

# Chapter 20. Leadership

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## Background

Reports from the Institute of Medicine (IOM) have emphasized that leadership is essential to achieving goals related to quality care<sup>1</sup> and patient safety.<sup>2</sup> Leadership is expected from individuals at all levels of an organization, from the executive suite to those working directly with patients. Leadership is also expected regardless of where care is delivered—inpatient units, clinics, settings for ambulatory procedures, long-term care facilities, or in the home.

Because of the breadth and complexity of the literature on leadership, the authors narrowed the focus to leadership at two distinct levels of health care organizations. First, the literature on executive leadership was reviewed, with a particular focus on the relationship between the chief executive officer (CEO) and chief nurse officer (CNO), to examine leadership by individuals responsible for setting the organization's vision and direction related to quality of care and patient safety. Second, an exploration of the literature related to the leadership exerted by nurses and physicians as co-leaders of the patient care areas—that is, the type of leadership provided by co-leaders who are responsible for actualizing the vision and creating the local environment in which care is provided—was conducted.

A search of the relevant literature yielded little useful information on either of these leadership topics. Studies relating to the CNO or the individual in an equivalent position focused on hospital directors,<sup>3</sup> nursing home administrators,<sup>4</sup> CEOs and boards of directors,<sup>5</sup> and CNOs,<sup>6-29</sup> with no empirical evidence regarding the CEO-CNO relationship. Thus, the focus on the CNO shifted to reporting findings regarding the CNO's leadership style and its impact on the organization.

On the second level, that of nurse-physician co-leadership, there was a similar void in the literature. Thus, this chapter describes the very few studies that have examined nurse-physician co-leadership and reports findings from interventional studies on the broader context of nurse-physician collaboration and its impact on quality and safety of patient care. Collaboration is certainly a precursor to nurse-physician co-leadership.

## Research Evidence

### Executive Level

Only two investigations were found that linked CNO leadership to quality care and patient safety. A case study was done to examine the influence of the CNO in revitalizing the flagship hospital of a large, integrated health system.<sup>7</sup> Features of patient safety were among the outcomes evaluated at baseline, 18 months, and 36 months. Patient falls and nosocomial bloodstream infections declined over time from baseline; patient satisfaction with nursing care improved. The other investigation examined the relationship of both leadership and communication to quality care in 15 nursing homes from four States.<sup>4</sup> The nursing home administrators were invited to participate, but the findings did not reflect how many actually responded. Nonetheless, clinical staff (n = 656) provided important insights regarding what

promoted the best care possible. The top three responses regarding what facilitated good care and what interfered with providing good care were communication, staffing, and leadership. The study findings were not specific, however, as to whether the participants were addressing executive leadership.

Studies involving CNOs frequently examined leadership styles and behaviors. Transformational leadership captured the interest of several investigators.<sup>11–13, 21, 23, 24</sup> Although these studies were often framed to indicate a preference for a transformational style, the findings reflected that leadership is complex and multidimensional. CNOs typically used combinations of transformational, transactional, and laissez-faire leadership.<sup>13, 21, 23</sup> Moreover, four homogeneous leadership groupings were found among 84 CNOs based on combinations of high and low transformational and transactional behaviors.<sup>11</sup>

The need for a comprehensive assessment of leadership was put into perspective in a study involving a random sample of 477 CNOs who were members of the American Organization of Nurse Executives (AONE).<sup>21</sup> Both transformational and transactional leadership had a negative relationship with alienative (unfavorable) organizational commitment among registered nurses (RNs). However, transactional leadership demonstrated a stronger ( $r = -0.31$ ;  $P < 0.01$ ) association with alienative organizational commitment than transformational leadership ( $r = -0.24$ ;  $P < 0.05$ ).

Other styles of leadership were also assessed; however these findings could not be explicitly linked to CNOs. Rather, the investigators considered leadership from nurse administrators, allowing the possibility that participants may have reflected on leadership from nurse managers. Nevertheless, authoritarian leadership interfered with work empowerment.<sup>20</sup> Conversely, connective leadership—which was largely composed of the elements of transformational leadership—was predictive of empowerment.<sup>18</sup> A study involving 6,526 RNs from Canada illustrated the need to examine the full repertoire of leadership styles.<sup>30</sup> A heretofore unrecognized leadership style—resonant leadership—lessened the impact of restructuring.

Another approach to assessing CNO leadership was to compare how CNOs perceived their leadership with how various other individuals perceived the CNO leadership style. These studies, involving CNO direct reports,<sup>11</sup> the individuals to whom CNOs reported (usually the chief operating officer, COO),<sup>13</sup> nurse managers (NMs),<sup>15, 19, 21</sup> staff nurses,<sup>21</sup> and influential colleagues,<sup>14, 17</sup> further verified the complexities of leadership. For example, although there were discrepancies between CNOs and their direct reports regarding how often CNOs used transformational leadership, the direct reports were more satisfied with the CNO leadership style than the CNOs expected.<sup>13</sup> Based on data from the same study, however, no differences in ratings of work group effectiveness were found, among the three groups (CNOs, direct reports, CNO supervisors).

