval accompanying restructuring efforts and mergers can be related to lower job satisfaction among nurses and increased burnout. The effects of restructuring and mergers on patient care, however,

are more difficult to understand because the evidence varies over time, by hospital or unit, and by unit type.

There is convergence in findings about sources of job dissatisfaction and burnout related to restructuring and mergers. Organizational and unit leaders would be wise to carefully assess work relations, work responsibilities, and the availability of resources, all of which may be sources of dissatisfaction and burnout. It would also behoove the leaders to consider the evidence that illustrates ways to minimize the undesirable effects of restructuring and mergers. These include empowerment, empathetic leadership, and staffing changes that increase the number of licensed nurses who are employed by the institution.

Search Strategy

A reference librarian assisted in running database searches in both MEDLINE[®] and CINAHL[®] to identify literature for this review. Both databases were searched from 1995 to 2005, using the same two MESH headings: hospital restructuring and health facility mergers. The searches were limited to research reports published in the English language. A total of 149 potential publications were identified, 56 in MEDLINE[®] and 93 in CINAHL[®]. Based upon an assessment of the abstracts, 67 of the publications were regarded as being suitable for inclusion in this review. The 82 papers that were omitted were a combination of brief reports or abstracts, topics not suitable to this review (i.e., mental health triage tools), and doctoral dissertations.

After reading the 67 publications in their entirety, 14 were omitted from further consideration. Some of these papers, for example, were only tangentially related to restructuring and mergers, a few were redundant publications, and others were about instrument development. This review is therefore based on 53 research reports.

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Evidence Table: Restructuring and Mergers

Source	Safety Issue Related to Clinical Practice	Design Type	Study Design, Study Outcome Measure(s)	Study Setting & Study Population	Study Intervention	Key Finding(s)
Aiken 2000[10]	Staffing	Cross-sectional	Design: Level 4; Patient outcomes: mortality (Level 1)	Hospitals throughout the United States, 646 CEOs, 2,000 nurses, patient data from American Hospital Association and Health Care Financing Administration databases	Restructuring: personnel reductions via attrition (69%), cross-training (84%), skill mix reductions (60%), reassignment of support services (60%), redistribution of patients on nursing units (42%); reduction of management positions (54% by layoffs, 70% by attrition)	57% of hospitals had restructured; 12 magnet hospitals showed more declines than improvements in the nursing practice environment between 1986 and 1998; RN staffing and mortality were negatively correlated ($r = -0.49$, $P = 0.02$ based on 1997 data from 22 magnet hospitals; $r = -0.18$, $P = 0.02$ for 314 hospitals).
Berlowitz 2001[49]	Outpatient care	Retrospective cohort	Design: Level 4, Patient outcomes: risk-adjusted development of stage 3 or 4 pressure ulcers (Level 1)	Department of Veterans Affairs (VA) long-term care units at about 150 VA medical centers nationwide between 1990 and 1997; 274,919 observations of 103,499 VA residents who were without a pressure ulcer (PU) at an index assessment: 97% were men, average age was 71 years	Reorganization beginning in 1995 to shift from a hospital-based, specialty-focused system to one based on primary care delivered in outpatient settings	Before the change (1990–1994), risk-adjusted rates of PUs declined by 27%. Rates began increasing in 1997. By 1997 rates were similar to those in 1990. The proportion of new PUs that were severe increased significantly from 1995 to 1997 ($P = 0.01$, average 45%). 11 patient characteristics were significantly associated with PU development (e.g., mobility, dependency on transferring, toileting; $P < 0.001$).

