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JOURNAL OF MEDICAL LICENSURE AND DISCIPLINE

Published Continuously Since 1915
Volume 95, Number 1, Winter 2009

The Journal of Medical Licensure and Discipline (ISSN 1547-48IX, publication number 189-120) is published quarterly by the Federation of State Medical Boards of the United States Inc., P.O. Box 619850, Dallas, TX 75261-9850
Telephone: (817) 868-4000
Fax: (817) 868-4098

Postmaster
Send address changes to the *Journal of Medical Licensure and Discipline*, P.O. Box 619850 Dallas, TX 75261-9850

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"How far you go in life depends on your being tender with the young, compassionate with the aged, sympathetic with the striving, and tolerant of the weak and strong. Because some day in life you will have been all of these."

— *George Washington Carver*

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MESSAGE FROM THE CHAIR

PLANTING SEEDS OF EXCELLENCE

Regina M. Benjamin, MD, MBA, Chair, Federation of State Medical Boards

During the past year the FSMB has continually demonstrated its ability to remain focused on its mission by providing leadership for a number of initiatives, programs, and products that support our membership. In the years to come we must work diligently to ensure that our organization continues to meet the needs of our member boards.

A primary focus during the past year has been the ongoing integration of the FSMB's business functions and the optimization of our organization's business units. We termed this our Enterprise Project and it involves all aspects of the organization. These efforts are necessary to ensure that the FSMB continues to thrive in a rapidly changing health care climate — even as the United States economy continues to struggle. But despite the current economic challenges, the FSMB has been able forge ahead on key initiatives, expand its education offerings and increase its international visibility. A few of these programs and projects merit mention:

FSMB Special Committee for Strategic Positioning. I formed this important committee and charged it with the critical mission of identifying possible areas of modification of our current strategic plan. It is also charged with developing new strategic recommendations that will position the FSMB to best support the future needs of the medical regulatory community and to position the FSMB as the leader in medical regulation. We recently sent a survey to the state boards and external stakeholders, asking them what they see as the FSMB's strengths and opportunities, and how we should position the FSMB to best accomplish our mission and goals.

CEO Search Committee. With the acceptance of the resignation of James N. Thompson, M.D., F.A.C.S., we had to move quickly to hire an interim President and CEO. Since January, Barbara S. Schneidman, M.D., M.P.H., has been exceptional in that position. The FSMB Board of Directors did a heroic job during this period of transition. We established a stellar search committee that has been hard at work to find a permanent CEO.

FSMB Foundation. The new FSMB Foundation (formerly the FSMB Education and Research Foundation) will actively make financial grants for education and research projects that support the work of our medical boards. Although state medical boards often are not eligible, and do not have the resources, to compete for outside grant funds, the FSMB Foundation, as a 501(c)(3) organization, can compete for these funds and, when appropriate, direct them back to our state medical boards in the form of grants that address education and research needs. In April 2006, the FSMB Foundation was awarded a grant to develop online physician education. The Online Prescriber Education Network (OPEN) portal now offers 32 available educational courses, and it is anticipated that a minimum of 40 courses will eventually be available.

Responsible Opioid Prescribing: A Physician's Guide. The FSMB Foundation developed a remarkable little book, *Responsible Opioid Prescribing: A Physician's Guide*. It was written by pain specialist Scott M. Fishman, M.D. It translates the FSMB's *Model Policy for the Use of Controlled Substances for the Treatment of Pain* into pragmatic implementation strategies for risk reduction of addiction, abuse and diversion, patient education and monitoring. With assistance from state medical boards more than 60,000 books have been distributed to physicians. In February 2009 the book received CME accreditation, and now offers up to 7.25 *AMA PRA Category 1 Credits*™ for reading the book and completing an online post-test.

Federation Physician Data Center (FPDC). Searches performed through the FPDC on behalf of state medi-

cal boards increased in 2008 by approximately 16.5 percent, and the number of total searches increased by 6.3 percent. This year we have added to the clearance reports (no disciplinary history), the licensure history of the physician or physician assistant, as reported by their state medical board. With the outstanding support of the member boards, the FSMB is expanding its physician database to include biographical, educational and licensure information on all physicians licensed to practice medicine in the United States.

Federation Credentials Verification Service (FCVS). In February 2009, FCVS received its 100,000th physician applicant, and to date FCVS is the official agent of record for 31 residency programs and is increasing each year. The NCQA has formally acknowledged FCVS as the recognized source for closed residency programs which have an agreement with FCVS. Recent enhancements have resulted in a 15 percent decrease in the time to process a physician's credentials profile. To date, 63 state medical boards accept the FCVS Profile as primary source verification for a physician's, and 31 for physician assistant's core credentials.

Trusted Agent and the Uniform Application for Physician State Licensure (UA). The FSMB continues to make positive strides in improving license portability, and our efforts remain focused on facilitating greater mobility for physicians while, at the same time, we ensuring the highest standards for physician licensure. The Trusted Agent platform is a collaborative joint venture between FSMB and NBME. It is a remarkable improvement in license portability, providing a flexible infrastructure enabling medical professionals to request data compilations in real time. This is done via web applications that are programmed to satisfy specific requirements of a particular credential service, such as applying for state licensure. The UA authenticates using All Licensed Physicians data and has the option of auto populating information from FCVS. As of March 12, 2009, a total of 8,000 physicians have successfully been authenticated to use the UA, and more than 7,300 additional physicians have submitted UA applications.

Travel. I accepted invitations on behalf of the FSMB, to speak at or attend a number of national and international events. These events gave me the opportunity to increase the FSMB's international presence and promote our mission around the world. Some examples include:

- giving a keynote address at the American Association of Physicians of Indian Origin (AAPI) in Las Vegas, Nev., where I centered my comments on the FSMB's efforts to promote license portability and improve uniformity of licensing requirements;
- Representing the FSMB at the inaugural First World Health Professions Conference on Regulation in Geneva, Switzerland, sponsored by the World Health Professions Alliance in collaboration with the World Confederation for Physical Therapy;
- Chairing a session at the International Association of Medical Regulatory Authorities (IAMRA) International Conference on Medical Regulation hosted by the Health Professions Council of South Africa in Cape Town, South Africa;
- Presenting on pharmaceutical financial support, at the American Osteopathic Association (AOA) Advocacy for Healthy Partnerships (AHP) Program in Las Vegas, Nev.;
- Delivering a luncheon address to the American Association of Osteopathic Examiners (AAOE) on the FSMB's major initiatives at the AAOE's 2009 Summit Meeting in New Orleans; and
- Addressing approximately 200 physician assistant leaders from across the country at the American Academy of Physician Assistants (AAPA) Constituent Organization Resource Exchange conference in Arlington, Va.
- Attending meetings of the American Medical Association (AMA), Association of American Medical Colleges (AAMC), American Academy of Family Physicians (AAFP), Medical Association of the State of Alabama (MASA), Educational Commission for Foreign Medical Graduates (ECMFG), National Board of Medical Examiners (NBME), National Board of Osteopathic Medical Examiners (NBOME), the USMLE Composite Committee Retreat, two summits of the Physician Accountability for Physician Competence (PAPC), and visiting many of our state medical boards.

In summary, it has been a wonderfully productive year. I have had the pleasure of working with and for so many individuals (State Medical Boards, FSMB Directors, Staff) who are dedicated to public service, medical licensure and discipline. But most of all, you are dedicated to the patients we serve.

During my term as FSMB Chair I have tried to plant some seeds of excellence, which I hope will continue to grow well beyond my tenure. It has truly been a privilege to serve as your Chair.

EDITORIAL

DETECTION, REHABILITATION AND COMMUNICATION ARE ESSENTIAL COMPONENTS OF PATIENT SAFETY

Lance A. Talmage, M.D.

The State Medical Board of Ohio has a mission to protect the public. One of our goals is to rehabilitate the licensees when possible. We have a deep concern about our physician members who are in probationary status in a substance abuse diversion program. Oftentimes these physician members are restricted from taking recertification boards, are excluded from insurance products and are being charged higher insurance premiums. During multiple meetings of medical specialty groups, the Federation of State Medical Boards and the American Medical Association, there is emerging a greater understanding of these problems. It is important for medical boards to contact specialty societies within their state and nationally to provide more enlightenment as to the extent of this problem and to encourage the societies to continue to work on solutions.

Medical boards that have diversion programs, in which impaired individuals are being monitored for relapse, may make those licensees the safest practitioners we have. Relapse detection will get the probationer out of practice and ensure patient safety. People who are not monitored and may have a hidden substance abuse problem could be more danger to their patients than those who have been discovered and who are on probation. Statistically we know 10 percent of people have alcohol abuse problems. We typically have only one percent of our licensees on a probationary status, while some others have self-identified or are ex-probationers maintaining their sobriety. It is our experience that 80 percent of our clients are successful in maintaining sobriety or abstinence from drugs once in our probation program. In addition, some physicians may have psychiatric difficulties that are under surveillance by the board and also are on probation. These individuals usually maintain their drugs better and are obligated to have psychiatric counseling and care on a regular basis to ensure they are well monitored. It is these physicians and such other practitioners as P.A.s, anesthesia assistants and other licensees who are quite capable of going back into the job market and taking good care of their patients.