NMs ( $n = 87$ ) who agreed with their CNOs' ( $n = 22$ ) leadership style were more likely to be satisfied with their jobs.<sup>15</sup> In another study conducted in a 700-bed acute care setting during an organizational transition, a rating scale and interviews were used to identify the executive behaviors that were most important to NMs.<sup>19</sup> Although it was not clear whether CNOs per se were considered, communication and high visibility on work units were the top 2 of the 10 most desired behaviors.

A study of nurse leadership in four hospitals—two with Magnet status and two without Magnet status—found that leadership affected staff nurse job satisfaction.<sup>25</sup> Based on survey responses from 305 staff nurses and interviews with 16 nurse leaders, some of whom were CNOs, the investigator concluded that staff nurses were more satisfied when nurse leaders were

visible and responsive, when they supported autonomous decisionmaking, and when there was adequate staffing.

Another group of studies examined skills essential to being a successful CNO, especially given how the role is changing.<sup>8, 10, 17, 27, 28</sup> For example, in a study conducted in one U.S. city involving CNOs and female leaders in other fields, six categories of essential leadership skills were identified: (a) personal integrity, (b) strategic vision/action orientation, (c) team building/communication, (d) management and technical competence, (e) people skills, and (f) personal survival skills.<sup>10</sup> A Delphi study conducted in 22 European countries identified 16 relevant CNO qualities.<sup>17</sup> Communication ranked first, followed by teamwork, leadership, strategic thinking, political astuteness, professional credibility, integrity, personal qualities, innovation, decisionmaking, promotion of nursing, research skills, physical characteristics, information handling, good management, and conflict resolution. The rankings from a European study differed from rankings derived from a U.S. study in which clinical knowledge ranked first of 14 items, communication ranked eighth, and teamwork was not in the rankings.<sup>8</sup> Attributes of successful nurse leadership in acute care settings were compared between 16 leaders at Magnet (n = 7) and non-Magnet hospitals (n = 9).<sup>27, 28</sup>

Additionally, researchers have found that organizational characteristics such as culture and size may alter the expression of leadership.<sup>13, 27</sup> Gender is another factor that has been assessed regarding CNO leadership. In one study, gender was deemed irrelevant because of the effective way in which the hospital leadership teams interacted.<sup>27</sup>

A final set of studies concerning CNOs provided evidence using qualitative methods.<sup>6, 9, 16, 24, 26, 29</sup> Some of these studies were conducted to delineate key executive leadership characteristics.<sup>24, 26</sup> For example, based on interviews with 10 CNOs, key characteristics included knowing how to use power; being visible; having a vision for the organization; motivating staff; empowering staff; and being open, honest, and personable.<sup>24</sup> Similarly, 16 nurse leaders—some of whom were CNOs—from four acute care hospitals were interviewed to identify effective leadership traits.<sup>26</sup> The categories that emerged were (a) core principles and value system guiding leadership (e.g., leading to serve, striving for excellence, a passion for nursing); (b) use of quantitative data to influence decisionmaking; and (c) collaborative teamwork among patient care staff to provide excellent care, and among management to support one another and staff. Findings from other qualitative investigations included a serendipitous finding about obstacles CNOs face in all aspects of their work;<sup>9</sup> determining CNO leadership behaviors across three hierarchical domains of leadership: strategic, organizational (administrative management), and production (creating goods and services);<sup>16</sup> how the merger of business (managed care) and medicine widened the gender gap in health care leadership;<sup>6</sup> and thought processes used by expert CNOs in making decisions.<sup>29</sup>

## Nurse-Physician Co-Leaders

While there is a growing body of research described later in this chapter on the impact of collaboration between nurses and physicians who are caregivers,<sup>31-45</sup> there is a notable absence of research on the impact of a collaborative relationship between the nurse and physician co-leaders of patient care units. Presented in this section is a brief history of the concept of partnered leadership and a description of the one study found on this specific type of nurse-physician relationship.

The importance of a focus on collaboration and partnered leadership between nurse and physician is not a new concept, but rather one that has been in the literature for more than 25

years. In 1981, the National Commission on Nursing urged trustees and administrators to “promote and support complementary practice between nurses and physicians” and to “examine organizational structure to ensure that nurse administrators are part of the policymaking bodies of the institution and have authority to collaborate on an equal footing with the medical leaders in the institution”<sup>46</sup> (p. 62). Similarly, the Joint Commission (formerly the Joint Commission on Accreditation of Healthcare Organizations, JCAHO) required that activities of critical care units be guided by a multidisciplinary approach, including nursing and medical input.<sup>47</sup> Shortly thereafter, the American Association of Critical Care Nurses and the Society of Critical Care Medicine jointly developed a position statement outlining 10 principles for optimizing resources in critical care units. While all of the principles reflect a commitment to medical and nursing co-leaders, the following two are particularly relevant<sup>48</sup> (p. 43).

