CHEST

Medical Ethics

Responsibility for Quality Improvement and Patient Safety

Hospital Board and Medical Staff Leadership Challenges

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Concern about the quality and safety of health care persists, 10 years after the 1999 Institute of Medicine report *To Err is Human*. Despite growing awareness of quality and safety risks, and significant efforts to improve, progress is difficult to measure. Hospital leaders, including boards and medical staffs, are accountable to improve care, yet they often address this duty independently. Shared responsibility for quality and patient safety improvement presents unique challenges and unprecedented opportunities for boards and medical staffs. To capitalize on the pressure to improve, both groups may benefit from a better understanding of their synergistic potential. Boards should be educated about the quality of care provided in their institutions and about the challenges of valid measurement and accurate reporting. Boards strengthen their quality oversight capacity by recruiting physicians for vacant board seats. Medical staff members strengthen their role as hospital leaders when they understand the unique duties of the governing board. A quality improvement strategy rooted in synergistic efforts by the board and the medical staff may offer the greatest potential for safer care. Such a mutually advantageous approach requires a clear appreciation of roles and responsibilities and respect for differences. In this article, we review these responsibilities, describe opportunities for boards and medical staffs to collaborate as leaders, and offer recommendations for how boards and medical staff members can address the challenges of shared responsibility for quality of care. ***CHEST 2010; 138(1):171–178***

Abbreviations: CEO = chief executive officer; CLABSI = central line-associated bloodstream infections; NFP = not-for-profit; SOX = Sarbanes Oxley

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Hospital boards have fiduciary responsibility to oversee the safety and quality of care provided in their institutions, though until this decade, boards assumed quality, rather than measured it, and provided relatively little direct attention to this duty. The two primary categories of board authority for quality and safety include decision making, which has to do with medical staff credentialing, and an oversight function.[1] Yet, most boards delegated oversight of clinical matters to their medical staffs and administrators, either formally or informally.[2] Boards typically focused their talents and energies on financial issues, including fundraising, capital expenditures, and operating margins.

For editorial comment see page 10

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This pattern changed abruptly in response to two cataclysmic forces. First, a series of corporate scandals in the for-profit world, capped by the implosion of Enron in 2001 and WorldCom in 2002, and nonprofit scandals such as the $1.3 billion bankruptcy of the Allegheny Health, Education, and Research Foundation[3] led to much greater scrutiny of corporate boards and far higher standards of accountability. As a result, the 2002 Sarbanes Oxley legislation (SOX)[4] introduced major changes to the regulation of corporate governance and public finance and called for the US Securities and Exchange Commission to "foster greater public confidence in securities research" (SOX, sec. 501). Second, the US Institute of Medicine reports on medical errors[5] and health-care quality[6] published in 1999 and 2001, respectively, led to tremendous pressure on health-care organizations, particularly hospitals, to improve the quality of care provided to their patients. In the face of reports of nearly 100,000 deaths per year from medical mistakes and failure to provide evidence-based care nearly half the time, the laissez-faire attitude of hospital boards regarding clinical care gave the sense of being asleep at the switch.[7]

These two forces—increased scrutiny of institutional leadership in general and enhanced pressure to improve quality and safety in hospitals—transformed the roles and responsibilities of hospital boards. Yet, responsibility does not equate with action. A recent study surveying a nationally representative sample of board chairs in 1,000 US hospitals found that fewer than half of the boards rated quality care as one of their top two priorities.[2] In this article, we review these responsibilities, describe the legal and political underpinnings of board governance, portray the need for increased collaboration between boards and medical staffs to meet the new mandates, provide recommendations for boards and medical staffs that will help both meet their important responsibilities related to safety and quality of care, and offer the framework for a board scorecard to monitor quality and patient safety.

The Legal and Regulatory Contexts for Boards' Activities

In not-for-profit (NFP) hospitals, the roles and responsibilities of governing boards are complex, interconnected, and critical to institutional viability and to fulfilling their community obligation.[8] NFP hospital governance boards are legally bound to the fiduciary duties of care, loyalty, and obedience.[1,9] Historically, the interpretation of those duties varied widely in accordance with local culture and reflected the flexibility of state statutes.