Source	Safety Issue Related to Clinical Practice	Design Type	Study Design, Study Outcome Measure(s)	Study Setting & Study Population	Study Intervention	Key Finding(s)
Bryan 1998[18]	Patient-centered care	Cross-sectional, Same variables measured at 4 points in time using different patients (preimplement-ation, 6, 12, and 18 months after)	Design: Level 3, Patient outcomes: mortality, falls, medication errors, nosocomial infections, IV-related complications (Level 1), patient satisfaction	Four medical-surgical units in one Pennsylvania hospital: patients at baseline = 2,700 6 months = 2,500 12 months = 2,756 18 months = 2,672	Hospital redesign using patient-centered concepts—facility changes (e.g., alter location and number of work stations and supply areas), enhanced information systems (e.g., redesigned patient call system), total redesign of work processes (e.g., redesigned staff roles to use multiskilled personnel)	Mortality ratios declined from baseline, although an increase was evident in the last year of reported data; rate of occurrence per 100 patients for falls, medication errors, nosocomial infections, and IV-related complications improved or remained unchanged since restructuring (0.4-3/100 patients before and 0.2-2/100 after); patient satisfaction improved on 3 of the 4 units, but the pattern of change differed among all units.
Cummings 2005[20]	Leadership	Cross-sectional	Design: Level 3, 15 nursing outcomes: e.g., emotional health; physician-nurse teamwork; nurse workgroup collaboration; satisfaction with time to spend with patients, supervision, financial rewards, one's job; perceived quality of care as measured by unmet patient needs (Level 3)	Acute care hospitals in Alberta, Canada; 6,526 registered nurses (53% response rate)	Leadership styles: resonant (visionary, coaching, affiliative, democratic), dissonant (pace setting, commanding), mixed.	Hospital restructuring led to reported increases in unmet patient needs among all nurses surveyed. Resonant leadership lessened the intensity of the impact of restructuring on unmet care needs, emotional exhaustion, emotional health, and workgroup collaboration. Dissonant leadership intensified the effects of restructuring. Other causal relationships were discovered among nursing outcome variables that were mitigated by resonant leadership.

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Cummings 2003[21]	Effects on nurses who remained employed while others lost their jobs	Systematic literature review	Design: Level 1, effects of restructuring on nurses remaining employed in hospitals (Level 3)	Published research—84 papers were screened for inclusion criteria: 22 papers were included in the review (18 of 24 quantitative papers and 4 of 9 qualitative papers)	Hospital restructuring effects on nurses (RNs and LPNs)	Decreased job satisfaction complicated recruiting and retaining nursing staff; increased emotional exhaustion and work absences; perceived and actual increased workload; perceived increase in patient acuity; impaired ability to communicate important patient information; loss of work group cohesion.
Keller 2004[51]	Hospital bed closures	Cross-sectional	Design: Level 4; outcomes: rate of home care, service intensity	Kingston, Ontario, Canada; closure of 134 acute care beds in 2 tertiary teaching hospitals in 1997; hospital patients ages 45 and older, discharged to a home setting between 1996 and 2000, covered by the provincial health insurance plan and admitted to the local Community Care Access Center within 5 days before or after hospital discharge ($n =$ 1,651)	Delivery of home care by registered nurses (RNs) and registered practical nurses (RPNs)	Patients needed continued care after discharge. Age-gender standardized rates for home care showed a 10% increase between 1996 and 1997, with people 13% more likely to receive home care in 1997 (OR 1.13, 95% CI 1.05–1.22). Between 1996 and 2000, there was a 4% net increase in the age-gender standardized rate of admission to home care services. Service intensity and volume were measured at weeks 1, 2 & 1 month— total visits and visits/patient increased from 1996 to 1999; the total volume of nurse visits was highest in 2000; the intensity of nursing care eased in the second week after discharge.

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Laschinger 2004[32]	Nurse managers' health	Cross-sectional	Design: Level 3, outcomes: empowerment, burnout (emotional exhaustion [EE]), job satisfaction, mental and physical health (Level 3)	Acute care hospitals in Ontario, Canada; random sample of 500 nurse managers; 286 usable surveys were returned (62%); first-line managers (n = 202), 95% female, average age 48, average years nursing experience 25, average years managerial experience 10, 42%, were baccalaureate prepared; middle managers (n = 84), 96% female, average age 49, average years nursing experience 27, average years managerial experience 14, 43%, were master's prepared	Restructuring	First-line and middle nurse managers perceived their work environments as being only modestly empowering but reported high levels of psychological empowerment. EE was high (reflecting burnout), energy levels were low, physical and depressive symptoms were infrequent. Predictive models showed structural empowerment was a significant predictor of EE in both groups of managers. Managers are at risk of developing EE, the core component of burnout, if they do not have needed information, resources, and support to perform their roles.