- #1—Responsibility and accountability for effective functioning of a critical care unit must be vested in physician and nurse directors who are on an equal decisionmaking level.
- #10—Close collaboration between the directors is essential for successful management.

More recently, Gilmore<sup>49</sup> has advanced the concept of *productive pairs*. He noted that as organizations become increasingly complex with rapid change, leaders are less able to possess all of the knowledge and expertise needed. Thus, a model of leadership that is based on a partnership between two individuals who share common goals and come from different, yet complementary, disciplines could be very effective.

Productive pairs possess several characteristics: separate, yet complementary, bodies of knowledge; understanding and valuing each other’s areas of expertise; enough time or history together to explore the interdependencies; trust of one another that enables direct, frank exploration of issues; a commitment to the partnership and avoidance of efforts at triangulation; and a shared passion for a common goal or vision.

One study that specifically examined how physician leaders and nurse administrators worked together was by Tjosvold and MacPherson.<sup>50</sup> Physician and nursing administrator pairs were interviewed on how they worked together in managing areas within the hospital. Incidents they used to describe their relationship were coded as cooperative, competitive, or independent, and then related to outcomes.

Incidents in which goals were cooperative were ones in which physicians and nurse administrators discussed their issues constructively, had positive effect, strengthened their relationship, made progress on the task, promoted the organization’s effectiveness, developed confidence in future work, and fostered quality care. Incidents in which goals were competitive were negatively related to productive interaction and outcomes. When the partners felt competitive, they were unable to exchange ideas openly, initiatives did not progress, and the relationship and quality of care were compromised. Constructive controversy (open-minded discussion, occurring within a strong cooperative context, or various perspectives that allow disagreement and exploration in a respectful manner) enabled the pairs to discuss their views productively and resulted in constructive outcomes. On the other hand, when constructive controversy occurred in a competitive context, problems ensued, such as resistance, a close-minded discussion of ideas, and an impaired working relationship.

## Nurse-Physician Collaboration

As a backdrop for considering collaboration between nurse and physician leaders of the team, we examined the research on collaborative relationships between nurses and physicians.

Collaboration is the “process of joint decision making among independent parties involving joint ownership of decisions and collective responsibility for outcomes. The essence of collaboration involves working across professional boundaries”<sup>31</sup> (p. 186). Assumptions have been advanced that greater collaboration between nurses and physicians results in improved quality of patient care.

One of the first, and most often cited, studies on collaboration was conducted by Knaus, Draper, Wagner, and Zimmerman in 1986.<sup>32</sup> These researchers analyzed patient outcomes in 13 intensive care units (ICUs) and found a significant relationship between the presence of excellent interaction and coordination of care among nurses and physicians and improved patient outcomes. In subsequent work, Shortell, Zimmerman, and Rousseau<sup>38</sup> looked at communication and coordination in 42 ICUs, but they were unable to differentiate ICUs according to risk-adjusted survival. However, these researchers noted that communication and coordination helped decrease length of stay.

Baggs and others<sup>34, 35</sup> investigated the perceptions of physician-nurse collaboration and either negative outcomes (e.g., death or readmission to the ICU) or the transfer of patients from the ICU to an area of less intensive care. In the first study of one ICU,<sup>34</sup> these researchers found that the more collaboration nurses reported, the lower the risk of a negative patient outcome. In the second study in three different types of ICUs,<sup>35</sup> reports of collaboration by nurses in the medical ICU correlated significantly with patient outcomes: When the nurse reported full collaboration, the patient’s risk of negative outcome was 3 percent; when the nurse reported no collaboration, the patient’s risk increased to almost 14 percent. These findings were not observed in the surgical ICU or the community hospital ICU. Interestingly, in both of the studies, the reports of collaboration by attending physicians and residents were not associated with patient outcomes in any site. Differences in perceptions about collaboration have been found by other researchers as well, with physicians consistently perceiving higher levels of collaboration than nurses.<sup>33, 40, 43</sup> A study by Hojat and colleagues<sup>39</sup> in Mexico, however, found the opposite.

## Evidence-Based Practice Implications

### Executive Level

It is very difficult to link leadership to patient safety because the evidence pool is quite limited. Across studies of CNO leadership, weak designs prevail and the specific topics studied are very diffuse. As a result, it is difficult to make statements to guide practice.

A modest body of evidence is accruing about leadership styles. These studies illustrate that multiple styles of leadership may be operationalized concurrently. Evidence related to transformational leadership suggests that researchers need to consider multiple types of leadership and how the types work together, helping to limit bias created by studying only transformational leadership—or advocating for transformational leadership as a superior style. The evidence simply does not support that view.