Wide variation still exists in the level of hospital board involvement with clinical performance, quality of care, and patient safety. Many board efforts related to quality and safety were historically more form than function.[9,10] It is important to appreciate why this was the case. First, board appointment was an honor, a recognition and reinforcement of community status. Most board members were upstanding, often well-to-do members of their local community, chosen for these attributes more than any knowledge of health care. Second, health care is a rapidly changing, technology- and knowledge-intensive industry; thus, boards need to hire and rely on managers with high levels of content expertise. In the past, boards often relied on the chief executive officer (CEO) to manage clinical issues while the board focused its attention on traditional business issues: strategic planning, financial management, and community benefit. Finally, the unique aspects of medical staff-hospital relationships also conspired to keep boards away from direct oversight of clinical care. In most NFP hospitals, physicians were individual entrepreneurs, not employees of the hospital, and medical staffs had considerable leeway over their organization and practice. It was an unusual board that chose to step into the complex politics involving the relationships between medical staffs and hospitals. The result was that while boards had legal responsibility to oversee quality and safety, the *de facto* practice placed quality and safety oversight in the trusted hands of the medical staff, the CEO, and hospital administrative leaders.

Boards, as external, representative oversight bodies, protect and advance owner or stakeholder interests in the organizations they govern. In contrast to investor-owned companies in which shareholder votes guide board decision making, NFP hospital boards make decisions on their own and must balance the often conflicting interests and goals of their hospital, the medical staff, and the communities the hospital serves. Yet, all boards must adhere to legal and regulatory standards. In the wake of the SOX legislation, even NFP hospital boards face increased scrutiny of their financial accountability as well as their attention to the performance of the core business: patient care.[11,12]

Though the specific duties of boards are often ambiguous and may vary,[13-15] there is widespread consensus on the following broad governance responsibilities:

- Formulate organization mission and key goals.
- Ensure high levels of executive performance.
- Ensure high quality of care.
- Ensure high quality financial management.

Boards have the legal duties of care, loyalty, and obedience.[1] The duty of care refers to the obligation of corporate directors to act as follows: (1) in good faith, (2) with the care an ordinarily prudent person would exercise in like circumstances, and (3) in a manner that they reasonably believe to be in the

best interests of the corporation.[1] A board exercising its duty of care must consider quality and patient safety in all of its decisions. Obligations under this duty require the board to promulgate written bylaws or mechanisms that ensure the medical staff is accountable to the governing board for the quality of care provided to patients. They also require hospital leaders and elected members of the medical staff to codify standards and monitor competence of the credentialed medical staff. Board oversight activities for hospital quality and patient safety require discussing, investigating, and monitoring performance and allocating sufficient resources to ensure high-quality, safe care. Regulatory agencies (eg, US Centers for Medicare and Medicaid Services, US Food and Drug Administration) and accreditation agencies (eg, the Joint Commission) reinforce board accountability through standards that expressly guide governance structures, functions, and activities related to quality and patient safety.

The board duty of loyalty asserts that NFP board members owe allegiance in their deliberations and decision making to the hospital stakeholders (eg, community) rather than to personal interests or the interests of other organizations or individuals, including members of the medical staff. Boards must be hypervigilant with respect to their own conflicts of interest because they are responsible for overseeing medical staffs who themselves face immense pressure to avoid real and perceived conflicts with industry. This duty can pose a challenge. For example, many boards face strong pressure from physician leaders to support business ventures potentially perceived as skimming the cream (ie, removing well-paying patients) from the acute care setting. Physician board members may have unique appreciation for the entrepreneurial interests of their colleagues on the medical staff. Yet, the board role requires prioritizing hospital interests in board decision making. In the NFP sector, where the profit-making services cover the losses on services that are essential but not profitable, this shifting of volume could put the viability of the hospital at risk.

