

Closed Medical Negligence Claims Can Drive Patient Safety and Reduce Litigation

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Abstract

Background Medical liability reform is viewed by many physician groups as a means of reducing medical malpractice litigation and lowering healthcare costs. However, alternative approaches such as closed medical negligence claims data may also achieve these goals.

Questions/purposes We asked whether information gleaned from closed claims related to medical negligence could promote patient safety and reduce costs related to medical liability. Specifically, we investigated whether physician groups have examined such data to identify error patterns and to then institute specific patient treatment protocols.

Methods We searched for medical societies that have systematically examined closed medical negligence claims in their specialty to develop specific standards of physician

conduct. We then searched the medical literature for published evidence of the efficacy, if any, related to the patient safety measures thus developed.

Results Anesthesia and obstetric physician societies have successfully targeted costs and related concerns arising from medical malpractice lawsuits by using data from closed claims to develop patient safety and treatment guidelines. In both specialties, after institution of safety measures derived from closed medical negligence claims, the incidence and costs related to medical malpractice decreased and physician satisfaction improved.

Conclusions Tort reform, in the form of legislatively prescribed limits on damages arising from lawsuits, is not the only means of addressing the incidence and costs related to medical malpractice litigation. As the experience of anesthesia and obstetric physicians has demonstrated, safety guidelines derived from analyzing past medical malpractice litigation can achieve the same goals while also promoting patient safety.

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Introduction

Medical liability reform advocates argue that our civil medical liability system is a chaotic, unpredictable, and hostile process that has contributed to yet another liability crisis in the United States [32]. Some see a government-mandated reform that restricts this system as a desirable solution to this problem [28]. Specifically, alternative forms of compensation [23], damage caps limiting the right of recovery [7], and various means of making it onerous for a plaintiff to obtain and use a medical expert [18] have all been suggested as legislatively imposed strategies to reduce the burden of medical malpractice litigation.

However well-intentioned these tort reform measures, it is a fact that our legal system does not yet offer any special liability mechanism for errant physicians. Medical malpractice claims are adjudicated by the principles of tort law. These principles require that an individual patient claiming medical injury must prove that a duty arising from the doctor-patient relationship existed and that such duty was breached sufficiently to result in measurable damages that are amenable to monetary restitution [4]. At present, tort law, whether through formal litigation or other methods of dispute resolution such as arbitration and mediation, is the only legal mechanism whereby medical errors are held accountable and injured patients are compensated. Hospital peer review is an internal mechanism for monitoring patient safety and quality of care, but peer review does not aim to compensate injured patients.

The purposes of this review are to first examine patient safety and medical errors, as set forth in an influential report by the Institute of Medicine, an independent, non-profit organization that works outside the government and that provides unbiased, authoritative information to decision-makers and the public. Next, medical ethics and legal principles related to medical errors are addressed followed by an examination of the success of anesthesia and obstetric physicians in addressing patient safety and limiting errors by developing treatment guidelines from a review of closed medical negligence claims in their respective specialties. Finally, the limitations of the existing peer review process in addressing medical errors and compensating injured patients are examined. We hope this article will provide physicians with an expanded view of medical errors and patient safety and an understanding of the value of the tort system and closed medical negligence claims in addressing patient safety and reducing the incidence of medical errors.

Search Strategy and Criteria

The websites of all recognized medical specialties in the United States were examined to see which ones had instituted patient safety measures derived from an examination of closed medical negligence claims specific to that society. We limited the search to those societies that had instituted such measures at least 10 years previously to allow sufficient time for published evidence of any efficacy of such measures. To identify articles related to the efficacy of medical society safety guidelines derived from closed claim review, we then searched the Ovid Medline database using selected keywords such as “medical errors” and “negligence” with the assistance of a professional librarian. From these sources, the information that follows was derived.