The economic and public benefits of rehabilitation are obvious in a time when physician supply is marginal. The key is ensuring good screening and continued compliance. We must maintain the confidence of the public and interested organizations that we can and do monitor our clients as well as possible. If physicians are restricted from taking their specialty recertification exams or cannot get into an insurance panel, it is our experience they may accept jobs in clinics that are known pill mills or align themselves with clinics or other jobs that are beneath their professional capabilities. Maintaining the dignity, pride and self-esteem of these practitioners is essential to their continued recovery. It is incumbent upon medical boards and those specialists within their boards to contact their specialty societies to encourage them to continue the process they have begun. Hopefully they can modify their policies so we can restore these practitioners to the practice they are capable of maintaining. Working with both the malpractice and the medical benefit insurers/payers also is an essential next step in allowing our board licensees the ability to practice once they have acknowledged and are dealing with their psychiatric or substance abuse problems. The boards in turn must ensure their relapse detection and reaction is credible. Probationary agreements must be prescriptive to ensure surveillance will protect patients and encourage rehabilitation. Our next goal is to make sure we get *all* physicians who need it into a good diversion and probationary program.

AFFILIATIONS

Lance A. Talmage, M.D., is a member of the FSMB board of directors and a former member of the FSMB Editorial Committee.

CHARACTERISTICS OF PHYSICIAN RELOCATION FOLLOWING HURRICANE KATRINA

Kusuma Madamala, Ph.D., M.P.H., Claudia R. Campbell, Ph.D., Edbert B. Hsu, M.D., M.P.H., Yu-Hsiang Hsieh, Ph.D, M.Sc., James James, M.D., Dr.P.H., M.H.A.

ABSTRACT

Introduction: **On Aug. 29, 2005, Hurricane Katrina made landfall along the Gulf Coast of the United States, resulting in the evacuation of more than 1.5 million people, including nearly 6000 physicians. This article examines the relocation patterns of physicians following the storm, determines the impact that the disaster had on their lives and practices, and identifies lessons learned.**

Methods: **An Internet-based survey was conducted among licensed physicians reporting addresses within Federal Emergency Management Agency-designated disaster zones in Louisiana and Mississippi. Descriptive data analysis was used to describe respondent characteristics. Multivariate logistic regression was performed to identify the factors associated with physician nonreturn to original practice. For those remaining relocated out of state, bivariate analysis with x^2 or Fisher exact test was used to determine factors associated with plans to return to original practice.**

Results: **A total of 312 eligible responses were collected. Among disaster zone respondents, 85.6 percent lived in Louisiana and 14.4 percent resided in Mississippi before the hurricane struck. By spring 2006, 75.6 percent (n = 236) of the respondents had returned to their original homes, whereas 24.4 percent (n = 76) remained displaced. Factors associated with nonreturn to original employment included family or general medicine practice (OR 0.42, 95 percent CI 0.17–1.04; $P = .059$) and severe or complete damage to the workplace (OR 0.24, 95 percent CI 0.13–0.42; $P < .001$).**

Conclusions: **A sizeable proportion of physicians remain displaced after Hurricane Katrina, along with a lasting decrease in the number of physicians serving in the areas affected by the disaster. Programs designed to address identified physician needs in the aftermath of the storm may give confidence to displaced physicians to return.**

On Aug. 29, 2005 Hurricane Katrina made landfall along the U.S. Gulf Coast, leaving devastation in its wake. At least 1,808 deaths were attributed to the storm and subsequent flooding in Louisiana and Mississippi.[1] With total damage estimates exceeding US$100 billion, Hurricane Katrina emerged as the costliest natural disaster in United States history.[2] The scale of societal impact was likewise unprecedented, with more than 1.5 million people requiring evacuation.[1] Nearly two years after the storm, more than 200,000 residents remain displaced from their homes in the hardest-hit areas.[3]

In the aftermath of Hurricane Katrina, health care infrastructure and services sustained extensive disruption. Flooding in New Orleans forced a temporary shutdown of health care delivery in several parishes and led to the displacement of many local physicians from the region. By autumn 2005 nearly 6,000 physicians had been displaced from the Gulf region by Hurricane Katrina. Louisiana was most severely affected; among displaced physicians, 4,486 had formerly practiced in three New Orleans parishes (Orleans, Plaquemines and St. Bernard).[4] According to Government Accountability Office statistics, only three of the nine hospitals in Orleans Parish had reopened by February 2006, with a total bed capacity reduced to approximately 20 percent of that before the storm.[5] Among the state's largest public hospitals, Charity Hospital still remains closed, whereas University Hospital reopened in November 2006 with limited capacity.

A major aspect of health care system recovery relates to whether displaced physicians have returned, intend to return, or have permanently relocated their practice. Such decisions are likely to have a direct and profound effect

on the long-term reconstitution of regional health care systems in the Gulf region; however, trends of physician displacement following Hurricane Katrina have not been reported in detail. The present study sought to investigate whether Hurricane Katrina has resulted in a significant loss of practicing physicians from disaster-stricken regions of the Gulf Coast. The authors examine the relocation patterns of local physicians following Hurricane Katrina, determine how the disaster affected their lives and practice, and identify lessons learned that can guide health care recovery efforts in future events.

METHODS

Survey Design

A descriptive Internet-based survey was developed to investigate physician demographics and relocation patterns following Hurricane Katrina. The survey was jointly designed by the study team at the American Medical Association (AMA) Center for Public Health Preparedness and Disaster Response and the Tulane University School of Public Health & Tropical Medicine. A total of 46 questions addressed physician demographics, the magnitude of the storm's impact on personal and professional lives, and relocation status. Relocation was defined as residing at a different location from that before Hurricane Katrina. As part of the design process, the form and content of the survey were reviewed by board members of the Louisiana State Medical Society. Pilot testing was conducted with selected local physicians.

Selection of Study Participants

Survey participants were identified and selected from an AMA master file of all of the licensed physicians reporting addresses located within Federal Emergency Management Agency (FEMA)-designated disaster zones in Louisiana and Mississippi before August 2005. Corresponding e-mail addresses for potential survey participants were obtained from the 2006 Record of Physician Professional Activities. Physicians residing outside FEMA-designated disaster zones before the hurricane, those without a listed e-mail address, and those for whom the listed e-mail address was undeliverable were excluded from the study.

Survey Administration

The survey was administered online by the AMA during spring 2006. Eligible participants were sent introductory letters via e-mail describing the purpose of the study with a link to the Internet-based survey. The survey was accessible during the period March 9, 2006-July 10, 2006. To enhance the response rate, announcements of the study and survey availability were made on local, state, and national medical society listservs and local medical society newsletters.

To verify that potential respondents met study criteria, entry of a pre-Katrina home ZIP code from participating physicians was required. ZIP code entries were automatically screened by the program so that the questionnaire could be accessed only when the ZIP code entered by a respondent matched a FEMA-designated disaster zone. For physicians requiring further assistance or clarification, a telephone number directing respondents to contact the study coordinators was provided on the website.

Data Analysis

Descriptive data analysis was used to describe characteristics of respondents by calculating the proportions for categorical variables. Multivariate logistic regression was performed to identify the factors associated with physician nonreturn to original practice. For those remaining relocated out of state at the time of the survey, bivariate analysis using x^2 or Fisher exact test was performed to determine factors associated with plans to return to original practice. $P < .05$ was considered statistically significant. SAS version 9.1 (SAS Institute, Cary, NC) was used to perform all of the data analyses.

RESULTS

Based on reported ZIP codes, the AMA master file identified 5854 physicians (AMA members and nonmembers) who resided in the FEMA-designated disaster zones before August 2005. E-mail addresses were obtained for a total of 1266 (21.6 percent) of the identified physicians, of which 976 (77.0 percent) were active and 290 (23.0 percent) were returned as undeliverable. A total of 312 eligible responses were collected, yielding a response rate of 32.0 percent from contacted physicians who originally resided in the areas of interest, which represented 5.3 percent of the total affected physician population. A comparison of respondents versus nonrespondents revealed no statistically significant differences based on sex, specialty, board certification, AMA membership or other identifiable characteristics, apart from age (86.6 percent respondents >40 years old vs 79.6 percent nonrespondents >40 years old).

Demographics

Among disaster zone respondents, 85.6 percent lived in Louisiana and 14.4 percent resided in Mississippi before Hurricane Katrina (Table 1). Approximately 80 percent of the physicians were men; a similar percentage reported being married, and 47.1 percent had children <18 years

Table 1.