The duty of obedience requires adherence to the purpose and mission of the health-care organization. Although the CEO is generally the only hospital employee hired and evaluated directly by the board, the board has obligations that transcend the performance of the hospital administrative leader. The duty of obedience obligates the board to make certain that institutional policies and practices place a priority on the quality of patient care. These obligations are primary when leaders consider new hospital services or business ventures. Though boards delegate much work, they are ultimately accountable for everything that transpires in the name of the organization.

Board Structures and Functions

The term *governance structure* encompasses structural aspects of a board, including size, number, and types of committees; relationships to other boards in multisite organizations; rules for member recruitment, retention, and retirement; and mechanisms for board self-evaluation. Boards must meet a fiduciary responsibility to ensure the use of community assets for the benefit of the organization's social mission while they simultaneously address complex and rapidly changing business problems.

Board structure influences board effectiveness and efficiency. As in most things, parsimony is essential. The most effective structure has the fewest members, layers, and committees needed to perform these key board functions[16]:

- Formulate policy, conveying expectations and directives.
- Make decisions, choosing among alternatives.
- Monitor performance.

Until recently, hospital boards modeled their structure after non-health-care boards and from the business and management literature. This literature recommends evaluating board effectiveness largely by markers of company financial performance, such as balance sheets, market share analyses, and stock prices.[17] In this model, product quality is assumed to be reflected in financial performance. Such a view is necessary but insufficient in health care, where the quality of the product (in this case patient outcomes) must be directly measured rather than assumed. Given that most hospitals treat patients with hundreds of diagnoses and perform thousands of procedures, this is no easy task. Because most board members are not clinicians, their capacity to be effective in this role hinges in large part on functional relationships with the medical staff and a robust system to monitor quality of care. A recent study[18] of 35 hospital boards representing 50 hospitals in two states measured board characteristics

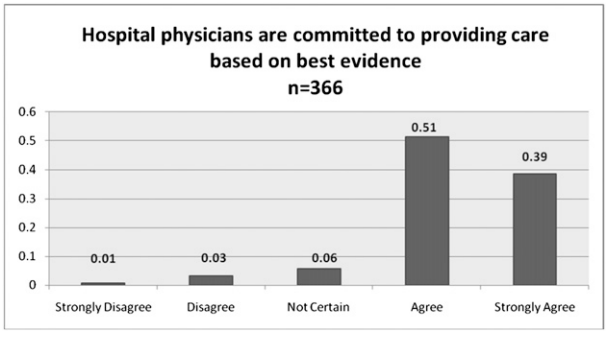

FIGURE 1. Board member perceptions of medical staff commitment to quality of care.

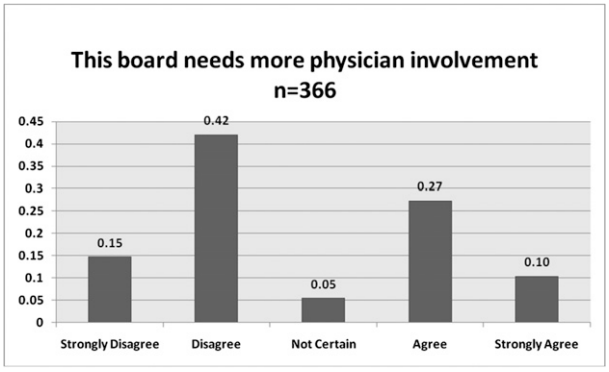

FIGURE 2. Board member perceptions of need for interaction with medical staff.

related to quality and safety oversight, and collected self-efficacy data from 366 individual board members. The overwhelming majority of board members reported their belief that the medical staff is committed to providing evidence-based care (Fig 1), yet nearly half of board members believe the board needs more physician involvement (Fig 2). These results illuminate the challenge: Boards are feeling the need to better understand the clinical care delivered in their institutions but are likely to continue to need to delegate individual care decisions to physicians (most of whom are not employees) and, more broadly, to the medical staff. Although placing some physicians on the governance board is likely to be part of the answer, it does not completely reconcile these tensions.