## **Nurse-Physician Collaboration**

On behalf of the Cochrane Collaboration, Zwarenstein and Bryant<sup>51</sup> completed an international review on collaboration and found several hundred studies on the topic. After examining the abstracts, these colleagues reviewed the full text of 31 studies and found three studies that were “methodologically adequate and evaluated relevant interventions”<sup>51</sup> (p. 4), although one study eventually had to be excluded because it was difficult to sort out the impact of combined interventions.<sup>52</sup> The first retained study by Curley and colleagues<sup>53</sup> used a randomized, controlled method to examine the impact of interdisciplinary rounds on aspects of inpatient care. These researchers found a shorter length of stay (5.46 vs. 6.06 days) and lower total charges (\$6,681 vs. \$8,090) for patients receiving care from the interdisciplinary team.

The second retained study at a Thai academic hospital<sup>54</sup> compared average lengths of stay for females in a control ward with those for females in a second ward in which frequent rounding and weekly team case conferences occurred. There were no significant differences found, although patients in the interventional ward had shorter lengths of stay, when patients who died while in the hospital were excluded. These studies are reported in Evidence Table 2.

The inclusion criteria for the Cochrane Collaboration report were very restrictive and the results do not provide health care leadership with enough relevant information to guide quality improvement projects. However, a recent critical review<sup>55</sup> was completed that incorporated a wider range of methodological designs to help illuminate findings from experimental research on the impact of nurse and physician collaboration on quality and safety of patient care.

The review was limited to outcome-based experimental studies completed in the United States that focused on the acute care setting and nurse-physician collaboration. Seventeen studies met the inclusion criteria,<sup>31, 37, 53, 56–69</sup> and the findings from this review demonstrated that outcomes could be grouped into three categories: professional outcomes, organizational outcomes, and patient outcomes.

Professional outcomes were measured in several different ways, but the most frequent evaluation was in communication skills. Other areas measured were teamwork, leadership, job satisfaction, and collaboration. Organizational outcomes were very straightforward and consisted of only three major types: length of stay (LOS), readmission rates, and hospital costs. Eight of the studies that were reviewed focused on patient outcomes. Patient care outcomes ranged from anxiety, depression, and pain to functional status, length of time on a ventilator, and diabetes management. Usually the data collected were from medical records and interviews with patients or their proxies and could be considered reasonably reliable.

The types of interventions used to improve collaboration had four basic threads: interdisciplinary rounding, development of protocols, staff education of patient care guidelines, and easier access to information at the patient’s bedside. These threads are closely related to the attributes of collaboration: people working together, cooperation, sharing responsibility in decisionmaking, communication, and coordination of care.

The studies that surveyed health care providers’ perceptions used a little broader spectrum of interventions. Similarities were in the use of patient rounds, patient care guidelines, and increased access to patient information. But these studies employed other interventions that included such things as establishing contacts with key stakeholders to discuss roles and responsibilities, appointing more physician helpers (NPs), appointing medical directors, providing classes on the processes of communication and teamwork, and restructuring of the organization to decentralize professionals. One study,<sup>61</sup> which identified nine significant

findings, employed a high-quality, randomized controlled design that used five interventions to achieve its results: (1) daily review by medical director of medications and procedures; (2) daily rounds by multidisciplinary teams; (3) daily assessments by nurses; (4) protocols to improve patients' self-care; and (5) early, ongoing emphasis on returning home. The design and interventions of this complex study were well thought out, and the study subsequently demonstrated significantly improved patient outcomes in very elderly (older than 70 years), frail patients, as well as improvement in organizational outcomes. Details of the 17 studies are in Evidence Tables 2 and 3.

It is apparent that there is a dearth of methodologically sound studies on nurse-physician collaboration. While nurses and physicians universally acknowledge the importance of collaboration, we actually know very little about what it is, how it works, and whether it makes a difference. Furthermore, we have some evidence to suggest that nurses and physicians define collaboration differently and use different criteria to assess whether it's present.<sup>33, 40</sup> To a large extent, this is because collaboration is part of a complex set of related concepts, often defined and operationalized very differently, e.g., as teamwork,<sup>36, 70, 71</sup> collegiality,<sup>45, 72</sup> communication,<sup>73-75</sup> trust,<sup>31, 76</sup> and coordination.<sup>32, 38</sup>

Additional challenges to establishing a strong evidence base include the following:

- Current studies focused on only one of several possible interconnecting factors. Without adequate theoretical frameworks or sophisticated methodology, it is difficult to sort out the contributions of individual factors in a complex situation.
- Studies typically focused on interventions within one or a few patient care areas, and usually within one institution.
- Outcomes measured tended to be objective and easily quantifiable, such as length of stay,<sup>53</sup> cost,<sup>53</sup> mortality,<sup>32, 34, 35, 38, 57</sup> or readmission rates,<sup>34, 35</sup> which are certainly important. However, we also need more studies on some of the more qualitative outcomes, such as patient satisfaction and morbidity, staff morale and retention, and patient safety.