Sociodemographic Characteristics of Respondents (n = 312)			
Characteristic	**n (%)**	**Characteristic**	**n (%)**
Sex		State of residence	
Male	248 (79.5)	Louisiana	267 (85.6)
Female	64 (20.5)	Mississippi	45 (14.4)
Marital Status		Years practiced in state	
Married	251 (80.5)	<10	89 (28.5)
Single	27 (8.7)	11-20	92 (29.5)
Divorced	20 (6.4)	>20	118 (37.8)
Partnered	10 (3.2)	Retired	7 (2.2)
Widowed	4 (1.3)	Unknown	6 (1.9)
Age, y		Total years in practice	
30-39	47 (15.1)	<10	58 (8.6)
40-49	77 (24.7)	11-20	80 (25.6)
50-59	112 (35.9)	>20	163 (52.2)
60	76 (24.4)	Retired	6 (1.9)
Children (<18 y) in home		Unknown	5 (1.6)
Yes	147 (41.1)	Specialty	
No	164 (52.6)	Family/general medicine	26 (8.3)
Unknown	1 (0.3)	Other	286 (91.7)

old living at home. Physicians ages 50 to 59 comprised the largest age group. More than half of all of the respondents had >20 years of medical experience. At least 67.3 percent had practiced in-state for >10 years, with 37.8 percent practicing in-state for >20 years. By specialty, 8.3 percent of all respondents designated themselves as family practice or general medicine practitioners.

Relocation Status

By spring 2006, 75.6 percent (n = 236) of the respondents had returned to their original homes, whereas 24.4 percent (n = 76) reported a different place of residence (Table 2). Of those who remained displaced from their homes, 39.5 percent (n = 30) had temporarily relocated to another home within the same state, 19.7 percent (n = 15) had permanently relocated to another "... programs to address identified physician needs in the aftermath of the storm may give confidence to displaced physicians to return" home in the same state, 27.6 percent (n = 21) had temporarily relocated out of state, and 13.2 percent (n = 10) had permanently relocated out of state. At the time of the survey, 40.7 percent (n = 127) of physicians reported that the hospital with which they were primarily affiliated was closed as a result of the hurricane. Hospital closures disproportionately affected physicians who remained displaced ($P = .058$). For 19.6 percent (n = 61) of physicians who required new hospital privileges, the process ranged from "very easy" (29.5 percent), "easy" (34.4 percent), "difficult" (14.8 percent), to "very difficult" (19.7 percent). Physicians relocated out of state were significantly more likely than those who had returned home to characterize the process of acquiring new hospital privileges as "very difficult" ($P = .017$).

Table 2.

Relocation Status of Survey Respondents (n 312)	
Post-Katrina Residence	**n (%)**
Returned to home	236 (75.6)
Different place of residence	76 (24.4)
Temporarily relocated in same state	30 (9.6)
Permanently relocated in same state	15 (4.8)
Temporarily relocated out of state	21 (6.7)
Permanently relocated out of state	10 (3.2)

Reported Damage

Reported damages to homes and workplaces are shown in Table 3. Virtually all of the physicians surveyed reported some level of damage to their homes, with 37.1 percent citing damages ranging from $10,000 to $50,000 and 39.7 percent reporting damages in excess of $50,000. At the workplace, most physicians sustained damages ranging from minimal to severe, with 45.2 percent citing business losses in excess of $50,000.

Decision to Return

At the time of the survey, 24.4 percent (n = 76) of the respondents remained displaced. Of the physicians who had temporarily or permanently relocated either in-state or out of state, 90.8 percent reported continuing to practice medicine. For all of the respondents, factors associated

Table 3.

Damage to Home and Workplace	
Characteristics	**n (%)**
Damage to home	
Level of damage to home	
No damage	17 (5.5)
Minimal damage	176 (56.4)
Severe damage	97 (31.1)
Complete destruction	22 (7.1)
Estimated personal property losses	
<$1000	7 (2.2)
$1000–$4999	23 (7.4)
$5000–$9999 39 (12.5)	39 (12.5)
$10,000–$50,000 99 (31.7)	99 (31.7)
>$50,000 124 (39.7)	124 (39.7)
Don't know 20 (6.4)	20 (6.4)
Damage to workplace	
Level of damage to workplace	
No damage 30 (9.6)	30 (9.6)
Minimal damage 153 (49.1)	153 (49.1)
Severe damage 103 (33.0)	103 (33.0)
Complete destruction 26 (8.3)	26 (8.3)
Estimated business losses	
<$1000 15 (4.8)	15 (4.8)
$1000–$4999 6 (1.9)	6 (1.9)
$5000–$9999 17 (5.4)	17 (5.4)
$10,000–$50,000 64 (20.5)	64 (20.5)
>$50,000 141 (45.2)	141 (45.2)
Don't know 69 (22.1)	69 (22.1)
Damage to building 269 (86.2)	269 (86.2)
Damage to medical records 88 (28.2)	88 (28.2)
Damage to medical equipment 129 (41.3)	129 (41.3)
Damage to medical supplies 133 (42.6)	133 (42.6)
Damage to office equipment 135 (43.3)	135 (43.3)
Damage to office supplies 126 (40.4)	126 (40.4)

with nonreturn to original employment included family or general medicine practice (odds ratio [OR] 0.42, 95 percent confidence interval [CI] 0.17– 1.04; *P*= .059) and severe or complete damage to the workplace (OR 0.24, 95 percent CI 0.13–0.42; *P* < .001) (Table 4).

Among physicians remaining displaced from their home state (n = 31), 41.9 percent planned to return to their original practice location, 32.3 percent did not plan to return, and 25.8 percent remained uncertain regarding future plans. In this group, physicians who were female (*P* < .01), <40 years of age (*P* = .058), and had practiced <10 years in state (*P* = .032) were found to be significantly less likely to return to their original practice.

Requested Assistance Priorities of Displaced Physicians

The priorities identified by respondents included financial assistance/grants to rebuild their practice (15.7 percent), financial assistance to rebuild their home (14.7 percent), information or assistance in obtaining staff for their practice (9.3 percent), assistance in finding employment (5.1 percent), information or assistance with obtaining a new medical license (4.8 percent), assistance with damaged medical records (3.8 percent), assistance communicating their current practice situation to their former patients (1.9 percent), and information about or assistance with obtaining medical liability insurance (1.3 percent).

Table 4.

Factors Associated With Nonreturn to Original Practice		
Categories	**ORs (95% CI)**	***P***
Specialty		
Family/general medicine	0.42 (0.17–1.04)	.059
Others	1.00	
Damage to workplace		
Severe or complete	0.24 (0.13–0.42)	<.001
None or minimal 1.00	1.00	

DISCUSSION

Although a large number of Gulf Coast physicians have returned to the region, the deep impact of Hurricane Katrina on the local health care systems spawned by physical damage, physician relocation, and disruption of medical services is still being felt. Most displaced physicians were from Louisiana (85.6 percent), with a smaller segment from Mississippi (14.4 percent). Approximately 25 percent of all physician respondents indicated that they remained displaced at the time of the survey, >6 months after the hurricane. Nearly 10 percent remained out of state, with the preponderance of this group indicating that they were either unlikely to or uncertain about returning to their original practice. These findings of marked physician displacement and attrition in the hurricane-stricken Gulf Coast region are supported by other reports. As of July 2006 Blue Cross Blue Shield reported the number of physicians filing claims in the affected parishes in New Orleans as having been reduced to 48 percent of pre-Katrina levels, down from 3091 to 1502.6 In this study family and general medicine practice were found to be associated with nonreturn to original employment. These findings may support the contention that primary care services in disaster areas have been disproportionately affected. In Louisiana a State Board of Medical Examiners review found that the number of board-licensed primary care physicians in New Orleans fell by 28 percent, from 2,645 to 1,913 during the period August 2005–July 2006.[7]

Among physicians remaining displaced out of state, female

physicians, younger practitioners and those who had practiced in-state for a few number of years appear less likely to return or express less certainty about returning to their original practice. The absence of key support sources, such as childcare services or extended family, in the disaster stricken areas may have contributed to a disinclination to return.

Physicians as a group sustained considerable personal and business-related financial losses. As expected, physicians whose homes were significantly damaged or destroyed were far more likely to be displaced at the time of the survey. Approximately 24 percent of those still relocated six months after the disaster reported complete destruction of their homes, and nearly 40 percent of this same group reported personal losses >$50,000. Interestingly, severe or complete damage to homes was not associated with nonreturn to original employment; however, physicians who had not returned were significantly more likely to report severe or complete damage to their workplace. Academic hospital centers were not spared. In January 2006 approximately 180 faculty were laid off from Tulane Medical School.[8] In December 2006 Louisiana State University Health Science Center laid off 127 medical school faculty.[9] As expected, hospital closures and downsizing had a major effect on local physicians.

This study has several important limitations. Attempts to trace displaced physicians in the aftermath of the storm presented a unique challenge. Given post-Katrina conditions, the study design team believed that an online survey would yield higher response rates than other data collection methods (eg., mail or telephone surveys). The total number of physician respondents represents a relatively small, although important cross-sectional sample of those affected by Hurricane Katrina (5.3 percent). Other physicians who may have been affected may not have been captured in the survey, such as those who lived outside but worked in designated FEMA disaster zones.

Although e-mail contact information was available for roughly only one in five physicians, no clear characteristics distinguished physicians who had provided this information to professional societies from those who had not. Reasons for nonparticipation may include expired records, disrupted Internet service, or insufficient time or interest on the part of those surveyed. Nonresponse bias is unlikely to affect the general conclusions of this study because an analysis of respondents and nonrespondents revealed only a modest difference in average age. Of note, this study probably underestimates overall relocation rates because physicians with undeliverable e-mail addresses and those who did not respond to the survey are more likely to have remained displaced. Estimates of reported damage to homes and workplaces are subjective and were not quantified. Physicians who were part of large practice groups or served on hospital staff would not necessarily be expected to reliably estimate workplace damages.