Physician Involvement in Quality and Patient Safety Oversight

Since the late 1990s, physicians have been increasingly serving as hospital leaders and on hospital boards. Yet, whether hospitals with physicians in senior leadership roles provide higher-quality care than hospitals that lack physician leaders is uncertain. There is limited empirical evidence on the impact of physician involvement in management and governance, and early research identified apparent associations with improved efficiency, not quality of care.[19] Nevertheless, the growing pressure to address quality and safety problems has increased interest in physician-board collaboration.

The board must create a quality and patient safety improvement system that is meaningful, measurable, and manageable. This requires both technical and adaptive work, and a combination of business acumen, clinical knowledge, and courage. The technical work of improvement involves identifying known solutions to performance problems, ensuring patients reliably receive evidence-based therapies, and monitoring performance. Physician involvement in these areas is essential. Physician involvement is also essential to adaptive work, which involves changing attitudes, beliefs, and behaviors needed to provide high-quality and safe patient care. Though boards are responsible for both the technical and adaptive work of quality and safety improvement, they cannot successfully address adaptive challenges unless individual physicians and medical staff leaders work cooperatively with them. Boards can collaborate with physicians by appointing them to leadership roles or by participating in hospital committees and medical staff meetings. With increasing frequency, governing boards recruit physician members.[20] The physician-trustee role is not easy.[21] These physicians must balance tensions and conflicts of interests in advocating for the medical staff, the hospital, and the community (Table 1). For example, the board may vote on adding a new service that could compete with the physician's practice.[22,23] To circumvent those challenges, some boards recruit physician-trustees who are not credentialed members of the medical staff. Most boards also have well-documented conflict of interest policies to guide decision making, though the degree to which these truly mitigate the problems is uncertain. The conflicts are not only with physicians. Nonphysician board members may, and often do, disregard quality-of-care problems with a physician who brings in a large number of patients or large amounts of revenue. Physician accountability is poorly developed in most hospitals.[24]

Empirical literature describing differences in hospital performance related to numbers and types of physicians on the board is just beginning to emerge.[15,25-27]

Table 1—*Hospital Leadership Roles for Quality and Patient Safety*

Trustees	CEOs	Physicians as Clinicians
Act as a body with a single voice	Act as individual	Autonomous professionals
Hospital and community focus	Hospital focus	Patient focus
Develop strategy and policy	Implement strategy and policy	Develop and implement patient plan of care
Legally accountable for hospital quality and safety	Position-specific shared accountability	Patient-specific shared accountability
Generally not health-care experts	Administrative expert	Clinical experts
Typically volunteers	Paid hospital employee	Typically independent practitioners
Strategic institutional knowledge	Detailed institutional knowledge	Detailed patient knowledge

CEOs = chief executive officers.

Early studies suggested that physician-at-large board members might favor traditional methods for ensuring quality of care (eg, quality assurance, risk management, utilization review) more than interactive and proactive processes.[22] Studies that are more recent have not replicated that result, but do support the performance advantage of boards with high physician membership.[16] Physicians interested in leading quality and patient safety efforts should make their interests known to hospital leadership and prepare diligently for a governance role.

Recommended Governance Practices for Quality Improvement and Patient Safety

Most board-related research focuses on board attributes and structural elements: the size of the board, board composition including the presence or absence of physician board members, board orientation and ongoing education for the role, and prior board experience. Research increasingly suggests, however, that in complex organizational systems such as hospitals, boards interconnect with hospital leaders and medical staff members, who perform in a mutually reinforcing and systemic manner.[15] Governance of quality and safety in hospitals continues to be shaped by a combination of scant but growing evidence and tacit knowledge for structures and functions that seem to be effective at improving quality. Some of the most widely accepted practices include:

1. Boards should have a separate quality and patient safety committee that meets regularly and reports to the full board. Evidence suggests boards with such a committee spend more time on improvement activities, and their hospitals may have better outcomes.[16] If the board does not have a separate quality and patient safety committee, there should be clear evidence that quality and patient safety is an active agenda item at each board meeting.
2. Boards should ensure the existence and annual review of a written quality improvement and patient safety plan that reflects systems thinking, contains valid empirical measures of performance, and is consistent with national, regional, and institutional quality and safety goals. Physicians interested in leading quality and safety efforts or growing toward a governance role should ask to see the plan and contribute to it.[28,29]
3. Boards should have an auditing mechanism for quality and safety data, just as they do for financial data. While data quality control principles apply to clinical research and apply to financial data through generally accepted accounting principles, data quality in measuring quality and patient safety has received little to no attention in most health-care organizations.[30,31]
4. Boards should routinely hear stories of harm that occurred at the hospital, putting a face on the problem of quality and patient safety. Stories may be case reviews presented by staff or interactions with patients or families who suffered harm.
5. Boards should base compensation for the CEO on achievement of measurable improvement targets for key responsibilities including quality of care and patient safety.
6. In conjunction with the CEO and medical staff leaders, boards should identify specific, measurable, valid quality indicators consistent with strategic goals and hospital services, and review performance against the indicators no less than quarterly. Such review should include:

    a. Regular quantitative measurement against benchmarks.
    b. Reported compliance with rigorous data quality standards.
    c. Performance transparency.
        i. Weekly or monthly reports of harm.
        ii. Sentinel event and claims review for quality and safety problems.
    d. Methods for active intervention to improve care.
        i. Survey of quality and safety culture.
        ii. Use of survey results to shape improvement efforts.
        iii. Routine mechanism to tap the wisdom of bedside caregivers.

Finally, boards should obtain continuous education on quality and patient safety standards, the growing body of empirical literature examining board effectiveness for quality and patient safety, and emerging national expectations for quality and safety performance in hospitals.[16] Physician leaders may provide such education and may suggest joint medical staff/board training when emerging requirements are new for both groups. Such training is essential given that most board members lack the technical expertise to monitor quality and safety, which is in stark contrast to their ability to monitor financial performance. Collaborative workshops can set the stage for true institutional learning and expedite quality and safety improvements.

Model for a Meaningful Safety Scorecard

Boards face substantial challenges in monitoring quality of care and patient safety. Current measures

to evaluate progress in patient safety do not provide an adequate evaluation of services across an institution and many are of dubious validity. Without rigorous and standardized measurement, boards, hospital leaders, and medical staffs do not know whether care is really any safer than it was previously. Boards are often left monitoring what administrative staffs determine is important (or, to be less charitable, what administrative staffs want boards to see, sometimes highlighting successes rather than harsh truths), using tools that may be less than informative.

Unfortunately, a clear and standardized national framework to measure and report quality and safety performance does not yet exist. Although the Centers for Medicare and Medicaid Services publicly report a few standardized hospital quality indicators, these reflect an extremely small portion of health-care services and generally focus on processes of care (what clinicians do) rather than outcomes (the results achieved). A recent study pointed out the limitations of public quality reporting, including inconsistent patient definitions, varying reporting periods, and differing measures of structures, processes, and outcomes, such that there is little agreement across public Web sites on the quality of the same hospital.[32]

Moreover, much of the quality information reported to boards can misinform rather than inform. For example, hospitals often report data as rates (eg, self-reported medication errors) when, in fact, they do not satisfy scientific parameters for rate-based measurement. Medication errors are obtained from error reporting systems that are notoriously inaccurate as rates; in these self-reported systems, a small and nonrandom proportion of errors is reported (in fact, increases in reported numbers of errors are often hailed as evidence of a "safety culture"). As such, changes in rate over time likely reflect reporting bias more than changes in patient safety.[30,33] Rate-based measures require a clearly defined numerator (events) and denominator (those put at risk for the event), as well as a surveillance system for identifying both and defined methods for minimizing measurement bias. Most measures of patient safety lack these attributes. Without these defined characteristics, measures can actually misinform board members and administrators.

