Creating a Culture of Patient Safety in a Primary-Care Physician Group

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ABSTRACT—Typically risk-management strategies have been applied to the inpatient setting. In 2003, a comprehensive risk-management program was introduced to ProHealth Physicians, one of the largest primary-care practice groups in Connecticut. The program included strategies for education, practice change, incentive and compliance. Performance metrics for clinician participation and compliance were prespecified. Clinicians’ attitudes and behavior change were assessed after introduction of the program. Audits were conducted by external reviewers to assess compliance. Financial data from before-to-after program implementation were compared. Results showed fewer claims and substantial cost savings. A strong commitment to the implementation of a comprehensive risk-management program can create a culture of safety in an outpatient setting.

In the decade following the publication of To Err is Human, efforts at patient safety have not been adequate; patients are still being injured.1,2 A report from the Office of the Inspector General of the Department of Health and Human Services estimated that for the month of October 2008, 13.5% of Medicare beneficiaries discharged from hospitals had an adverse event and another 13.5% were temporarily harmed.3 Placing this in the context of Medicare inpatient expenditures for 2009, it is estimated that these events cost $4.4 billion.3

Besides the human suffering and financial burdens imposed by medical errors another reality is the burden of medical malpractice. Economists have estimated that approximately 2% to 10% of medical costs in the United States are due to malpractice litigation.4 The financial impact of litigation extends beyond the dollar amount of settlements; each dollar awarded in settlements adds an estimated $4.77 to medical expenses.4 Although, a business approach to lessen these financial burdens is appropriate and is needed, humanistic and moral concerns also call for widespread attention to patient safety.5

Risk-management strategies have been applied predominantly to inpatient settings.6 This may be because safety efforts may be easier to implement in these environments.7 However, an analysis of malpractice claims in the outpatient setting illustrates the magnitude and seriousness of these claims; interventions to focus attention on patient safety in the outpatient setting are urgently called for.7

ProHealth Physicians, one of the largest primary-care groups in Connecticut, has taken a proactive approach to decrease adverse events. The purpose of this article is to describe the implementation of a risk-management program within this outpatient practice group.
goal was to improve patient care and reduce medical malpractice claims. The project sought to answer five questions: 1) What percentage of clinicians in the group will participate in education related to risk-management? 2) What percentage of clinicians express a positive attitude regarding the risk-management program? 3) What percentage of clinicians will change their practice to incorporate risk-management behaviors? 4) Will malpractice claims be reduced after the introduction of the risk-management program? and, 5) Is there an economic benefit for the participants?  

Methods  
This was an analysis of data to evaluate the impact of implementing a comprehensive risk-management program in a primary-care physician practice. In 2002, ProHealth Physicians’ insurance carrier conducted a risk-assessment of the group. A proprietary tool documented the assessment and included risk-scores for all providers. Each ProHealth physician was presented with his or her score and the specific areas that needed improvements. In late 2003, ProHealth Physicians hired an independent risk-management company to conduct their own risk-assessment. During this process it was discovered that the reports and recommendations provided to each ProHealth physician in 2002 were unexamined and unused. There was no structure in place to prioritize exposures and to implement and monitor practice change.  

Medical Risk-Management, LLC (MRM), a for-profit corporation, was commissioned to design and implement a risk-management program for the physician group. The program began in 2003. The first step of the risk-management program was to ensure a practice-wide commitment to the project. A risk-management committee (RMC) was created within the group to oversee all aspects of a long-term integrated risk-management program. The RMC reported directly to the Board of Directors. Members of the RMC include the chief medical officer, general counsel, vice president of information technology, chief financial officer, physician representatives from each medical specialty, and representatives from the physician group’s insurance carrier and the risk-management consultant.  

To create an economic incentive to participate in the program, the group implemented a retro-rated insurance model. This model allows the group to benefit from a reduction in malpractice losses. Once all claims and expenses have been paid for a policy year, if a premium surplus remains, it is returned to the physician group. Only those physicians who have successfully completed each of the required activities of the risk-management program for that policy year are eligible to receive the surplus. Since the 2005–2006 policy year, all ProHealth physicians have been required to pass an annual audit in order to participate in the retro-rated premium dividend program. If a physician is sued during a policy year when he or she was not in compliance with the risk-management program requirements, that individual is personally responsible for the first $10,000 for any indemnity payment made on his or her behalf.  