The principal importance of the findings is the cascade effect on health system recovery for every physician who opts not to return to his or her original practice. Patients requiring health care services are forced to seek care from a smaller pool of local providers and primary care practitioners, whereas other health care personnel originally employed by private practices that shut down must also relocate. Even the return of physicians to their original practice does not guarantee the complete restoration of medical services to pre-Katrina levels.

Reports of the personal and professional experiences of physicians affected by Hurricane Katrina offer some insights into the specific recovery needs of health care personnel. Many physicians reported obstacles such as strained living conditions, loss of housing, or difficulties with travel. Others cited numerous operational challenges including the relocation of former practice partners, shortage of cash to maintain operations, difficulty in retaining staff, and burden of treating increasing numbers of uninsured patients.

Several strategies that may facilitate the return of displaced physicians following future natural disasters are suggested by these findings. One of the highest priorities identified by respondents was financial assistance to rebuild their practices. Because severe or complete damage to the workplace was associated with nonreturn, strong financial support incentives must be quickly established to promote the return of practicing physicians. For instance, consideration should be given to policies and programs that would provide immediate low interest loans or grants for rebuilding physician practices. These measures would aid struggling practices and support the reestablishment of health care in heavily affected areas.

Second, a disproportionate loss of primary care providers, including family and general medicine practitioners from designated disaster areas, must be addressed. Although comparative displacement data for the general population in the designated disaster areas are not readily available for the study period, specific incentives to attract the return of primary care providers to return should be considered.

A number of studies point to sharp increases in the number of uninsured or those who had lost access to insurance records following the storm.[10] Along these lines, health care services for underserved populations should be prioritized to receive direct support to address the increased burden that uninsured patients impose on financially weakened medical practices. Programs that offer appropriate reimbursement to physicians for providing care to indigent and uninsured patients should be established as a standard protocol to assist in health care system recovery.

Third, the federal government has opened discussions regarding new grants and loans specifically earmarked for health and medical recovery, lack of access to the uncompensated care pool to those providing care, and bridge funding for health and medical staff salaries and operational costs with disaster-specific loans and grants.[11] Despite such measures, important financial constraints continue to impede the long-term health care system recovery. In response to future disasters, these types of initiatives must be expeditiously implemented.

In conclusion, this study identified a sizeable proportion of physicians who remain displaced following Hurricane Katrina as well as a lasting decrease in the number of physicians serving in the areas affected by the disaster. This, in turn, has broad implications for the long-term health care system recovery of the Gulf Coast. A comprehensive, regularly updated electronic contact list for physicians would assist representative organizations in monitoring physician relocation patterns, identifying information needs, and offering local support services to physicians. Although the plans elicited from respondents are subject to change based on many factors as the Gulf Coast recovery progresses, programs to address identified physician needs in the aftermath of the storm may give confidence to displaced physicians to return. Additional follow-up assessments may be useful in determining whether the identified patterns of physician relocation persist or change over time.

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ACKNOWLEDGMENTS

The authors thank Mindy Schneiderman, Ph.D., from the AMA for assistance in survey design and web-based implementation, and Sunny Chen and Dr. Gene Beyt, Department of Health Systems Management, Tulane University School of Public Health & Tropical Medicine, for review and revision of the survey.

Reprinted from *Disaster Medicine and Public Health Preparedness*. 2007;1:21–26.

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WHAT EXACTLY IS PATIENT SAFETY?

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ABSTRACT

We articulate an intellectual history and a definition, description and model of patient safety. We define patient safety as a discipline in the health care professions that applies safety science methods toward the goal of achieving a trustworthy system of health care delivery. We also define patient safety as an attribute of health care systems that minimizes the incidence and impact of adverse events and maximizes recovery from such events. Our description includes: why the field of patient safety exists (the high prevalence of avoidable adverse events); its nature; its essential focus of action (the microsystem); how patient safety works (e.g., high-reliability design, use of safety sciences, methods for causing change, including cultural change); and who its practitioners are (i.e., all health care workers, patients and advocates). Our simple and overarching model identifies four domains of patient safety (recipients of care, providers, therapeutics and methods) and the elements that fall within the domains. Eleven of these elements are described in this paper.

INTRODUCTION

A defining realization of the 1990s was that, despite all the known power of modern medicine to cure and ameliorate illness, hospitals were not safe places for healing. Instead, they were places fraught with risk of patient harm. One important response to this realization has been the growth of interest in patient safety. It is increasingly clear that patient safety has become a discipline, complete with an integrated body of knowledge and expertise, and that it has the potential to revolutionize health care, perhaps as radically as molecular biology once dramatically increased the therapeutic power in medicine.

Patient safety is now recognized in many countries, with global awareness fostered by the World Health Organization's World Alliance for Patient Safety. And yet there continue to be significant challenges to implementing patient safety policies and practices. One fundamental requirement for adopting any new approach is a clear articulation of its premises and manifestations. Components of patient safety have been expressed by thought leaders, and models have been presented. However, a single rendition that can help a thorough adoption of patient safety throughout health care has not been available. This paper aims to offer that. After introducing salient points in the intellectual history of patient safety, we offer a definition, a description, and finally, a model of patient safety. We call on organizations to adopt a definition and model for patient safety.

INTELLECTUAL HISTORY OF PATIENT SAFETY

Critical assumptions in health care were rewritten by patient safety thinking. How to understand why people make errors that lead to adverse events shifted from a single cause, legalistic framework to a systems engineering design framework, and in so doing, it changed forever the way people think about health care delivery.

Limiting Blame

The first quantum leap defined patient safety's entry into health care thought. The realization that adverse events often occur because of system breakdowns, not simply because of individual ineptitude prompted the change. The traditional approach assumed that well-trained, conscientious practitioners do not make errors. Traditional thinking equated error with incompetence and regarded punishment as both appropriate and effective in motivating individuals to be more careful.

The use of this kind of blame had a toxic effect. Practitioners rarely revealed mistakes, and patients and supervisors were frequently kept in the dark. Low reporting made learning from errors nearly impossible, and legal counsel often supported and encouraged this approach in order to

minimize the risk of malpractice litigation.[1] This mindset lent a wary, antagonistic backdrop to the therapeutic interaction.[2] It also created a locked-in paralysis for all concerned when failure did occur.

Thinking began to change in the 1990s in response to several kinds of new information. First, medical injury was acknowledged as occurring far more often than heretofore realized, with most of these injuries deemed preventable. Second was the idea that "active" errors at the "sharp end" — where practitioners interact with patients or equipment — result from "latent" errors, as demonstrated by James Reason.[3] Latent errors are upstream defects in the design of systems, organizations, management, training and equipment ("blunt end") that lead individuals at the sharp end to make mistakes. To punish individuals for such mistakes seemed to make little sense, since errors are bound to continue until underlying causes are remedied.

Systems Thinking

Thought leaders in health care offered persuasive arguments that errors could be reduced by redesigning systems and processes using human factors principles. These could reduce mistakes through design features, including standardization, simplification and the use of constraints. One such constraint is a "forcing function," which is a design characteristic that makes error impossible (e.g., incompatible connectors that prevent connecting an anesthetic gas to the oxygen port of an anesthesia machine).

Another corollary quantum leap to view health care as a system took place as people applied engineering design concepts to health care. Some of these systems changes were related to tools and technology, such as using better intravenous pumps or computerizing physician medication prescribing. Others were related to organizations and people, such as training doctors and nurses to work better in teams or including a pharmacist in the team during rounds. Some were more successful than others, but the important change was that people were thinking of health care delivery in terms of systems.

Interestingly, in earlier phases of medical history, different forms of systems thinking were dominant. However, these forms focused on the biologic systems within the individual patient, rather than on care and interactions between individuals in the environment of care. The notion of humors and the understanding of the circulatory system are two examples from the period prior to the modern scientific era. As the scientific era dawned and the field of medicine began applying the scientific method with success, systems thinking within physiology continued. Perhaps this was helpful, as clinicians took on a systems understanding of the delivery of health care as well.

Initially, perhaps, blunt-end factors were typically thought of as organizational policies and processes that shaped the behavior of individuals at the sharp end-point of service. However, an awareness also emerged of extra-organizational blunt-end factors, including regulators, payers, insurance administrators, economic policymakers and technology suppliers. These parties often influence and shape incentives and demands within the health care organization. Thus, health care had to be seen as an open, not closed, system, and policy too began to be thought of as a feature of the system.

Transparency and Learning

The idea that adverse events could yield information was not new, but as it was newly applied in health care, it acquired a new potency. The notion that sharing information about medical errors was essential for effective patient safety outcomes became urgent. Commentators asserted that the more error-related information was shared, the better lessons could be implemented industry-wide.[4] The possibility that knowledge of systems might require an understanding of how things go wrong was demanding attention.