The Institute of Medicine Report

In 1999, the Institute of Medicine (IOM) issued a report entitled *To Err Is Human: Building a Safer System* [9]. In that document, the IOM emphasized systems of care designed to avoid errors. Although the IOM focused on preventing future errors through a systems-based process, its report also targeted individual accountability by stating that “people still must be vigilant and held responsible for their actions” [9]. The report further stated that “unsafe care is one of the prices we pay for not having organized systems of care with clear lines of accountability” [9]. In essence, the IOM position mirrors the goals of the civil justice system, namely that individual accountability is a necessary component of addressing medical errors. Indeed, the IOM report implied that tort liability can help reduce medical errors when it said that “liability is part of the system of accountability and serves a legitimate role in holding people responsible for their actions” [9].

One interpretation of patient safety relates to the prevention of healthcare errors and the elimination or mitigation of patient injury arising from those errors. A healthcare error has been defined as an unintended outcome caused by a defect in the delivery of care to a patient [25]. Five years before the IOM report, the *Journal of the American Medical Association* editorialized that the subject of medical error was distinctly unpopular among physicians and that “mistakes have been treated as uncommon and atypical, requiring no remedy beyond the traditional incident reports and morbidity and mortality conferences” [6]. The editorial further urged that information learned from past errors should be viewed as treasures to help make future care safer. The IOM report held a similar view, stating that when it came to the subject of medical errors, “silence surrounds this issue” in the face of a cycle of inaction on the part of the medical profession [9].

Despite the findings of the IOM, the prevailing culture related to addressing medical errors proved resistant to change. Five years after its report was issued, two IOM committee members lamented that “progress has been frustratingly slow” and that “building a culture of safety has proven to be an immense task and barriers are formidable” [22].

The barriers to building patient safety are multifactorial, but at least some are related to technological advances that drive the quality and complexity of medical care. For example, if technology offers a treatment today that simply did not exist 5 years ago, then an error leading to failure of that treatment could produce injury today when such injury would not have been possible 5 years previously. The more complex medical technology becomes, the greater the likelihood that something will go wrong, ie, an error will

occur. The systems of care urged by the IOM can prevent medical errors only if healthcare providers are proactively motivated and accept legal accountability as a necessary component of safety. Immunization from liability, as suggested by some advocates of tort reform, is contrary to the rational premise that rules and laws set forth in our civil justice system must apply to all parties, including physicians.

Medical Ethics and Legal Principles Related to Medical Errors

The ethics of the medical profession do not specifically advocate tort reform aimed at limiting physician liability; instead, published statements appear to favor disclosure of errors and patient compensation. For example, the American Board of Internal Medicine has remarked that “Physicians should also acknowledge that in health care, medical errors that injure patients do sometimes occur. Whenever patients are injured as a consequence of medical care, patients should be informed promptly because failure to do so seriously compromises patient and societal trust. Reporting and analyzing medical mistakes provide the basis for appropriate prevention and improvement strategies and for appropriate compensation to injured parties” [1]. Other medical specialty societies, including the American Academy of Orthopaedic Surgeons, have issued similar position statements that impose on their physicians an obligation to acknowledge that injurious medical errors can happen and that disclosure and patient compensation contribute to public trust and the implementation of error prevention and improvement strategies.

In some nations, medical mistakes may be litigated in the criminal justice system [12, 24], where punitive sanctions can be levied against errant physicians. The US civil justice system, in contrast, is not punitive but is designed to promote a just culture that balances individual accountability with system accountability. Tort liability in the US system arises from a contractual relationship whereby a patient bargains for a desired health outcome coupled with physician compensation and attendant responsibility to avoid errors. Liability usually arises on a failure to take appropriate precautions to minimize risk. The obligation to make remedial payment in the face of patient injury is rooted in the moral concept that on the finding of culpability, a physician or hospital should bear financial responsibility for the bad outcome. The obligation to pay is also rooted in policy considerations; for example, as a utilitarian measure, financial restitution alerts the system that the law demands the exercise of due care consistent with any contractual relationship between parties in a civil society [27].