Findings indicated only one study that specifically targets the physician and nurse as co-leaders,<sup>50</sup> and this was a correlational study in British Columbia. A second study, by Boyle and Kochinda,<sup>74</sup> implemented a collaborative communication intervention to ICU nursing and physician leaders, along with several other identified leaders such as the clinical nurse specialist, in two diverse ICUs, using a pretest–post-test, repeated measures design. The intervention included a series of educational and experiential modules, yielding improved communication skills, leader satisfaction, and perceived problem-solving ability. Though this study included nursing and physician leaders, several other individuals were included in the intervention and did not target or emphasize the special role of the clinical co-leaders.

Why are there so few studies examining the relationships between and impact of co-leaders in health care, given the extensive emphasis on leadership in health care today? Dougherty and Larson<sup>77</sup> noted that most research done on collaboration was conducted by nurses, and thus, the idea of examining aspects of a partnership wasn't equally valued. Fagin<sup>78</sup> noted that physicians are not interested in interprofessional relationships in general, and that health professions' curricula do not include sufficient content in this area, although thoughts are changing as the result of a number of national initiatives to promote interprofessional education and common competencies.<sup>79-82</sup> Two other factors that contribute to this gap are that (1) the role of medical director as co-leader of a clinical area is not a widespread phenomenon and, if in place, is usually seen in ICUs, emergency rooms, and other specialty areas; and (2) funding by the National

Institutes of Health and other major funding agencies follows the biomedical model of health care research.

## **What We Do Not Know—Research Implications**

### **Executive Level**

Although there is a strong belief that executive leadership is essential to underpin patient safety, it is difficult to support that idea from an empirical base. The strongest statement that can be made based on empirical studies is that it is unwise to view transformational leadership as a preferred style, particularly when this style is assessed independent of other leadership styles and organizational variables. We actually know very little about leadership—what works, what does not, and leadership style impact on patients, staff, and the organization. Ironically, although leadership is a topic of tremendous interest, little empirical evidence exists.

### **Nurse-Physician Collaboration**

While the impact of collaboration between nurses and physicians has been studied, we have scant strong, empirical evidence that collaboration makes a difference. What is needed are consistent definitions of the concept, use of tools with appropriate psychometric properties to measure the concepts, interventional studies, and sampling from more than one or a few organizations.

There is much work to be done, and there are a number of helpful resources for getting started. The recent work of Gene Nelson, Paul Batalden, and their colleagues<sup>83-85</sup> at Dartmouth and elsewhere on clinical microsystems provides a framework for examining the role of leadership in the patient care area. Ingersoll and Schmitt<sup>86</sup> wrote a comprehensive review of the literature on work groups and patient safety that highlights teamwork, collaboration, communication, and other relevant concepts. Dougherty and Larson<sup>77</sup> recently reviewed the scope, psychometrics, and use of five instruments that have been used to measure nurse-physician collaboration; while the instruments differ significantly from each other, the authors concluded that they offer a good starting place for aiding future research.

A final comment and return to an original point: In addition to research needed on nurse-physician collaboration, significant attention must be paid to examining the experience and impact of nurses and physicians functioning as co-leaders of clinical areas. What are the factors that enhance their ability to model collaboration and co-create healthy work environments that benefit patients, families, and all members of the health care team? What are the barriers? What are individual, institutional, and societal strategies that can be implemented to a healing environment for patients, families, and all caregivers?



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**Evidence Table 1. Findings on Impact of CNO Leadership Style**

Source	Safety Issue Related to Clinical Practice	DesignType	Study Design, Outcome Measure(s)	Study Setting & Study Population	Study Intervention	Key Finding(s)
Dunham-Taylor 2000 <sup>13</sup>	Leadership	Cross-sectional (4)	Design: Level 3. Outcomes: CNO leadership style, work group effectiveness.	National study from all States; 396 CNOs, at least 3 direct reports for each CNO (N = 1,115), CNO's boss (N = 360); most CNOs were married (77%) females ((93%) in their 40s (54%) with a master's degree (61%). On average, they had 24 years experience in nursing and 9 years in executive positions. Direct reports and boss characteristics were not described except to note that most bosses were COOs.	Comparing scores on leadership styles, workgroup effectiveness.	There was a significant difference in how CNOs rated themselves and the ratings from their direct reports for transformational, transactional, and laissez-faire leadership. No statistically significant differences were found among CNOs, their direct reports, and CNO bosses in regard to work group effectiveness. Staff were more satisfied with the CNO leadership style than the CNO expected. Organizational characteristics played a role with more transformational CNOs in organizations that were participative.