Culture and Professionalism

Clinicians, governing boards, executive leaders and middle managers of health care delivery organizations were being increasingly encouraged to think in terms of building high-reliability organizations. This required a culture change to one that refrained from assigning "sharp-end" blame for mistakes; that incentivized learning by fully disclosing information about mistakes, failure and near misses; that trained and provided support to clinicians involved in inherently risky work; and that disclosed all relevant facts to injured parties.[5,6]

These transformations in thinking resulted in approaches that were remarkably well-rooted in the essential ethical underpinnings of the profession. The call for safety went directly to the central medical professional imperative to "above all, do no harm." The value at issue was nonmalfeasance. As a matter of justice, human rights or the fiduciary obligations intrinsic to the unequal power structure of the provider/patient relationship, the call for systemwide transparency coexisted with fundamental professional standards requiring honesty and disclosure of material facts to the patient.[7-9]

Accountability for Delivering Effective, Safe Care

Early Western medical traditions were organized through guilds that kept the special knowledge and skills involved in medical practices a secret.[10] At a time when many medical methods were of dubious foundation, rarely beneficial and frequently harmful, the challenge of securing the trust of society was significant.[11] The primary method was to root out the charlatans. As modern concepts of negligence developed, emphasizing litigation to deter substandard behavior and individual accountability for procedures and actions causally linked to adverse outcomes became embedded in both medicine and law.

In an important parallel development, as treatments became increasingly effective, the medical field began to establish methods for accountability, and the profession's credibility in society rose. The scientific method was essential in that development, and with good reason, medicine has adhered to it. The three-phase approach to establishing the efficacy and safety of new medical therapies — Phase 1, clinical trials to assess safety; Phase 2, clinical trials to ascertain efficacy; and Phase 3, trials to compare it with another standard intervention — was essential, too. The dependence on the randomized clinical trial as the touchstone of the scientific method was critical to that process. The goal was to be sure that medicine was, and was seen as, a clinical research-driven, reliable practice. The effort was successful; society recognized that medicine merited its standing as a profession with specialized expertise to use powerful methods applied appropriately. Consequently, these scientific and clinical research methods and their associated ways of thinking became well entrenched.

The growth of medical sciences also changed standards in medical education, licensure and peer review. The early apprenticeship model was supplemented by requirements for a phase in which didactically acquired knowledge was transmitted prior to the apprenticeship. As specialties developed, these sought to codify and legitimize their expertise through testing and certification. With the development of safer and more effective surgery, medical care delivery systems began focusing on hospitals; standards for these delivery systems were understood to be necessary. Certification of hospitals and other health care delivery systems followed, often with professional groups, such as the Accreditation Council for Graduate Medical Education (ACGME) and the Joint Commission, serving quasi-government oversight and public protection roles.

The nascent realization that health care, including the clinician and other components, also needed to be accountable for learning from error was harder to grapple with. Faltering moves were made toward tort reform and institutional accountability for safety practices. A model for accountability of clinicians that included accountability for continuous learning set the stage for, but stopped short of, a full rendition of what accountability for understanding and optimally designing safe health care systems required.

Health Care as an Industry

Beginning in the first half of the 20th century, the industrial era phased into the service industry era. Systems thinking was an established part of industrial engineering and applied in production lines and service industries. Yet medicine maintained a separation from these changes. This may have been possible mainly due to medicine's standing as a revered profession with a privileged relationship to society, but in part, it also may have occurred because both providers and patients protected the one-to-one model of the doctor-patient relationship. Thus, the health care paradigm remained focused on the patient-physician relationship and on a therapy's point of application, rather than on the systems of application. The practitioner was trained and certified to apply therapy at the point of the illness-causing disorder. Even in the more expansive bio-psychosocial model, safety-oriented systems thinking was missing, even though the roles of the patient's immediate relationship circle and of the community and society were acknowledged.

Rising and apparently uncontrollable health care costs, coupled with increasing evidence of poor quality, ushered in the managed care era, along with demands from the public for accountability. Additionally, increased media exposure of preventable medical errors raised troubling questions that propelled a search for new solutions. Leape's earlier publication of the theoretical possibility of applying industrial human-factors engineering concepts to health care,[12] and the subsequent demonstration with Bates and colleagues[6] of the utility of systems analysis in understanding medication error later that year, provided that new type of thinking. The first conference on patient safety and systems error at the Annenberg Center for Health Sciences in 1996 was a natural next step toward a new type of thinking.

Rethinking Risk

Thought leaders from medicine and policymakers began to carve a new way of understanding risk, new ways to reaffirm relationships with patients, and a new way of addressing the shocking realities that epidemiologic studies, such

as Leape's 1994 landmark study, *Error in Medicine*, had presented.[12] A decade earlier, anesthesiology had made substantial improvements by applying systems thinking translated from methods used in aviation and mechanical engineering, but the rest of medicine had failed to generalize it. Quality improvement and risk management had both developed as disciplines within health care, with an emphasis on health services delivery research and measurement. These and other developments produced a readiness for looking at what might be learned and adapted from other high-risk industries and complex organizations.

Emphasizing Teamwork as Well as Dyadic Relationships

Early attempts at systems change revealed one Achilles heel of implementation: dysfunctional relationships between clinicians and other workers. Mirroring some of the developments in aviation — in which a focus on teamwork complemented attention to refinement of mechanical systems — health care began to recognize the importance of team functioning, particularly for communicating across authority gradients. Training in teamwork became a foundational building block for the new field of patient safety.

The discipline of patient safety rejected the concept of health care delivery as an exclusive dominion of the medical profession over the patient-physician relationship. The vision was more inclusive and demanding. It included patient-centered care and the biomedical model, and it focused on interdisciplinary teams and families. It also included the technical and administrative aspects of health care delivery in a complex system.

DEFINING PATIENT SAFETY

As the intellectual history of patient safety developed, it became increasingly important to define patient safety. Thought leaders began to examine their different assumptions. Is patient safety a way of doing things — i.e., a philosophy (with its own explanatory framework, ethical principles and methods) and a discipline (with a body of expertise)? Or is it an attribute — i.e., a goal and a condition (being safe), a property that emerges from the system? Existing definitions seemed to vary on the question.

Although the Institute of Medicine (IOM) defined safety as "freedom from accidental injury," patient safety as a discipline or field of inquiry and action has not been fully defined to date in the major consensus statements of the organizations that have propelled its existence. Part of the challenge lies in distinguishing safety from quality, a line that remains important to some, while being dismissed by others as an exercise in semantics. In 1998, the IOM convened the National Roundtable on Health Care Quality, which adopted the following definition of quality that was widely accepted: "Quality of care is the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge."[13]

Health care quality problems were classified into three categories: underuse, overuse and misuse, all of which the evidence shows are common. Misuse was further defined as the preventable complications of treatment. Although the IOM Roundtable was careful to distinguish misuse from error (the latter may or may not cause complications), the misuse category became a common reference point for conceptualizing patient safety as a component of quality.

In 2006, Leape and Berwick observed that, as attention to patient safety has deepened, the lines between the overuse, underuse and misuse categories have blurred. "It seems logical," they wrote, "that patients who fail to receive needed treatments, or who are subjected to the risks of unneeded care, are also placed at risk for injury every bit as objectionable as direct harm from a surgical mishap."[14]

The National Patient Safety Foundation identified the key property of safety as emerging from the proper interaction of components of the health care system, thereby leading the way to a defined focus for patient safety, namely systems.[15] Its goal has been defined as: "[t]he avoidance, prevention and amelioration of adverse outcomes or injuries stemming from the process of care."[16]

Our Definition of Patient Safety

We use the following definition of patient safety:

> Patient safety is a discipline in the health care sector that applies safety science methods toward the goal of achieving a trustworthy system of health care delivery. Patient safety is also an attribute of health care systems; it minimizes the incidence and impact of, and maximizes recovery from adverse events.

This definition acknowledges that patient safety is both a way of doing things and an emergent discipline. It seeks to identify essential features of patient safety.

The Why, What, Where, How and Who of Patient Safety

Going farther with the definition, each of its components

is expanded here to offer a deeper description of patient safety:

Why does the field of patient safety exist? Patient safety as a discipline began in response to evidence that adverse medical events are widespread and preventable, and as noted above, that there is "too much harm." The goal of the field of patient safety is to minimize adverse events and eliminate preventable harm in health care. Depending on one's use of the term "harm," it is possible to aspire to eliminate all harm in health care.

What is the nature of patient safety? Patient safety is a relatively new discipline within the health care professions. Graduate degree programs are currently being introduced in recognition of patient safety as a discipline. It is a subject within heath care quality. However, its methods come largely from disciplines outside medicine, particularly from cognitive psychology, human factors engineering and organizational management science. That, however, is also true of the biomedical sciences that propelled medicine forward to its current extraordinary capacity to cure illnesses. Their methods came from biology, chemistry, physics and mathematics, among others. Applying safety sciences to health care requires inclusion of experts with new source disciplines, such as engineering, but without any divergence from the goals or inherent nature of the medical profession.

Patient safety is a property that emerges from systems design. Patient safety must be an attribute of the health care system. Patient safety seeks high reliability under conditions of risk. Illness presents the first condition of risk in health care. Patient safety applies to the second condition: the therapeutic intervention. Sometimes the therapeutic risk is audacious, such as when a patient's heart is lifted, chilled, cut and sewn during cardiac transplantation surgery. Risk and safety are flip sides of the therapeutic coin.