Fairness and the due process of law require that the rules of evidence apply to every jury trial conducted in our civil justice system. Due process includes the right of every defendant physician to have his or her attorney cross-examine witnesses and a right to present evidence supporting the defense position, including expert opinions that refute the patient’s allegations. The burden of proof is entirely on the aggrieved patient; the physician accused of medical negligence has nothing to prove. All jurors are obligated, under penalty of oath, to render a decision within the framework of law that is embodied in the jury instructions. A physician who perceives that he or she has been legally aggrieved always has the right of appeal in our legal system [30].

Monetary payments, mandated by jury verdict, or a result of negotiations that lead to a settlement, are typically made by physician insurance companies. These payments reflect either a voluntary, mutually agreed-on state of reconciliation between litigants or the verdict issued at the end of a jury trial that, if appealed, has been sustained by legal due process. Rather than being arbitrary or capricious, such payments reflect a fully informed prediction that due process would confirm error and, if necessary, a judgment would be sustained on appeal [26]. Because litigants have first-hand knowledge of all factual information, legal settlements reflect financial values in which any inefficiency is arbitrated away during party negotiations. Closed-claims data related to medical malpractice are therefore a credible source of information to understand error patterns and identify means of improving patient safety.

The Anesthesiology Safety Model

The IOM report upheld the example of the American Society of Anesthesiology (ASA) as a model of patient safety [9]. In 1990, the ASA had faced a malpractice crisis with an increasing number of lawsuits, increasing liability premiums, and declining professional satisfaction; ASA leadership sought to address these concerns by investigating complications and errors in the profession [13, 31]. The ASA leadership correctly acknowledged that patient safety was imperfect in the profession and that like other medical problems, it was amenable to investigation and corrective measures.

ASA leadership galvanized its members to address serious issues that impacted patient safety and contributed to high medical liability insurance costs. The ASA used retrospective studies of closed malpractice cases to identify avoidable injury and death, and study data were then used to identify minimum safety standards [10, 11, 14, 29]. Examination of closed liability claims played an important role in the resulting safety strategy because each claim that

was examined contained a wealth of information related to medical error and resulting injury. Such information could not have been derived from other sources such as internal hospital peer review. By implementing mandatory safety standards, the ASA dramatically improved safety. Data obtained after the safety measures were adopted showed that the incidence of anesthesia-related deaths dropped from one to two per 10,000 anesthetic procedures to one for every 200,000 procedures [15]. Also, after safety measures were implemented, the costs of anesthesia medical malpractice insurance premiums dropped dramatically and the profession was happier [14]. As the IOM observed, it is instructive to examine how the ASA improved patient safety; specifically, the input data that were used by that organization to achieve what is now regarded as a safety benchmark among medical specialties.

The reason why closed claims offer valuable information relates to the nature of adversarial litigation and the dynamics of the civil justice system described previously. The injured patient has a legal professional advocate, ie, an attorney with a financial incentive to screen the case, and then diligently pursues the merits of the case. The patient, through the attorney, has a broad right of discovery to question each healthcare professional under oath. To prevail at trial, the attorney must obtain independent expert opinions and offer proof to support the allegations. Equally, the defending parties have a full right of discovery and unfettered freedom to challenge and contradict patient allegations, expert testimony, and the proof offered. The liability insurance carrier, who must make financial payment in the event of an adverse judgment, has similar access to independent counsel, experts, discovery, and factual data relevant to the case. The burden of proof to substantiate the allegation of medical malpractice is on the injured patient, who is an active and direct participant in the litigation.

In contrast to adversarial litigation, closed peer review does not permit participation of the injured patient. In place of the openness, balance, and independence of civil litigation, closed internal quality review can run the risk of rationalizing away injury-producing errors, thereby contributing to system complacency and inaction. Critical examination of medical errors captured in closed medical malpractice claims can reveal a wealth of information that is relevant to understanding patterns of error and patient injury [5, 6, 21]. The ASA experience shows that such data can be constructively used to understand past errors, institute patient safety mechanisms, and reduce liability claims in the future.