Once the RMC and incentives were established, the next step was to develop a program that would yield the greatest benefit to the group and improve patient safety. First, high-exposure areas needed to be identified. An extensive review of national and local medical malpractice closed claims for the primary-care specialties was conducted by MRM. The group’s claims data from the prior 10 years were also analyzed. Audits conducted by the company’s current and former liability insurance carriers were helpful, as were random audits of office and hospital data. Finally, the group commissioned MRM to conduct a comprehensive risk-assessment. This included confidential interviews with leadership in the organization to gather information regarding the organization’s culture and practice behaviors that increase risk. High-yield exposures were identified. It was found that 56.2% (95% CI, 45.8%–66.0%) of the group’s malpractice claims were related to failure or delay to diagnose or treat. It was decided that the target areas would be failure to diagnose colon cancer in adults and failure to diagnose depression in children. Because a large percentage of providers were not documenting after hours communications with patients, this area was also targeted.  

Education and Practice Change.—The next step was to design and implement the initial education for physicians, nurse practitioners, physician assistants, and office managers. This education focused on the fundamentals of risk-management: informed consent, documentation, standard of care and patient relations. This took place during 2004–2005 and provided a common foundation for all providers and administrators. A multimodality educational program was deployed with one activity scheduled every three months. The risk-management educational program consisted of an orientation session, web modules, and Risk-Management Rounds.® The web modules were available to all participants 24/7 and featured case-based learning taught by experienced medical malpractice defense attorneys and practicing physicians. Risk-Management Rounds® combine the tactics used in conventional peer review processes with those used in grand rounds. Case studies were presented to stimulate discussion of risk-exposures and management. Each session concluded with “risk-management takeaways,” critical points that should be implemented to mitigate risk. After attending the rounds, participants were asked to complete a questionnaire regarding the
value of the rounds. A bulletin was routinely distributed to keep clinicians informed of the program initiatives. A goal of 90% participation was prespecified for these education activities.

A second wave of education focused on practical risk-management strategies to mitigate the high-exposure areas of failure to diagnose colon cancer, failure to diagnose pediatric depression and physician-to-patient and physician-to-physician telephone communications. All previous educational methods used were employed again with each reinforcing the program themes to maximize impact. Prior to this second wave, a target participation rate of 75% was set. All educational sessions offered CME credit.

Once this second wave had taken place, specific strategies were developed to promote a change in practice behavior. These included establishing tracking and follow-up systems for each of the high-exposure areas. Prior to the implementation of these systems a target of 90% compliance was established.

Behavior change was evaluated by having clinicians complete questionnaires regarding their intentions to change behavior as well as their perceptions of the behavior changes they may have already made. An annual audit began in the spring of 2006 with two external independent auditors assessing compliance with specific practice change initiatives focused on tracking and following up of colon cancer diagnostic tests/screenings or tracking and following up on pediatric depression, and ensuring that after-hours telephone communications were documented in each patient’s chart. The audits include a site visit and extensive chart review for each physician.

Five years after the initial 2002 assessment performed by the insurance carrier, ProHealth Physicians requested that the risk-assessment be conducted again. Since the carrier was independently auditing the group and was utilizing the same assessment tool utilized five years earlier, ProHealth Physicians felt the results would help identify the success that the risk-management program was having on sustainable practice improvements. The carrier returned in 2007 and completed a comprehensive risk-assessment. Offices and physicians were assessed in the areas of telephone documentation, tracking and follow-up, and medical records documentation. A summary of strategic steps utilized by ProHealth Physicians to develop the risk-management program is presented in Table 1.

**Statistical Analysis.**—A claims analysis using descriptive statistics was performed to determine the number of claims filed solely against physicians prior to implementing the risk-management program and after its implementation. Any claim filed against the corporation or an individual physician group practice was not included in the analysis. T-tests were used to compare the number of claims for the years 1997 to 2003 before the implementation of the risk-management program to after its implementation during the years 2004 to 2011. The t-tests were two-sided. Means are expressed plus and minus the standard deviation. A P value of less than .05 was considered statistically significant. T-tests were calculated with SPSS version 14.0 (SPSS, Chicago, IL). Confidence intervals for percentages were calculated using the modified Wald method provided by GraphPad Software available on the Internet. A method derived from a procedure by Wilson was used to calculate the confidence interval for the percent reduction in gross premiums and the average loss ratio percent. The data for participation rates, attitude, and behavior change were analyzed using descriptive statistics.