Table 2—*Board Scorecard for Quality and Patient Safety*

Questions to Measure Progress	Type of Metric
How often do we harm?	Rate-based outcome measures
How often do we provide evidence-based care?	Rate-based process measures
How do we know if we have learned from mistakes?	Nonrate-based process measures
Have we created a quality and patient-safety culture?	Nonrate-based outcome measures

Our experience in developing and disseminating an intervention to reduce the rate of central line-associated bloodstream infections (CLABSIs) provides an instructive model for boards. This program used tools to improve teamwork and safety culture, summarized clinical evidence into a checklist, measured infection rates using US Centers for Disease Control definitions and rigorous data collection criteria, and reported results at the unit, hospital, and state levels. We implemented the program in ICUs across the state of Michigan and reduced the incidence of CLABSIs by 66%, saving an estimated 1,500 lives and $200,000 annually in that state.[34,35] Rates fell to a median of zero. The evidence-based interventions used in the study are not costly or controversial. They are, however, both technical and adaptive in nature. Thus, they require concerted effort, dedicated resources, and leadership support. Federal funding is making the program publicly available to all 50 states, and evidence for the value of the intervention is now strong enough that measures of CLABSI, not subject to the bias of self-reports, should be monitored by every board.

Table 2 illustrates a patient safety framework (originally developed for the ICU CLABSI project) that may be used alone as a tool for boards and hospital quality and safety committees, or as part of a hospital's balanced scorecard. Within the framework, we stratify measures into two categories: measures that we are and are not able to validly measure as rates. Nonrate measures are important, but we must be cautious about how we use them to evaluate patient safety progress.[36,37]

Among the rate-based measures, the board should routinely require answers to two key questions that address outcome and process measures: How often do we harm patients (such as with CLABSI)? and, How often do we provide evidence-based care (such as providing antibiotics prior to surgery)? Yet, most issues in safety cannot be measured as rates, and clinicians and administrators should not present them as rates. For the nonrate-based measures, boards should ask the CEO and medical staff leaders two additional key questions: How do we know we have learned from our mistakes? and, How well have we created a culture of safety? These questions address the extent to which risks to future patients from specific hazards have been reduced. Boards can evaluate, learning from mistakes (such as adverse events) by seeking answers to the following questions: What happened? Why did it happen? What did you do to reduce risks to future patients? and, How do you know risks were actually reduced? Unfortunately, this last question is often neglected. Hospitals need to learn from mistakes at the unit, department, and health system

levels. Nevertheless, the science of determining the most appropriate level to implement interventions is underdeveloped. Safety culture can be measured by surveys administered to staff. There are a variety of validated surveys to measure safety culture. Although these surveys are administered annually, it is essential that they be conducted with scientific rigor so results provide valid information. This requires high responses rates and surveying all clinical employees so that unit-level reports are available. Culture seems to vary much more among units within a hospital than among hospitals. As such, hospital-level sampling may miss important variation in safety culture within a hospital.[38-40]

Using the four-question scorecard to organize all quality and safety metrics in conjunction with use of the red, yellow, and green color coding that is often used on balanced scorecards can provide complementary value. At a glance, leaders will see not only where additional focus is needed but also whether patient safety and quality efforts are balanced across the critical dimensions of measuring harm, providing evidence-based care, learning from mistakes, and creating a culture of safety. The science of how to measure quality and safety is immature, changing, and in need of robust research funding. Yet, physician leaders need to ensure their hospital quality and safety scorecards are scientifically sound, important, and usable and that the inferences boards of trustees make about the quality and safety of care are appropriate for the data provided.

Conclusions

Hospital boards face increased accountability for the quality and safety of care in their organizations. Many boards are responding admirably, and all of them can do so if they and their medical staffs are willing to adapt.

Boards must engage their medical staffs by becoming more involved in and educated about the quality of care provided in their institutions and by inviting physicians to join the governing body. Medical staff members should understand the unique duties of boards, which may help soften the inevitable conflicts that arise when boards and physicians embrace divergent goals or strategies.