The Experience of Obstetric Physicians

High liability insurance costs have affected other specialty areas such as obstetrics, neurology, and orthopaedic

surgery [32]. Two recent independent studies have addressed medical liability costs related to labor and delivery obstetrical claims brought on behalf of brain-injured children; these cases attract attention because they are associated with large payments and high insurance costs. One such study reviewed prior closed obstetric claims and led to the formulation and implementation of a comprehensive redesign of the patient safety process [8]. Beginning in 2000, study authors implanted a unique, integrated approach to addressing errors in the approximately 220,000 deliveries performed annually at the Hospital Corporation of America, the nation's largest private healthcare delivery system. Working with a clinical advisory board and work group consisting of physicians and nurses, uniform processes, procedures, and checklists were developed. Every member of the obstetric team was empowered and required to intervene and halt any process deemed to be dangerous, and effective peer-review policies were instituted. Improved perinatal outcomes were realized with a lower maternity and fetal injury rate, lower primary cesarean delivery rate, and reduced rates of litigation [8]. The second largest obstetric study also used a similar approach [17]; in this study, the dollar amounts of liability compensation payments and the incidence of sentinel events such as evidence of newborn brain injury were used as benchmarks to compare the delivery of care before and after the implementation of safety initiatives. The authors reported that the average compensation payment decreased dramatically from more than \$27 million per year to approximately \$2.5 million per year and that sentinel events decreased from five per year to none.

The safety efforts undertaken by the ASA and by the obstetric physicians were both driven by liability insurance costs and professional dissatisfaction. Both groups relied on information from past closed liability cases to identify meaningful safety opportunities that led to improved professional satisfaction for their member physicians. Interestingly, in the two decades that followed implementation of the ASA safety guidelines, the posture of the obstetric community had been one of inaction. However, once the benefit of safety measures in the obstetric field were clear, one author that investigated this subject remarked that "Malpractice loss is best avoided by reduction in adverse outcomes and the development of unambiguous practice guidelines, rather than by attempting to make unusual care more 'defensible' through the use of nonspecific guidelines" [8].

Similar patient safety guidelines are available to orthopaedic surgeons as well. The Physician Insurers Association of America (PIAA) has examined each specialty, including orthopaedic surgery [3]. Using claims information, the PIAA has identified common errors and devised risk reduction strategies. Orthopaedic physicians

can use these data to proactively institute clear guidelines, whenever possible, to reduce the likelihood of professional error. In some orthopaedic subspecialties, such safety opportunities have been identified and implemented. For example, sports physicians recognize that although athletic care can be delivered by family doctors or general surgeons, the availability and on-site evaluation by an orthopaedic surgeon can expedite the diagnosis and treatment of serious conditions such as cervical spine injury, fractures, and heat stress [19]. Just as obstetricians have a proactive, professional obligation to protect a helpless child from brain injury as a result of hypoxic labor stress, team doctors have a similar obligation to protect a young student athlete from a superimposed brain injury after a concussion. Accordingly, ensuring that the physician team charged with athletic care includes an orthopaedic surgeon should lead to a lower incidence of athletic injury and the costs of attendant liability claims.

Efforts to defend ambiguous guidelines related to physician discretion and judgment can undermine patient safety and are contrary to basic precepts of error prevention. A more enlightened approach should accept that the proverbial ounce of prevention is mandatory and that the proverbial penny-wise, pound-foolish approach must be rejected. Such an enlightened approach is consistent with medical ethics and will prove to be an effective shield against the only legal theory that leads to medical liability, ie, that the standard of care was breached. Although the standard of care can have varying interpretations, and is subject to conflicting expert testimony, established safety protocols and clear guidelines provide evidence that the care delivered met the *de minimis* quality benchmark. Although it is an unfair reality that good physicians who deliver high-quality care are sometimes ensnared in the legal system, tort reform efforts at preventing those with valid liability claims arising out of avoidable error from seeking justice do not contribute to patient safety.