Patient safety demands design of systems to make risky interventions reliable. Two tenets of complexity theory apply: First, the greater the complexity of the system, the greater is the propensity for chaos. Second, in open, interacting systems, unpredictable events will happen. The better the therapeutic design, the more resilient it is in the face of both predictable and unpredictable possible or impending failures, so they can be prevented or rescue can be achieved.[17] Safety systems include design of materials, procedures, environment, training and the nature of the culture among people operating in the system.

Berwick and others have collaborated with Amalberti to apply Shewhart's notion of statistical quality or error levels to health care.[18] Systems are categorized by their level of adverse events. Barriers to progression from one level to another are identified. Interestingly, leaders of high-reliability organizations in other industries view the level of adverse events in medicine as so high that many of them would consider the health industry as existing in a state of chaos. The patient safety discipline seeks systems that can move health care to higher and higher levels of safe care.

Patient safety is a property that is designed for the nature of illness. High-reliability design is a concept that was not originally developed for health care. However, health care has some essential features in common with how high-reliability design has evolved. While often complex and unpredictable, it can have the ultimate high-stakes outcome: preservation of life.

A unique feature of patient care is its highly personal nature. Provision of care almost always requires health care workers to cross significant personal boundaries, both psychological and physical. To protect patient integrity, the health professions have developed codes of professional ethics that guide how best to provide health care without doing dishonor to the ill person. Patient safety designs must allow for these important restrictions, which include confidentiality, physical privacy and others. At times, these needs conflict directly with the transparency and vigilance needed for optimal patient care, including safety.

Another unique feature is the natural progression of illness. By definition, when illness care begins, something has already gone wrong. Thus, in many medical situations, failure to provide the correct intervention causes harm to the patient. A missed diagnosis of meningococcal meningitis, for example, usually results in patient death. The patient safety discipline acknowledges the need to include harm due to omission of action, as well as the obvious harm due to actions taken.

The vast diversity of possible etiologies and manifestations of illness makes systems design in health care a unique challenge. Nonetheless, the reality is that most conditions are common and of common etiology, which allows for optimal design, if not infallible outcomes. If most patients with a condition such as breast cancer are best treated according to protocol but some require off-protocol, tailored treatment, systems can be designed to meet that need for the majority of protocols with tailoring options.

Patient safety is a property dependent on open learning. Patient safety has another inherent feature that derives directly from its dependence on errors and adverse events as a main source of understanding. It depends on a culture of openness to all relevant perspectives in which those involved in adverse events are treated as partners in learning. In this sense, patient safety espouses continuous cycles of learning, reporting of adverse events or near misses, dissemination of lessons learned and the establishment of cultures that are trusted to not cast unfair blame. The patient safety field marries principles of adult education and effective behavioral learning with the traditional approaches of the medical profession. Known from its early days as the field that seeks to move "beyond blame" to a culture trusted by all to be just patient safety, patient safety pioneers have pushed for a much deeper understanding of the mechanisms of errors that often lie beyond the actions or control of the individual.

Patient safety advocates turn away from the traditions of the guild in which social standing and privileged knowledge shielded practitioners from accountability. They also reject the defensive posture of old risk management approaches in which physicians and leaders of health care organizations were advised to admit no responsibility and to defend all malpractice claims, whether or not they were justified. Patient safety embraces organizational and personal accountability, but it also recognizes the importance of moving beyond blame in both its organizational and its personal dimensions, while maintaining accountability and integrity in interactions with patients and families who have suffered avoidable adverse events.

Trustworthiness is essential to the concept of patient safety. The health care system designed for patient safety is trustworthy. This is not because errors will not be made and adverse events will never happen, but because the health care system holds itself accountable to applying safety sciences optimally. Patient safety (as an attribute) prevents avoidable adverse events by paying attention (as a discipline) to systems and interactions, including human interactions, and allowing learning by all parties from near misses and actual adverse events. Through a concerted, conscientious effort, all those involved act to minimize the extent and impact of unavoidable adverse events by creating well-designed systems and well-motivated, informed, conscientious and vigilant personnel, and by seeking to repair damage honestly and respectfully when it occurs.

Where does patient safety happen? The ultimate locus of patient safety is the microsystem. That is, the immediate environment in which care occurs — the operating room, the emergency department and so on. It is in the microsystem where the "sharp end" resides, where patient-caregiver interactions occur, where failures of safety emerge, and where patients are harmed. Breaches in safety may have occurred in many blunt-end components, and as described above, events constitute properties of interacting components of the overall system. Therefore, patient safety is irreducibly a matter of systems. Nonetheless, as the setting where the patient receives health care, the microsystem is the locus where the successes or failures of all systems to ensure safety converge.

At the same time, patient safety must be concerned with the entire system. Importantly, patient safety recognizes that the microsystem is inherently unpredictable. Although it takes a mechanistic view of causation, patient safety acknowledges that each microsystem is open in that it can be influenced by another microsystem. This may result in something unpredictable. Thus, for instance, the microsystem of concern in surgical safety might be the operating suite, but if a local emergency demands that two members of the surgical team leave the operating room, the microsystem has been unpredictably affected.

How is patient safety achieved? A number of mechanisms are involved in achieving patient safety, including:

High-reliability design. The fundamental mechanism by which patient safety can be achieved is high-reliability design, which includes many components. Thus, the irreducible unit of patient safety delivery is multifaceted; all components of health care delivery must be integrated into a system that is as reliable as possible under complex conditions.

A unique feature of high-reliability design comes from complexity theory, which notes that open, interacting systems will produce some level of chaos or inherently unpredictable events. High-reliability designs are resilient even when unpredictable events occur.

Additional design features that guide health systems engineers include "lean process" and a notion of breaking through reliability boundaries in leaps from one safety level to another. These levels of reliability are often known as sigma levels — through the use of simplified and better processes.

The concept of a multilayered system, in which the failures

within each of the layers must be aligned for an error to occur, is known as the "Swiss cheese" model of accident causation.[19] The components that make up the system include the institution and its organization, the professional team and the individuals it includes and the technology in use.

Error traps (i.e., unpredictable situations in which error is highly likely) are another vivid concept on which safety sciences focus. The notion is that health care delivery is not only complex; it is also an open interacting system, in which illness is also a given, so the opportunities for making errors are many and endemic. Health care workers and health systems designers must therefore take this into account.

Safety systems design in health care is early in its development. Practical approaches to design for safety have been pioneered by the Institute for Healthcare Improvement (IHI), the Agency for Healthcare Research and Quality (AHRQ) and the World Health Organization's (WHO) World Alliance for Patient Safety (see also "Applying the Patient Safety Model," below), among others. For instance, patient safety designs can be thought of as falling into two types: those that are for types of routine care that vary little and can best be managed with protocols allowing for little deviation, and those that are for unique situations where on-the-spot innovation and significant deviation from protocol are required.

Safety sciences. The term "safety science" refers to the methods by which knowledge of safety is acquired and applied to create high-reliability designs. The objective is to design systems that approach "fail-safe" conditions — i.e., those that ensure proper execution. The ideal design is one in which the operator cannot perform the function improperly. Short of that ideal, much of the effort in the past has been directed toward developing defenses, which are barriers that prevent an unsafe act from resulting in harm. Over the years, health care has developed many of these barriers, and usually several must be breached for patient harm to occur.

Acquisition of objective knowledge is a matter of science. Patient safety uses methods that are appropriate to the purpose, and these can be drawn from a range of disciplines. Some, such as understanding human error, come from human physiology and psychology. Some, such as systems analysis and quality improvement, come from engineering and management. Others, such as organizational behavior, come from the social sciences. Still other methods come from health services research. The disciplines that contribute to safety use the methods that are appropriate to each field. These include controlled experiments, repeat tests and other traditional scientific methods. Human factors engineering is built on, as appropriate, randomized controlled trials of human performance, anthropometry, anatomy, physiology, physics and mathematics.

A strong claim can be made that although safety sciences are scientifically grounded, the fundamental drive toward and the cutting edge of inquiry in patient safety uses the narrative; i.e., the stories of adverse events yield insights and drive adjustments. Stories provide pattern recognition for patient safety practitioners. Stories of patient safety, like other stories, are specific and yet have insights that can be applied to other settings. This feature is well suited to the need for dealing with events that might be either familiar or entirely unpredictable.[20]

Importantly, however, one of the founding contributors to the safety sciences had a critical reason and unique standing to claim the term "science" for the safety sciences. Philosopher Karl Popper — famous for his work in defining the scientific method — working with MacIntyre, identified error (and by extension, one can include systems failures more generally) as analogous to data that refute a hypothesis in the scientific method.[21] Sciences, such as chemistry or biology, use as their core method a cycle that comprises observation, hypothesis generation, testing and hypothesis verification or alteration, depending on the results of testing. Deviation from this method causes the knowledge to be unreliable and the deviant methods to be discarded as unsound.

The patient safety discipline uses an analogous cycle — observation, design, testing, then use — as its method, and system adjustment is based on analyzing how adverse events came about. This, in turn, is based on Deming's assertion that making a change is a key source of knowledge for systems.[22] The rather close analogue of method warrants the use of the term "science" in the safety sciences.