**Results**

**Participant Level.**—Participation rates for the CME modules and the Risk-Management Rounds regarding fundamentals of risk-management knowledge were

<table>
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<th>Table 1.—Strategic Steps to Develop a Risk Management Program</th>
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<td>Insure a practice-wide commitment to the program</td>
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<td>Establish a Risk Management Committee (RMC) to oversee the program</td>
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<td>Develop a broad-based multidisciplinary committee</td>
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<td>Develop a reporting structure requiring the RMC to report to the senior executive leadership of the practice</td>
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<td>Create an economic incentive for participation in the program</td>
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<td>Identify high-exposure areas</td>
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<td>Design and implement an educational program for providers and practice managers</td>
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<td>Implement a case-based educational initiative provided by physicians and attorneys</td>
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<td>Implement a second educational session to reinforce the program’s themes</td>
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<td>Collect, analyze and evaluate data and disseminate results</td>
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98.7% (95% CI, 95.1%–99.9%) or greater for the years since their inception in 2004. These rates exceeded the 90% criterion. Participation rates for the focused education in the high-exposure areas were 100% (95% CI, 97.0%–100%) for each year exceeding the target of 75%.

Regarding the responses to the questionnaire to assess clinicians’ attitudes about the perceived value of the Risk-Management Rounds© for each policy year from 2004–2005 through policy year 2010 to 2011 between 94.4% (95% CI, 90.2%–97.9%) and 99.0% (95% CI, 96.1%–100%) of the responding clinicians, indicated that the education was worth their time. Similarly, for each year of the Risk-Management Rounds©, between 96.8% (95% CI, 93.1%–98.7%) and 100% (95% CI, 95.7%–100%) of the clinicians said the rounds were relevant to their practice and between 92.3% (95% CI, 87.6%–95.3%) and 97.8% (95% CI, 94.3%–99.3%) indicated the presentation should be offered annually. In response to whether or not the risk-management interventions presented could be implemented in their practice, for the same years between 80.8% (95% CI, 74.5%–85.8%) and 96.4% (95% CI, 92.1%–98.5%) of the responding clinicians believed that they could be. Regarding intended behavior change, between 93.3% (95% CI, 88.8%–96.1%) and 99.5% (95% CI, 96.9%–100%) of the respondents indicated that they would somewhat to completely change their practice as a result of what was learned. Regarding actual behavior change, the yearly audits begun in 2006 found that between 98.8% (95% CI, 95.4%–100%) and 100% (95% CI, 97.6%–100%) of the clinicians successfully met the audit criteria for follow-up and tracking of high-exposure areas of colorectal screening, pediatric depression and telephone communication. The 2007 risk-assessment conducted by ProHealth Physician’s insurance carrier that was a repeat of the 2002 independently conducted assessment, indicated that physicians’ scores for telephone documentation, tracking and follow-up, and medical record documentation improved by 15.4% (95% CI, 8.9%–25.2%), 20.6% (95% CI, 12.8%–31.3%) and 15.8% (95% CI, 9.4%–25.4%) respectively.

**Organizational Level.**—Pre- and postassessment comparing the number of claims for the six years before the risk-management program to the number of claims for the eight years after its implementation, revealed that there was a 63.8% reduction in the average number of all claims. The mean number of all claims for 1997 to 2003 was 10.00 ± 3.46 and the mean number of all claims in the years 2003 to 2011 after the risk-management program was introduced was 3.62 ± 2.13. This mean difference of 6.38 was statistically significant (95% CI, 3.12–9.63; \( P = .001 \)). Fig. 1 illustrates the number of all claims for each policy year before and after the implementation of the risk-management program. Regarding claims related to failure to diagnose or treat, during the policy years 1997–2003 there was an average of 5.83 ± 1.94 claims per year against the physicians in the group. After implementation of the risk-management program during the policy years 2003 to 2011, the average number of claims for failure to diagnose or treat was significantly fewer at 1.88 ± 1.64 claims per year. This is a mean differ-

![Figure 1.—Number of Malpractice Claims / Suits per Year before and After the Risk-Management Program.](image-url)
ence of 3.96 (95% CI, 1.87–6.04. P = .001) and represents a 67.9% reduction. It is important to note that the policy years 2009–2010 and 2010–2011 are considered immature; there is a potential for claims to still be reported for these two policy years.

These reductions in malpractice claims resulted in dramatically lower premiums. Since 2005, gross premiums for the physician group are down 59.7% (95% CI, 59.0%–60.4%) for the specialties of internal medicine/family practice and pediatrics (Fig. 2) and the insurance carrier has identified the group as having the lowest premiums offered in Connecticut for similar specialties. The pure insurance loss ratio (total paid claims and reserves and expenses divided by total premium for a policy year) decreased from a high of 347% ($5,418,675/$1,560,754) in policy year 2002–2003 to 9.6% ($254,392/2,637,810) in 2008–2009. The average loss ratio from policy years 2003–2004 to 2008–2009 was 47.17% ($7,539,185/$15,983,225, 95% CI, 47.15%–47.19%) (Fig. 3). Data for policy years 2009–2010 and 2010–2011 are too immature for calculation of the pure insurance loss ratio at this time.