Limitations of Peer Review

Peer review is a foundation of professionalism in American medicine and an important mechanism whereby physicians maintain control over the standards of their profession [16]. Appropriately, the medical profession seeks autonomy by setting its own standards to achieve its ethically motivated goals. However, it is also recognized that physicians hesitate to criticize one another lest they lose referral work and that hospital personnel are reluctant to report or take action with regard to colleagues [26]. Balancing that hesitation is the financial incentive of physician-owned insurance companies and their member physicians to identify those colleagues who may be prone to negligence. That incentive

relates to creating practice restrictions that are targeted at improving patient care and creating financial benefits for those who are able to maintain a favorable claim record [26].

In the 2008 obstetric patient safety study referenced earlier [8], the authors remarked that after an obstetrician was board-certified, “few standard processes exist that will ever again adequately scrutinize the quality of the physician’s clinical care outside the local hospital peer review committee process.” Acknowledging that the achievement of large-scale quality improvement requires effective peer review, the authors noted that in practice, this is difficult to carry out, especially when reviewers find themselves either the partners or economic competitors of an individual being reviewed [8]. Clearly peer review, although laudable and desirable, is not as effective as one might hope because of inherent conflicts and limitations of the process. More specifically, the medical peer review process is not a substitute for the legal liability system in terms of identifying patterns of medical error, compensating injured patients, and driving patient safety guidelines.

Discussion

Many physicians consider legislatively mandated medical liability reform as a means of reducing medical malpractice litigation and lowering healthcare costs. However, alternative approaches such as closed medical negligence claims data may also achieve these goals. We asked whether the implementation of patient safety measures in the form of specific practice guidelines as a response to the costs and related burdens inflicted by medical negligence lawsuits have been helpful. In that context, we examined the limitations of medical peer review mechanisms in addressing errors and compensating injured patients and described the rationale and effectiveness of tort law principles in adjudicating legal claims related to medical error and patient injury. We hypothesized that data from closed medical negligence claims could be useful in identifying patterns of medical error and patient injury and that by addressing these concerns in a systematic way, physicians can improve patient outcomes and reduce the risk of malpractice litigation. We found that at least two medical specialties, ie, anesthesia and obstetrics, have done so; both professional groups encountered a liability crisis and responded by examining medical malpractice claims data to identify errors that proved amenable to patient safety guidelines and protocols that ultimately helped drive down the costs and incidence of medical malpractice litigation.

We identified a number of literature limitations and some limitations related to the literature search itself. First, other medical societies may have developed patient safety

guidelines from closed claims data analysis, but validation of such guidelines may be lacking, either as a result of a short duration since such guidelines were implemented or other reasons. Accordingly, although our search identified two examples of physician groups that effectively used closed claims data to achieve desired goals, there may be other physician groups with similar, or dissimilar, experiences that were not identified in our search. Although this work is not a comprehensive survey, we believe that the principle of examining past errors that have been tested by adjudication in our civil justice system is intuitively valuable in understanding medical errors and developing meaningful patient safety guidelines. Second, once implemented, patient safety guidelines are presumed to continue to promote patient safety by reducing medical error. This premise cannot account for the effects of changing technology and the influence of medical experience. Thus, an examination of medical errors captured in closed claims may contribute to a patient safety model, but such a model may prove to be static unless the retrospective exercise of critically examining medical errors is repeated periodically by medical societies. To our knowledge, no medical society has developed a systematic monitoring program whereby closed claims data are analyzed at defined intervals to identify emerging trends in medical mistakes that can be used to modulate existing patient safety and error-reduction standards. Third, there is a dearth of literature addressing the efficacy of patient safety guidelines derived from closed-claims review. Many articles that attest to impressive gains in medical error reductions are commentaries or editorials rather than scientific inquiries. One report, published in 2002, critically examined trends in anesthesia mortality rates and found that the implementation of anesthesia safety protocols a decade earlier did not, in fact, lead to a drastic decrease in mortality [20]. In fact, that report found a wide variation in anesthesia mortality rates based on a number of variables that were influenced by geography, hospital acuity of care, and a number of other uncontrollable factors. The author concluded that unless the methodology of data collection and analysis is standardized worldwide, scientific evidence of the efficacy of safety models in decreasing medical error on a systemwide basis will prove elusive [20].