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Rubenstein 1996[50]	Outpatient care	Cross-sectional with data collected at 3 points in time—1989, before implementation; 1992, early in implementation; and 1993 after implementation	Design: Level 3, outcomes: mortality (Level 1), continuity, preventive care, access, workload (Level 3)	A VA medical center in California; data for practice-based comparisons came from 1,262 veterans in 1992 and 1,373 in 1993 (697 were from a new cross-sectional sample and 676 were from the original cohort); data for visit-based comparisons came from 1,407 veterans in 1992 and 643 in 1993 (92.3% of the new clinic cross-section). Patient survey responses were linked to computerized utilization and mortality data.	Implementation of the Primary Ambulatory Care and Education (PACE) program, a medical-center-wide interdisciplinary matrix management system and training program; put in place in 1990–1991.	There were no statistical differences in mortality between patients who saw a physician for symptoms vs. patients who did not. From 1992 to 1993, improvements were found for continuity of care, preventive care related to smoking and exercise ($P < 0.05$), and detection of depression ($P < 0.001$). Hypertensive patients receiving antihyperten-sives increased as well (8.6%, $P < 0.01$). Access diminished—21% of patients with serious symptoms did not see a physician in 1992, rising to 42% in 1993. Time to talk with patients and explain health problems and medications improved ($P < 0.05$).

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Sovie 2001[43]	Nursing structure and processes	Cross-sectional	Design: Level 3, outcomes: *structure* (full-time equivalents for each type of nursing staff; skill mix, hours worked per patient day [HPPD] for all staff); *process* (management practices and organizational processes, e.g., autonomy, decisionmaking); *outcomes* (annual rates for nosocomial pressure ulcers [NPUs], urinary tract infections [UTIs], falls, (Level 1); patient satisfaction with pain management, education, attention to needs, nursing and the hospital, preparation for discharge (Level 3)	29 university teaching hospitals with > 300 acute operating beds in 8 of 9 U.S. census regions; chief nurse executives (CNEs) at each hospital (all were women with graduate degrees, 15 had doctorates), patients and nursing staff (registered nurses [RNs], licensed practical nurses [LPNs], unlicensed assistive personnel [UAP]) from a medical unit and a surgical unit at each hospital (RN participants: n = 1,687 in 1997, 1,256 in 1998; 92–93% female, 57–58% married, 53% BSN degrees, mean age 37, mean years in nursing 11)	Restructuring had been in progress in 50% of the hospitals for over 4 years prior to data collection. The goal of restructuring was to achieve reductions in operating costs.	Less management support was available to patient care staff: expanded CNE responsibilities (97%), nursing departments downsized (82%), nurse manager positions reduced in 91% of the hospitals and span of control increased to more than one nursing unit. There were fewer RNs and more UAPs; outcomes were affected by RN HPPD and HPPD by all staff; increased RN HPPD were associated with lower falls and higher patient satisfaction with pain management; increased HPPD by all staff were associated with lower UTI rates; no single staffing pattern resulted in best value; outcomes differences for medical and surgical units reflected the importance of unit-level evaluations.
Walston 2000[46]	Changed work processes and design	Cross-sectional	Design: Level 3, outcomes: changes in hospital cost per adjusted patient day relative to the hospital's market area (controlling for bed size and other factors) (Level 3)	All U.S. general medical/ surgical hospitals in urban areas with > 100 beds (N = 2,306); CEOs surveyed November 1996 through July 1997	Reengineering (60% rate of adoption in sample)	Negative influence on a hospital's competitive position (hospital costs were increased relative to competitors); use of integrative strategies (e.g., project teams, deep CEO involvement) may moderate the negative effects of reengineering.

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Woodward 1999[48]		Cross-sectional at 3 points in time over 2 years	Design: Level 3, outcomes: work environment, emotional distress, personal resources, perceptions of patient care and the hospital as an employer (Level 3)	One large teaching hospital in Ontario; 900 randomly sampled employees, 881 of whom were eligible, 730 of whom were employed 2 years later, 47% responded in all time periods. Respondents to all 3 surveys included 220 health care professionals, 40 service/technical staff, 66 secretarial personnel, 20 business staff.	Re-engineering	Statistically significant changes ($P \leq 0.001$) were found for job demands (increased), coworker and supervisor support (decreased), less role clarity and teamwork, and more job insecurity. Psychological distress as measured by anxiety, depression, and emotional exhaustion showed an overall increase ($P < 0.001$). Perceptions of care quality and the hospital's work environment also diminished ($P \leq 0.001$).