Over $1.2 million in premium dividends have been returned to the company (Fig. 4). Premium dividend return is only considered for incidents that have expired based upon the statute of limitations in Connecticut which requires that suits be brought within two years from the date of injury or discovery although there are some circumstances for which it can be extended.12

**Comment**

Comparison of the number of malpractice claims for adverse events for inpatient vs outpatient settings recorded in the National Practitioner Data Bank for the years 2005 to 2009 reveals that the two settings had a similar number of paid claims.7 In the outpatient setting, close to $1.3 billion was paid for adverse events in 2009.7 This finding demonstrates that although more attention has been given to reducing risk-in the inpatient setting, risk-management in the outpatient setting is also critical. As opposed to the inpatient setting where surgical mishaps account for the greatest number of claims, diagnostic related events account for most claims in the outpatient setting.6,7 This has been the finding with the physician group we studied; failure to diagnose was the greatest exposure risk.

The risk-management experience we described demonstrates the results and benefits of changing behavior and creating a culture of safety. The change in culture begins, and is effective, when continually grounded in a strong commitment to patient safety.13 Commitment enforces accountability.14 It ensures constant attention to risk-assessment and to the necessary multifaceted strategies and best practices that improve patient safety.13 Comprehensive risk-management requires numerous, thoughtful, and integrated strategies to mitigate the many sources of risk.13
From a provider’s point of view, a culture of safety gives physicians a sense of control over the threats of malpractice and encourages them to understand they are providing the best possible care. Quality of care is known to correlate with medical malpractice outcomes.\textsuperscript{15} Risk-management may lead physicians to practice less defensive medicine; doing so will decrease a significant source of financial waste in health care.\textsuperscript{4,16} Regarding the process of behavior change, risk-management education is successful because it is a multimodality program that incorporates proven strategies with the greatest impact. Research has shown that clinician directed audits, feedback and continuing medical education using interactive small-group case discussions, similar to Risk-Management Rounds\textsuperscript{5} are some of the most effective strategies for improving quality and safety.\textsuperscript{17}
Education regarding risk-management has also been appreciated by faculty in graduate medical education. In 2008, the medical residency programs at the University of Connecticut collaborated with MRM to implement a risk-management curriculum. In the first year of the curriculum, education about the informed consent process and medical record documentation was presented. Evaluation of the residents' knowledge in these areas revealed significant improvement from pre- to posteducation, \( P < .001 \). The majority of the residents expressed positive opinions regarding the risk-management curriculum and their intention to implement risk-management interventions. This experience demonstrates that the curriculum and teaching strategies used for attending physician groups can be adapted for residents and perhaps medical students. Risk-management education for medical students may be especially worthwhile as it seems reasonable that starting a culture of safety cannot happen too soon. With effective formative education, it is likely that learners will begin to use and maintain practices that automatically incorporate the elements of risk-management. An effective risk-management curriculum should instill the necessary knowledge, attitudes, and behaviors for career-long proactive risk-management.

We have demonstrated that a strong commitment to the implementation of a comprehensive risk-management program can result in fewer claims and substantial cost savings. A culture of safety becomes even more important in this era of health-care reform as increased access to care could lead to significantly more malpractice claims and litigation that could overwhelm hospitals, physician practice groups and perhaps the entire health-care system. Achieving patient safety is the right thing to do based upon moral principles. It is also the right thing to do based upon economic principles. A strong business case for patient safety exists and is founded on the notion that safety promotes efficiency and cost containment. Safety is good for patients, good for physicians, and good for business.

**Author Contributions**

Mr. Kelly had full access to all data in the study and takes responsibility for the integrity of the work from inception to publication.

Study concept and design: Kelly, Cox-Chapman

Acquisition of data: Kelly, Cox-Chapman

Analysis and interpretation of data: Kelly, Jacobs, Burns

Drafting of the manuscript: Jacobs, Burns, Kelly

Critical revision of the manuscript for important intellectual content: Jacobs, Burns, Cox-Chapman, Kelly

Final approval: Jacobs, Burns, Cox-Chapman, Kelly

**Disclosures:** Dr. Cox-Chapman is Chief Medical Officer of ProHealth Physicians. He owns ProHealth stock and has exercised stock options in the last 36 months. Mr. Kelly is President of Medical Risk-Management (MRM) LLC. MRM was the risk-management consulting firm that ProHealth Physicians commissioned to assist in the implementation of the risk-management program. Dr. Jacobs and Dr. Burns have no potential conflicts to report.

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**REFERENCES**