The findings of this review are not dispositive. Contrary to the observation that obstetric physicians developed safety guidelines from closed-claim review that have addressed litigation fears, Zwickler et al. [33] reported in 2011 that the fear of medical malpractice litigation continues to have a marked effect on obstetric practice. In 2010, Abuhamad et al. [2] examined evidence to see if the institution of safety approaches led to fewer adverse events and related liability in obstetric cases; these authors remarked that there was a lack of empiric support in the

literature, particularly with regard to liability outcomes. Thus, although closed-claim analyses of medical negligence cases may contribute to a better understanding of medical errors, the resulting benefit on improved patient outcomes and reduced liability costs is not a consistent finding in the literature. This probably relates to many factors such as changes in technology and practice patterns over time, the difficulty in standardizing methods related to reporting outcomes and measuring litigation costs, and the lack of properly designed studies that can measure patient safety.

In conclusion, although it is claimed that the shortcomings of our civil justice system have led to a crisis in medical liability [32], reform of the tort system is not the only means of decreasing litigation incidence and costs. We have presented a contrasting view that some readers will approach with skepticism. Physicians manage patients based on intuitive and logical premises. It is possible to address the emotional trauma, anxiety, costs, and loss of productivity associated with medical malpractice lawsuits without legislatively prescribed immunity from lawsuits. The civil justice system offers a wealth of data in closed liability claims in terms of understanding human and system errors and patient injury. Some physician groups have used these data to develop patient safety guidelines that have reduced litigation and improved patient safety, although scientific proof of such may be inconsistent in the literature. The alternative of government-mandated physician immunity from professional liability lawsuits, in the form of tort reform, could lead to complacency and inaction instead. Physicians and their professional associations should take an enlightened approach to the underlying assumptions and barriers that impede a culture of safety and justice for all stakeholders.

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References

1. ABIM Foundation. American Board of Internal Medicine; ACP-ASIM Foundation. American College of Physicians-American Society of Internal Medicine; European Federation of Internal Medicine. Medical professionalism in the new millennium: a physician charter. *Ann Intern Med.* 2002;136:243–246.
2. Abuhamad A, Grobman WA. Patient safety and medical liability: current status and an agenda for the future. *Obstet Gynecol.* 2010;116:570–577.
3. American Physicians Insurance Co (API). Available at: www.API-C.com. Accessed July 10, 2011.
4. Bal BS. An introduction to medical malpractice in the United States. *Clin Orthop Relat Res.* 2009;467:339–347.
5. Blumenthal D. Total quality management and physicians' clinical decisions. *JAMA.* 1993;269:2775–2778.