In addition to appropriate physician-level expertise and engagement, boards require supportive structures and processes to fulfill their mission. Board members must be sufficiently educated in quality and safety management and measurement. Given the substantial resources required to develop robust measures of patient safety, national organizations should develop measures that have broad use. Hospital boards should review and allow sufficient time to discuss quality and safety performance at all board meetings. Boards will increasingly require more information about quality and safety of care provided within their institutions. This will include both rate-based and nonrate-based indicators.[36] Boards need to hold CEOs and medical staff leaders accountable for improvements on both kinds of measures and ensure that the institution has the resources and will to improve. Being a board member today is more demanding and potentially more rewarding than ever before. Communities now expect hospital boards to measurably influence quality and safety performance. New board structures, board education, and performance reports are necessary but likely not sufficient to accomplish the desired improvement. Many boards are finding that this challenge requires a new level of collaboration with the organization's medical staff in shared efforts to improve care.

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References

1. Callendar AN, Hastings DA, Hemsley MC, et al. *Corporate Responsibility and Health Care Quality: A Resource for Health Care Boards of Directors.* Washington, DC: US Department of Health and Human Services, Office of Inspector General; 2007.
2. Jha AK, Epstein AM. Hospital governance and the quality of care. *Health Aff.* 2010;29(1):182-187.
3. Burns LR, Cacciamani J, Clement J, et al. The fall of the house of AHERF: the Allegheny bankruptcy. *Health Aff.* 2000; 19(1):7-41.
4. Peregrine MW, Broccolo BM. "Independence" and the nonprofit board: a general counsel's guide. *J Health Law.* 2006;39(4):497-526.
5. Kohn LT, Corrigan JM, Donaldson MS, eds. *To Err Is Human: Building a Safer Health System. Report from the Committee on Quality of Health Care in America.* Washington, DC: National Academy Press; 1999.
6. Committee on Quality of Health Care in America, Institute of Medicine. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academy Press; 2001.
7. McGlynn EA, Asch SM, Adams J, et al. The quality of health care delivered to adults in the United States. *N Engl J Med.* 2003;348(26):2635-2645.