Source	Safety Issue Related to Clinical Practice	DesignType	Study Design, Outcome Measure(s)	Study Setting & Study Population	Study Intervention	Key Finding(s)
Leach 2005 <sup>21</sup>	Leadership	Cross-sectional (4)	Design: Level 3. Outcomes: Organizational commitment which was assessed according to 3 types-moral (normative, internalized identification), calculative (remunerative or compliance), and alienative (negative resistance).	A national random sample of CNO AONE members working in hospitals and a convenience sample of NM (n = 148) who reported to the CNO and 651 staff nurses who reported to a participating NM. CNOs from 35 States returned 102 usable surveys. All but one CNO were women. They had more than 15 years experience in nursing, and 70% had more than 15 years experience in management. Almost 80% had master's degrees. NMs were mostly women (95%). Most had been in nursing for more than 15 years (75%), most had more than 15 years experience in management, and 40% held a master's degree or higher. The staff nurses were mostly women (64%), and most had 11 or more years experience in nursing (62%). Almost 40% had a BSN.	Leadership and nurses' organizational commitment.	CNOs and NMs had a leadership profile that illustrated elements of both transformational and transactional leadership. Both styles of leadership showed a negative and statistically significant relationship with alienative organizational commitment. Both leadership styles were positively and statistically significantly for CNOs and NMs. No relationship was found between NM and staff nurse organizational commitment.

**Evidence Table 2. Cochrane Collaborative Results: Randomized Controlled Trial Focused on Increasing Collaboration between Nurses and Physicians**

Source	Safety Issue Related to Clinical Practice	Design Type	Study Design, Study Outcome Measure(s)	Study Setting & Study Population	Study Intervention	Key Finding(s)
Curley 1998 <sup>53</sup>	Collaboration	Randomized controlled trial—6 month prospective trial, with patients randomly admitted to different doctor groups (Firms).	Variables measured were length of stay (LOS), hospital charges, provider satisfaction, ancillary service efficiency, readmission rates, and quality of patient care. Using hospital billing system, medical records, and surveys.	Medical unit inpatients at large county hospital affiliated with university; used a 30-bed nursing unit; each firm had 25 attending physicians and 25–30 residents. 1,102- total number of patients: 535 in control group 567 in intervention group	Interdisciplinary rounds—MDs, RN (patient care coordinator), pharmacist, nutritionist, and social worker daily rounding; orders written during rounds; chart taken with MD on rounds.	Significant increase in provider satisfaction and perceived collaboration in the areas of understanding patient's plan of care, communication, and teamwork. Some decreases in LOS, readmission rates, and hospital costs.

**Evidence Table 3. Outcome-Based, Experimental Studies Focused on Increasing Collaboration between Nurses and Physicians**

Source	Safety Issue Related to Clinical Practice	Design Type	Study Design, Study Outcome Measure(s)	Study Setting & Study Population	Study Intervention	Key Finding(s)
Inouye 1993 <sup>56</sup>	Nurse-physician collaboration	Prospective cohort study with stratified and matched cohort analysis; not randomized.	Variables measured were functional decline—overall; functional decline—matched cohort analysis; using interviews; self reported activities of daily living (ADLs); mini-mental exam; confusion assessment; physical exam; and medical records for risk assessment.	Medicine units. Huge differences in baseline data. Required matched cohorts to further analyze data. 216 total 85 intervention 43 RN/MD group 42 RNonly group 131 control 66 matched cohorts	Identification and surveillance of frail older people. Twice weekly rounds of the geriatric care team. Nursing-centered educational program.	Improvement in functional decline significant only after using matched-cohort analysis.
Gallager 1998 <sup>57</sup>	Nurse-physician collaboration	Retrospective and prospective study, convenience sample, repeated measures done quarterly; for 11-month period.	Variables measured were frequency of blood glucose monitoring; nutrition assessment; insulin management; change to glucose intolerance enteral formula as recommended by protocol; using medical records review.	All tube-fed patients admitted to a 16-bed ICU, community hospital; 65 eligible 35 participants who met criteria.	Interdisciplinary collaboration in study design, organization, and implementation of a performance improvement initiative using the Plan/Do/Check/Act process: a group formed; critical blood glucose levels defined; interventions defined.	Improvement in BG monitoring, nutrition assessment, insulin management, and hyperglycemia control.



Source	Safety Issue Related to Clinical Practice	Design Type	Study Design, Study Outcome Measure(s)	Study Setting & Study Population	Study Intervention	Key Finding(s)
Lassen 1997 <sup>58</sup>	Nurse-physician collaboration	Design – retrospective and prospective comparisons of patient charts 1 year prior to intervention, right after intervention, and then 1 year after intervention, for a 3-month period of time during each interval.	Variables measured were quality of patient care; costs; length of stay (LOS), number of antibiotics received, and readmissions rates. Using medical records review.	350-bed tertiary hospital. All children admitted with sepsis during study period.	Protocol development for management of rule-out sepsis – Education of RNs and MDs in the nursery for 3 months.	Decrease in patient anxiety and confusion; significant decrease in cost and LOS, and mixed results in readmission rates.
Jordan-Marsh 2004 <sup>59</sup>	Nurse-physician collaboration	Pre- and post-intervention data collection, total 14 quarters; 2–8 were implementation, 9–13 were maintenance.	Variables measured were documentation of pain; evaluation of effectiveness; improved pain management measured as doses of analgesia; improved pain management measured by analgesia type. Using chart audit (10% of charts each month), pharmacy records of drugs dispensed to ward, and census.	Patients on a pediatric ward in large urban hospital. Between 715 and 840 patient days per quarter.	Multifocal approach for QI-Referral book; resident experts; flow sheet; classes, policy, and protocol; rounds weekly; interdisciplinary plans; change nurses' scope of practice to include giving morphine IV; agenda item for P&T Comm; etc.	Decreased reports of pain by patients; increased evaluation of effectiveness; and improvement of pain management.