To understand how human performance slips up, psychology, physiology or social science must be used. To understand how a machine fails, engineering methods must be used. Each method must be used with its full insistence on rigor so that the new knowledge is as reliable and objective as possible. However, in contrast to the application of the scientific method in the physical sciences, for ethical and practical reasons, in patient care there rarely can be a con-

trol or a repeat of the same event to check for reproducibility, except in a simulated environment. Nonetheless, when the analytic method has yielded to the best of its capacity a new insight, then this — like the new data in the process of science — generates a new cycle of adjusted design, testing and use. In short, the analytic method must be unique to the adverse event, but then the safety sciences use the insight generated to create a new cycle of improved understanding and system design.

In short, patient safety applies many methods and techniques. However, two analytic methods have become widely associated with the field. One is retrospective. The analysis of what went wrong when an adverse event has occurred is known as "root cause analysis" (RCA). Perhaps the close identification (probably excessively so) of patient safety with RCA is a result of heightened attention that occurs after a bad event. RCA is an approach to finding out what underlying features of a situation contributed to an adverse event. Adopting the idea that the immediate cause of an event is almost always the end result of multiple systems failures, RCA seeks, by review of data and interviews, to identify and understand all contributing causes in order to redesign the systems to make them safer in the future.

The other characteristic method of patient safety is prospective. Attempting to anticipate and prevent adverse events through safety design is known as "failure modes and effects analysis" (FMEA). FMEA is an engineering approach, usually taken early in the development of a product, that seeks to imaginatively identify potential failures and their effects. Knowledge from past failures might contribute to a designer's ability to foresee potential failures in their design.

Designs are then adjusted to make failure less likely. FMEA is used in analyzing every aspect of a system's design, including the system's global functioning, its components and their interactions, the functioning of equipment, the programming of equipment and the procedures for activities.

Nevertheless, no one method is enough to produce the range of knowledge and types of understanding required for patient safety. In contrast to the clinical sciences in which the randomized controlled trial is the research method of choice, patient safety eschews the notion that the field can have confidence in a single "gold standard." In patient safety, contributions are sought from engineering, social sciences, psychology, psychometrics, health services research, epidemiology, statistics, philosophy (theories of justice, accountability), ethics, education, computer sciences and more. Each discipline uses its own particular methods; patient safety takes each on its own merits and selects the method most suited to the topic or question at hand.

Measurement remains an important area for development in patient safety. Many needed measures have not yet been developed. The IHI talks of three types of measurement: process, outcome and balance.[23] Process measures may need to be developed and validated for a complete bundle of carefully selected procedures for a given clinical setting. Outcome measures might need to be developed for the particular outcome in question, but they might also need to be used in a fashion that has been developed to allow for balance — i.e., to look at the impact of intervention in one place in the system on other places in the system.

Methods for causing change. With its emphasis on making changes in health care workers' actions, patient safety seeks to engage methods to bring about improvements that go beyond transmission of knowledge and acquisition of skills to the effective implementation of appropriate skills. In this regard, patient safety builds on the insights and techniques of quality improvement. By its nature, separation between acquisition of new knowledge and service delivery is minimal.

Rapid cycles of feedback and response methods for institutional improvement were pioneered in health care by Berwick and others.[24] These processes are derived from continuous quality improvement methods originally designed by Deming[22] and others. The methods focus on the systems of health care delivery more than on the medical issues and the knowledge that the rapid cycles produced are of the specific local system. The methods are designed to improve services in areas where a gap between acknowledged standards and actual practices exists. Usually, a guideline or protocol that has already been endorsed by an expert medical body or bundle of established practices is to be applied. The rapid cycles tend to keep the guideline or protocol or bundle the same, altering its application only to optimize its full use in the local system. Once the implementation is done, quality indicators are monitored to maintain the new standards.

Patient and family voice is important throughout. Adverse events are subjected to analysis, which feeds into redesign or adjusted design of the systems of care. More traditional

health services research and other methods of acquiring understanding are also fed into the recomposition of the systems.

Dissemination of change is not a characteristic of the approach that uses rapid cycles or of quality improvement more generally. This is in great part because the methods are designed to be tailored to the local system; therefore, they do not readily generalize, and measures of success might vary for the same reason. However, approaches that standardize measures and quality improvement methods are being used, which will allow for better dissemination.[25] Alternatively, more traditional campaigns to get individual health care sites to each do their own improvement work can be used, as has been done by the IHI.

Who is a patient safety practitioner? Most health-related disciplines are characterized by specialists who devote themselves to the full-time practice of the discipline. Similarly, patient safety is emerging as a specialty in which education at the masters' level is offered and to which patient safety offices and patient safety officers devote their full-time effort.

However, patient safety requires that all members of the health care service delivery team be "patient-safety minded." It also depends on both hands-on patient safety practices and leadership within every discipline in health care. As a quintessentially collaborative activity, patient safety needs leaders in each area of clinical administration and in each clinical discipline — including doctors, nurses, pharmacists and others — in addition to information management, equipment and plant management and other areas. Patient safety practitioners truly include everyone in health care.

For those who have an advanced degree in patient safety or a role determined by patient safety, it could be a primary professional identity. For most, it will be a personal and professional commitment — a part of their identify, but not their primary identity, which will remain cardiology or plant management, etc. Nonetheless, since all in health care should acquire the characteristics needed for practicing safety, it is important to know what characteristics a patient safety practitioner (whether by primary or secondary identity) should have.

What skills or unique characteristics should a patient safety practitioner possess? A professional who provides direct care needs to have a kind of wariness or patient safety vigilance. This quality is most often informed by a rich knowledge about adverse events and how to help avert them or minimize their damage. This kind of practical wisdom or "safety savvy" grows continuously from experience and an ability to recognize when something is not right. Often an adverse event that is about to unfold can be averted or its impact minimized if it is caught in action.

Patient safety practitioners are well storied. The role of narrative in patient safety has been emphasized, both as a vehicle for acquiring safety-relevant knowledge and as a vehicle for becoming, what Weick has called, mindful or safety wary.[26] They understand that health care systems are full of "error traps," and they are vigilant in foreseeing and preempting, mitigating and rescuing patients from them. Reason envisions a future for patient safety in which its practitioners share many true stories of adverse events in their training and educational venues.[20] He sees this as the normative method for making members of the health care community "safety wise." For example, studies of pediatric cardiac surgeons found that those surgeons — who were inclined to detect their errors and fix them, even at the price of having a longer and less elegant operation — had the best outcomes and reputations.

Patient safety practitioners must also become excellent team members, whether they are natural leaders or better in other roles. They must be able to substitute for one another and appreciate the other's perspective. Importantly, since vigilance is essential for patient safety and is also tiring, working in teams during shift work is essential.[27]

A PATIENT SAFETY MODEL OF HEALTH CARE

With the above aspects of patient safety lined up, it is possible to see a simple model of patient safety. While good models of patient safety have been constructed, we seek an overarching model that is simple, fully authentic to the subject matter, and compatible with the good existing models. At the same time, it should be simple enough that it can be seen in a readily sketched diagram and stated in a simple, short sentence that can be easily recalled. Only such a simple model can ubiquitously permeate the interstices of daily thought among all the necessary people throughout health care.

We offer the following simple model with which to view patient safety. It divides health care systems into four main domains:

- Those who work in health care.

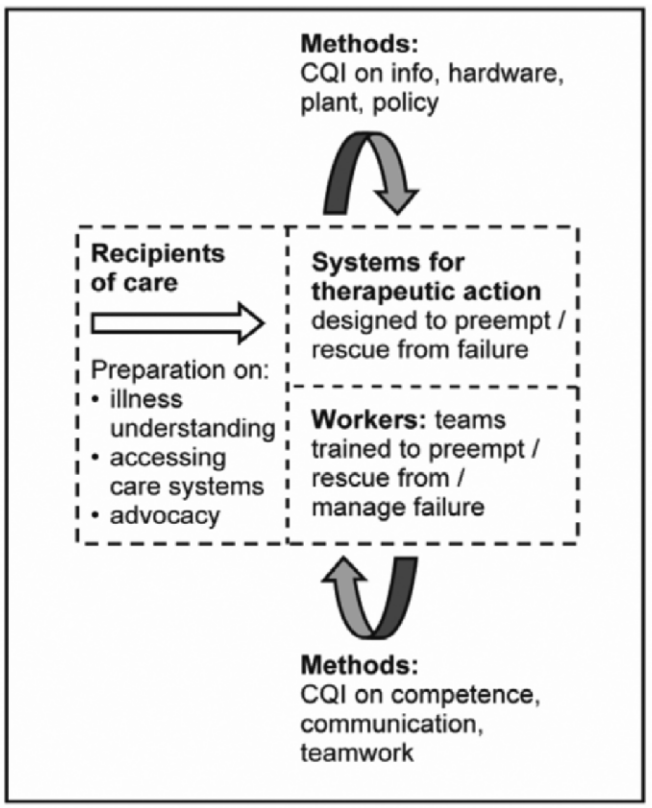
- Those who receive health care or have a stake in its availability.
- The infrastructure of systems for therapeutic interventions (health care delivery processes).
- The methods for feedback and continuous improvement.