8. Orlikoff JE, Totten MK. *The Trustee Handbook for Health Care Governance*. 2nd ed. San Francisco, CA: Jossey-Bass; 2001:310.
9. Pointer DD, Orlikoff JE. *Board Work: Governing Health Care Organizations*. 1st ed. San Francisco, CA: Jossey-Bass; 1999:292.
10. Longo DR, Alexander J, Earle P, Pahl M. Profile of hospital governance: a report from the nation's hospitals. *Trustee*. 1990;43(5):6-8.
11. Alexander JA, Weiner BJ, Bogue RJ. Changes in the structure, composition, and activity of hospital governing boards, 1989-1997: evidence from two national surveys. *Milbank Q*. 2001;79(2):253-279, IV-V.
12. Tregoning S. Hospital board structure: changing form and changing issues. *Aust Health Rev*. 2000;23(3):28-37.
13. Connelly MD. The sea change in nonprofit governance: a new universe of opportunities and responsibilities. *Inquiry*. 2004;41(1):6-20.
14. Pointer DD, Orlikoff JE. *The High-Performance Board: Principles of Nonprofit Organization Governance*. 1st ed. San Francisco, CA: Jossey-Bass; 2002:186.
15. Lee SY, Alexander JA, Wang V, Margolin FS, Combes JR. An empirical taxonomy of hospital governing board roles. *Health Serv Res*. 2008;43(4):1223-1243.
16. Prybil LD. Size, composition, and culture of high-performing hospital boards. *Am J Med Qual*. 2006;21(4):224-229.
17. Weiner BJ, Alexander JA. Corporate and philanthropic models of hospital governance: a taxonomic evaluation. *Health Serv Res*. 1993;28(3):325-355.
18. Goeschel CA. *Quality, Patient Safety, and Boards of Trustees: Implications for Creating Safer Healthcare*[dissertation]. Tulane University School of Public Health and Tropical Medicine; 2010.
19. Succi MJ, Alexander JA. Physician involvement in management and governance: the moderating effects of staff structure and composition. *Health Care Manage Rev*. 1999;24(1):33-44.
20. Becher EC, Chassin MR. Taking health care back: the physician's role in quality improvement. *Acad Med*. 2002;77(10):953-962.
21. Shortell SM, Alexander JA, Budetti PP, et al. Physician-system alignment: introductory overview. *Med Care*. 2001;39(7 Suppl 1):I1-I8.
22. Weiner BJ, Shortell SM, Alexander J. Promoting clinical involvement in hospital quality improvement efforts: the effects of top management, board, and physician leadership. *Health Serv Res*. 1997;32(4):491-510.
23. Alexander JA, Ye Y, Lee SY, Weiner BJ. The effects of governing board configuration on profound organizational change in hospitals. *J Health Soc Behav*. 2006;47(3):291-308.
24. Wachter RM, Pronovost PJ. Balancing "no blame" with accountability in patient safety. *N Engl J Med*. 2009;361(14):1401-1406.
25. Alexander JA, Lee SY, Wang V, Margolin FS. Changes in the monitoring and oversight practices of not-for-profit hospital governing boards 1989-2005: evidence from three national surveys. *Med Care Res Rev*. 2009;66(2):181-196.
26. Hearld LR, Alexander JA, Fraser I, Jiang HJ. Review: how do hospital organizational structure and processes affect quality of care? A critical review of research methods. *Med Care Res Rev*. 2008;65(3):259-299.
27. Alexander JA, Lee SY. Does governance matter? Board configuration and performance in not-for-profit hospitals. *Milbank Q*. 2006;84(4):733-758.
28. Orlikoff JE, Totten MK; American Hospital Association. *The Trustee Handbook for Health Care Governance*. Chicago, IL: AHA Press; 1998:140.
29. Orlikoff JE, Totten MK. Trustee workbook 2. Best practices in governance: what makes great boards great. *Trustee*. 2003;56(4):15-18.
30. Pronovost PJ, Miller M, Wachter RM. The GAAP in quality measurement and reporting. *JAMA*. 2007;298(15):1800-1802.
31. Needham DM, Sinopoli DJ, Dinglas VD, et al. Improving data quality control in quality improvement projects. *Int J Qual Health Care*. 2009;21(2):145-150.
32. Rothberg MB, Morsi E, Benjamin EM, Pekow PS, Lindenauer, PK. Choosing the best hospital: the limitations of public quality reporting. *Health Aff*. 2008;27(6):1680-1687.
33. Pronovost PJ, Berenholtz SM, Goeschel CA. Improving the quality of measurement and evaluation in quality improvement efforts. *Am J Med Qual*. 2008;23(2):143-146.
34. Pronovost P, Needham D, Berenholtz S, et al. An intervention to decrease catheter-related bloodstream infections in the ICU. *N Engl J Med*. 2006;355(26):2725-2732.
35. Pronovost PJ, Berenholtz SM, Goeschel CA, et al. Creating high reliability in health care organizations. *Health Serv Res*. 2006;41(4 Pt 2):1599-1617.
36. Pronovost PJ, Miller MR, Wachter RM. Tracking progress in patient safety: an elusive target. *JAMA*. 2006;296(6):696-699.
37. Goeschel C. Monitoring patient safety and quality: a simple framework. *Trustee*. 2008;61(3):34-35.
38. Pronovost PJ, Holzmueller CG, Martinez E, et al. A practical tool to learn from defects in patient care. *Jt Comm J Qual Saf*. 2006;32(2):102-108.
39. Pronovost PJ, Holzmueller CG, Needham DM, et al. How will we know patients are safer? An organization-wide approach to measuring and improving safety. *Crit Care Med*. 2006;34(7):1988-1995.
40. Pronovost PJ, Sexton B. Assessing safety culture: guidelines and recommendations. *Qual Saf Health Care*. 2005;14(4):231-233.