Source	Safety Issue Related to Clinical Practice	Design Type	Study Design, Study Outcome Measure(s)	Study Setting & Study Population	Study Intervention	Key Finding(s)
Kollef 1997 <sup>60</sup>	Nurse-physician collaboration	Randomized controlled trial during a 4-month period; stratification according to ICU site.	Variables measured were duration on mechanical ventilation; need for reintubation; LOS; hospital mortality rate; and cost. Using medical records review.	In medical ICU and surgical ICU in 2 teaching hospitals; 4 units total. 377 total 179 intervention group (protocol directed) 178 control group (physician directed)	Protocol-directed weaning from mechanical ventilation developed by medical director; education of nursing and respiratory staff before implementation.	Significant decrease in duration on mechanical ventilation; decreased costs and LOS; and mixed results with readmission rates.
Landefeld, 1995 <sup>61</sup>	Nurse-physician collaboration	Randomized control trial – randomly assigned to acute care program for elderly or usual care.	17 different measures looking at ability to perform ADLs – using different time frames, controlling for risk factors; plus LOS and costs. Using interviews, medical records and Universal Bill (1982).	>70 yr, admitted to general medical unit 651 total 327 intervention group 324 control group	Daily review by medical director of meds and procedures; daily rounds by multidisciplinary team, daily assessments by nurses; protocols to improve self-care; early, ongoing emphasis on returning to home.	Numerous quality of patient care outcomes were significant; also found a decrease in cost and LOS, and a mixture of results for readmission rates.

Source	Safety Issue Related to Clinical Practice	Design Type	Study Design, Study Outcome Measure(s)	Study Setting & Study Population	Study Intervention	Key Finding(s)
Henneman. 2001 <sup>37</sup>	Nurse-physician collaboration	Pre- and post-quasi-experimental; compare patient outcomes 1 year before and 1 year after intervention.	Variables measured were length of time of mechanical ventilation; length of time in the ICU; cost and complications. Using Medical records; mortality rates, readmission rates to any ICU; staffing patterns, years of experience of nursing and respiratory therapy staff, and management choices.	8-bed medical ICU; no differences between control and experimental groups 207 total 77 control group 124 intervention group	Multidisciplinary rounds every morning; assessment data and progress available in medical record (both groups); assessment data and weaning progress flow sheet on board and flow sheet at patient's bedside (for intervention group only).	Significant decrease in length of time on ventilator; significant decrease in LOS; some decrease in hospital costs; and mixed results for readmission rates.
Vazirani 2005 <sup>62</sup>	Nurse-physician collaboration	Quasi-experimental; 1 control and 1 intervention unit; over a 2-year period.	Variables measured were collaboration with MDs; NPs, RNs; communication; LOS; cost and readmission rates. Using surveys of nurses (biannually); attending MD (every 2 weeks), and residents (every month).	2 acute care inpatient medical units; no crossover between units with MDs or RNs; staffing and demographics of patients and nurses same between units. House staff – 111 (58%) Attending physicians – 45 (69%) Nurses – 123 (91%)	Appointment of an NP; appointment of hospitalist medical director; institution of daily multidisciplinary rounds—lasted 15 minutes per team.	Significant increase in perceived collaboration. (RNs had better communication only with NPs; MDs had better communication with fellow MDs and NPs, and increased collaboration amongst themselves.) Some decrease in LOS and hospital costs; and mixed results for readmission rates.