6. Blumenthal D. Making medical errors into 'medical treasures.' *JAMA*. 1994;272:1867–1868.
7. Chou CF, Lo Sasso AT. Practice location choice by new physicians: the importance of malpractice premiums, damage caps, and health professional shortage area designation. *Health Serv Res*. 2009;44:1271–1289.
8. Clark SL, Belfort MA, Byrum SL, Meyers JA, Perlin JB. Improvement outcomes, fewer caesarean deliveries, and reduced litigation: results of a new paradigm in patient safety. *Am J Obstet Gynecol*. 2008;199:105.e1–105.e7.
9. Committee on Quality of Health Care in America, Institute of Medicine. Kohn L, Corrigan J, Donaldson M, eds. *To Err Is Human: Building a Safer Health System*. Washington, DC: National Academy Press; 1999:241.
10. Cooper JB, Gaba DM, Liang B, Woods D, Blum LN. The National Patient Safety Foundation agenda for research and development in patient safety. *Med Gen Med*. 2000;2(3):38.
11. Cottrell JE. Facing off: on the front line in the OR: can specially trained nurses safely administer anesthesia without physician supervision? *New York Times*. January 8, 2002.
12. Dahat PR, Yadav PS. Medical negligence and criminal law: an Indian perspective (April 16, 2010). Available at: <http://ssrn.com/abstract=1591159> or <http://dx.doi.org/10.2139/ssrn.1591159>. Accessed February 12, 2012.
13. Eichhorn JH. Prevention of intraoperative anesthesia accidents and related severe injury through safety monitoring. *Anesthesiology*. 1989;170:572–577.
14. Gaba DM. Anesthesiology as a model for safety in health care. *BMJ*. 2000;320:785–788.
15. Gluck PA. Patient safety: a new imperative. *ACOG Clin Rev*. 2001;6:1.
16. Goldman RL. The reliability of peer assessments of quality of care. *JAMA*. 1992;267:958–960.
17. Grunebaum A, Chervenak S, Skupski D. Effect of a comprehensive obstetric patient safety program on compensation payments and sentinel events. *Am J Obstet Gynecol*. 2011;204:97–105.
18. Hutchins JC, Sagsveen MG, Larriviere D. Upholding professionalism: the disciplinary process of the American Academy of Neurology. *Neurology*. 2010;75:2198–2203.
19. Kane M, White RA. Medical malpractice and the sports medicine clinician. *Clin Orthop Relat Res*. 2009;467:412–419.
20. Lagasse RS. Anesthesia safety: model or myth? A review of the published literature and analysis of current original data. *Anesthesiology*. 2002;97:1609–1617.
21. Leape LL. Error in medicine. *JAMA*. 1994;272:1851–1857.
22. Leape LL, Berwick DM. Five years after To Err Is Human: what have we learned. *JAMA*. 2005;293:284–290.
23. MacCourt D, Bernstein J. Medical error reduction and tort reform through private, contractually-based quality medicine societies. *Am J Law Med*. 2009;35:505–561.
24. Monico E, Kulkarni R, Calise A, Calabro J. The criminal prosecution of medical negligence. *The Internet Journal of Law, Healthcare and Ethics*. 2007;5(1). Available at: www.ispub.com/journal/the-internet-journal-of-law-healthcare-and-ethics/. Accessed February 11, 2012.
25. National Patient Safety Foundation definition. Approved by the NPSF® Board July 2003). Available at: www.npsf.org/html/about_npsf.html. Accessed July 10, 2011.
26. Sage W. Reputation, malpractice liability, and medical errors. *Columbia Public Law & Legal Theory Working Papers*. 2004:159.
27. Schwartz WB, Komesar NK. Doctors damages and deterrence: an economic view of medical malpractice. *N Engl J Med*. 1978;298:1282, 1288.
28. Stewart RM, Geoghegan K, Myers JG, Sirinek KR, Corneille MG, Mueller D, Dent DL, Wolf SE, Pruitt BA Jr. Malpractice risk and cost are significantly reduced after tort reform. *J Am Coll Surg*. 2011;212:463–467, 467.e1–42; discussion 467–469.
29. Stoelting R. APSF response to IOM medical error report. *Anesthesia Patient Safety Foundation Newsletter*. 2000;15:1.
30. Vidmar M. Juries and medical malpractice claims; empirical facts vs myths. *Clin Orthop Relat Res*. 2009;467:367–375.
31. Vitez T. A model for quality assurance in anesthesiology. *J Clin Anesth*. 1990;2:280–287.
32. Weinstein SL. Medical liability reform crisis. 2008. *Clin Orthop Relat Res*. 2009;467:392–401.
33. Zwecker P, Azoulay L, Abenhaim HA. Effect of fear of litigation on obstetric care: a nationwide analysis on obstetric practice. *Am J Perinatol*. 2011;28:277–284.