Source	Safety Issue Related to Clinical Practice	Design Type	Study Design, Study Outcome Measure(s)	Study Setting & Study Population	Study Intervention	Key Finding(s)
Trey 1996 <sup>63</sup>	Nurse-physician collaboration	Descriptive, retrospective	Variable measured was clarity of roles. Using nurse manager's report.	Ambulatory care center of a large teaching hospital. Nurses, surgeons and anesthesia staff; no size given	Clarification, discussion, and resolution of ambiguous roles. Job descriptions of nurse manager and medical director were written and implemented.	Nurse manager reported that intervention helped nurses identify MD and RN responsibilities.
Dechairo-Marino 2001 <sup>64</sup>	Nurse-physician collaboration	Pre- and post-test, intervention study – convenience sample. Surveyed at baseline and 1 month prior and 3 months after completion of interventions.	Variables measured were perceived collaboration scores and satisfaction with decisionmaking. Using Bagg's Collaboration and Satisfaction about Care Decisions questionnaire (adapted version).	RNs working on 3 medical-surgical units and 2 ICUs; 87 pretest 65 post-test; approx 50% response rate; 60% attendance rate for intervention.	Activities – developed the Operating obtained endorsement; incorporated principles into unit activities; offered 4 hour, one session class re: concepts.	Significant increase in perceived level of collaboration and the nurses' satisfaction with decisionmaking process.
Boyle 2004 <sup>65</sup>	Nurse-physician collaboration	Quasi-experimental, prospective, intervention study. Intervention group – Pretest–post-test, followup immediately after intervention. Control group (unit staff) – F/U pretest and 6 months after intervention to explore penetration.	Variables measured were communication skills and leadership skills; situational stress and personal stress. Using collaboration skill simulation vignettes, ICU nurse-physician questionnaire, and ICU outcomes.	2 ICU units used; both had same leadership, staffing levels, and technology. Unit A = 4 beds with only 11 diagnoses; 9 nurses; 3 MDs. Unit B = 22 beds with 162 diagnoses; 38 nurses; 14 MDs. 10 leaders for both units.	6 modules on Interaction Process – 23.5 hours using adult learning methods; 2 4-hr sessions over 8 months. Participants also received coaching and reinforcement between sessions.	Significant improvements in communication skills and leadership skills and leadership characteristics exhibited; significant improvement in professional satisfaction in relationship to personal stress and situational stress; mixed results with all other parameters measured.

Source	Safety Issue Related to Clinical Practice	Design Type	Study Design, Study Outcome Measure(s)	Study Setting & Study Population	Study Intervention	Key Finding(s)
Wyly 1996 <sup>66</sup>	Nurse-physician collaboration	Descriptive study of quality improvement project.	Variables measured were satisfaction with workshop and staff's plan to use elements in their work. Using surveys.	600 staff nurses	2-day training workshop, creating a learning climate that facilitates participation. Focused on Interdisciplinary teams; high-risk infant and family interventions in the neonatal ICU and through transition to community.	High satisfaction with workshop and high level of intent to use elements in their work.
Foley 1997 <sup>67</sup>	Nurse-physician collaboration	Pre- and post-test; control and intervention groups; tested 2 months after intervention; convenience sample;	Variables measured were communication skills with physicians and interactions with patients. Using Nurse-Physician-Patient Interaction/Communication Survey and demographics.	Control group from 2 units, intervention group from another unit 66 total 28 intervention group 38 control group	Nurses engage in 2 different 15-minute videotaped case scenarios using standardized patients and standardized physicians, 1 week apart; rate themselves on a "Performance Assessment Checklist."	No significant results in nurses' communication skills with patients and physicians.

Source	Safety Issue Related to Clinical Practice	Design Type	Study Design, Study Outcome Measure(s)	Study Setting & Study Population	Study Intervention	Key Finding(s)
Narasimhan 2006 <sup>68</sup>	Nurse-physician collaboration	Prospective, quasi-experimental, with testing at baseline, 1 week, 6 weeks, 9 months after implementation of intervention.	Variables measured were staff's level of understanding goals for the day; communication; desire to continue to use worksheet; and belief the worksheet had a positive effect on patient outcomes. Using surveys.	16-bed medical ICU, closed unit RNs – baseline – 21 6 wk – 14 9 mo – 18 MDs – baseline – 12 6 wk – 14 9 mo – 17 Response rate not given.	Daily goals worksheet that included consents, tests, medications, sedation, analgesia catheters, consults, nutrition, mobilization, family discussions, and dispositions (not part of the Medical Record).	Increased perception of collaboration (i.e., understanding patient goals and communication process) for both RNs and MDs.
Lorenzi 1993 <sup>69</sup>	Nurse-physician collaboration	Single group pre- and post-test design, repeated measures at baseline, 3 months, and 6 months.	Variables measured were job satisfaction; level of nurse-physician collaboration; broad knowledge base of sickle-cell; and demographics variable (years of experience and present employment status). Using knowledge-based test, job satisfaction tool, and surveys.	42 eligible 18 participants 40% response rate	Education program for nurses; 10 hours of sickle-cell disease process, treatment, interventions, and relaxation techniques; Implementation of a comprehensive guideline for the care of sickle-cell patients.	Significant improvement in collaboration with MDs, and an increase in job satisfaction for RNs. Demographic variables were significant for years of experience and present employment status.

Source	Safety Issue Related to Clinical Practice	Design Type	Study Design, Study Outcome Measure(s)	Study Setting & Study Population	Study Intervention	Key Finding(s)
Liedtka 1998 <sup>31</sup>	Nurse-physician collaboration	Postintervention survey.	Variables measured were differences and similarities of nurses', physicians', and administrators' perceptions of factors correlated with successful collaboration. Using questionnaires and interviews.	Large, academic health center, 3 service lines, and 3 professions surveyed 346 eligible 124 participants 36% response rate	Organization restructure to service lines; Implementation of a new organizational structure that has nonnursing professionals report to unit managers instead of central department.	Increased perception of factors that are correlated with successful collaboration in RNs, MDs, and administrators.