These four domains are represented graphically in Figure 1. Each domain interacts with the other domains and with the environment, as depicted by the semipermeable divisions (dotted lines) between them and at their outer edges. The result is a core, overarching model for patient safety.

The model is consistent with the descriptors of patient safety stated above: *What*…? and *Where*…? correspond to the third domain, i.e., "Systems for therapeutic action." *How*…? corresponds to the fourth, "the Methods"; *Who*…? corresponds to the first and second, i.e., "people who work in health care" and "people who receive it or have a stake in its availability."

The model is also consistent with existing frameworks of thinking that underpin patient safety. Each framework defines categories or elements that fall coherently within one or more of the four domains, as displayed in Table 1.

Figure 1. A patient safety model of health care.



Deming's[22] notion of "deep knowledge" of quality design required an understanding of (1) the system; (2) variation in its performance; (3) how to use change as a source of knowledge; and (4) the psychology of people in the organization. All of these elements drive quality improvement, and they belong within the domain of "methods."

Donabedian divided health care into structure, process and outcomes for the purpose of measurement.[28] It is also a helpful way of categorizing the health system for the purposes of understanding how elements of the system interact. For this reason, the categories can be thought of as cutting across all four domains in the patient safety model.

Vincent[16] identified seven elements that influence safety:

1. Organization and management factors.
2. Work environment factors.
3. Team factors.
4. Task factors.
5. Individual factors.
6. Patient characteristics.
7. External environment factors.

These factors distribute among the three domains: systems for therapeutic action, the people who work in health care, and the people who receive it or have a stake in its availability.

Carayon and colleagues proposed a Systems Engineering Initiative for Patient Safety (SEIPS) model for design in health care.[29] In the SEIPS model, elements are helpfully depicted with intersecting arrows that illustrate how the elements can interact with one another, so indicating the notion of emergent properties.

The above elements do not represent an exhaustive list. In addition, elements can be subdivided into their content areas, which is not attempted here. For instance, external environment has been divided into physical, social and biologic areas.[30] The elements can also be categorized in different ways. For example, team factors could be included within work environment. The purpose of this simple, broad model of domains is to capture the largest category of essential components in patient safety and their interaction with one another.

The fashion in which this or any patient safety model applies must vary by setting as dramatically as the settings vary. The nature of the illnesses and social setting, the nature of the therapies, the nature of the human resources

Table 1. How domains and elements relate in the patient safety model.

Domain	Systems for therapeutic action	People who work in the health care system	People who receive health care or have a stake in its availability	Methods
Content areas	• Structure • Process • Outcome			
	• Organization & management • Work environment • Task factors • External environment	• Team factors • Individual factors	• Patient characteristics	• System knowledge • Understanding of variation • Understanding of how change yields knowledge • Psychology

and the nature of the physical infrastructure all will contribute to defining the very different systems. These systems must be analyzed and options identified for improvement. However, the fundamental concepts in any good patient safety model are applicable to most settings.

What is the utility of this model and of the other models with which ours is built to be compatible? Our model and other models provide a way of seeing the component elements involved in patient safety and how they interact. So, when designing a system, improving a system, analyzing an adverse event, researching an issue or measuring a new intervention, such models provide a ready map of matters that should be considered. Given the human tendency to limit the scope of focus, models provide a countervailing stimulus to include the whole universe of domains and their elements that could be involved in the patient safety issue at hand.

CONCLUSION

The field of patient safety has emerged in response to a high prevalence of avoidable adverse events. However, many do not use a clear definition or have a clear model of understanding of the field. We call on organizations to adopt a definition and model for patient safety. To assist the process, we provide a definition and describe the nature of the field by going through each component in the definition. We identify its primary focus of action as the microsystem and its essential mechanisms as high-reliability design and the use of safety sciences and other methods for causing improvement, including cultural change. We describe key attributes of those who practice safety, and we identify its practitioners as all involved in health care. To provide an easy-to-recall, overarching model of patient safety, we offer one that identifies four main domains of patient safety (1) people who receive health care, (2) people who provide it, (3) systems of therapeutic action and (4) methods and elements within each domain. We hope that this description, definition and model will assist the integration of patient safety practices throughout health care.

ACKNOWLEDGMENTS

We appreciate the helpful comments of Ben-Tzion Karsh and the invaluable assistance of Maia Feigon, Andrew Harris and Jonathan Masia-Peters.

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Reprinted from *Advances in Patient Safety: New Directions and Alternative Approaches*. 2008;1.

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PROMOTING BEST PRACTICE AND SAFETY THROUGH PREPRINTED PHYSICIAN ORDERS

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ABSTRACT

Defining how preprinted physician orders are developed within a hospital has the potential to positively affect care, services, reimbursement, safety and patient outcome. When they are well designed, preprinted physician orders have the potential to improve interdisciplinary integration in care, promote accurate communication and reduce variation by combining pertinent reminders, safety alerts and "best practice" into a just-in-time process. Whether in electronic or paper format, preprinted physician orders can transform evidence-based knowledge into practice.

INTRODUCTION

Because physicians' orders for hospitalized patients have the unique characteristic of affecting and bringing together multiple diverse disciplines and processes, designing orders is both an art and a science from which all medical disciplines and patients can benefit. Although physicians may rightfully feel they are responsible for the content of orders, clear, accurate and concise communication requires a coordinated, team approach. Through multidisciplinary involvement, preprinted physician orders (both paper and electronic) provide an opportunity to involve a broad range of perspectives in decisions about the care of a single patient.

In addition to being available for immediate use for commonly performed interventions, other advantages of well designed, preprinted orders include:

- Continued, coordinated and integrated care by communicating "best practice" through multiple disciplines, levels of care and services.
- Modified practice through educated staff and physicians regarding evidence-based care.
- Reduced variation and unintentional oversight through standardized formatting and consistent style in a legible and clear presentation.
- Enhanced time-saving work flow with pertinent instructions that are easily understood, intuitively organized and suitable for direct application to current information-management systems.
- Reduced potential for medication errors through integrated safety alerts and reminders.
- Increased utilization of continued outpatient services post-discharge via appropriate reminders.
- Convenient access to relevant references and other information.
- Simplified data abstraction via indicators for Joint Commission Core Measures and National Patient Safety Goals.[1]
- Improved documentation for utilization and reimbursement purposes.
- Comprehensive orders that clearly communicate directions and reduce unnecessary calls to physicians for clarifications and questions.

Whether they are printed on paper or available for electronic access, development and implementation of well designed, preprinted physician orders requires engineering, education and enforcement. Because physician orders exist at the intersection where multiple disciplines and services (e.g., case and risk management) converge, they are the ideal medium by which to address concerns pertaining to reimbursement, utilization, patient safety and quality measures. Orders are the initial means that enable physicians to communicate with a variety of interdisciplinary hospital caregivers, and they represent the starting point for action and care. In the health care environment, nothing goes forward without calling on the assistance of and providing direction through physician orders.

Although research supports the effects of electronic reminders and computerized physician (or provider) order entry

(CPOE) on patient care,[2] the present article describes our efforts (some of them through trial and error, some supported by research) to define and refine preprinted physician orders (including paper-based models) that improve interdisciplinary integration and accurate communication, while reducing unnecessary variation. We offer ideas about applying elements and concepts of computerized clinical decision-support systems to paper-based models and considering application of paper-based order structures and criteria to the electronic physician order format.

Advances in technology allow preprinted physician orders to have flexibility and the ability to rapidly adjust and adapt to changes in individual hospital processes, patients and available services. Preprinted orders offer a low cost and simple-to-implement opportunity to affect the functional organization of the health care process, quality of care and, ultimately, patient outcome.

THE ESSENCE OF PREPRINTED PHYSICIAN ORDERS

Creating any well-designed physician order requires considerations that can be broadly broken down into the headings of engineering, education and enforcement.

Engineering

Engineering refers to the most mechanical aspects of developing orders, including items such as content, format and medication safety:

- **Content** ensures that orders are comprehensive, correct and coordinated. Content may include information beyond what the physician might initially consider, such as venous thromboembolism prophylaxis and influenza vaccination screening.
- **Format** defines type and layout considerations that can make orders easier to read and comprehend. Elements of format include font, point size, white space, use of symbols, capitalization and adequate space for handwritten entries. Format consistency is improved through attention to standardizing usage, punctuation, arrangement, design and other factors.
- **Medication safety recommendations** call for presenting medication information or instructions in a clear and consistent manner, which is very important for all aspects of physician orders. Advice from the Institute for Safe Medication Practices, the United States Food and Drug Administration and others as it pertains to writing medication orders is presented later in this paper.

Education

Preprinted physician orders offer an excellent opportunity to provide and implement timely instructions to physicians, staff and patients regarding "best practice" and general patient safety. This information might involve attaching pertinent printed patient education material to the orders for easy and timely distribution by the nurse to the patient. It might also involve printing appropriate reference information on the reverse side of paper orders (or offering an appropriate Internet link to this information in CPOE). This information might include a listing of applicable formulary medications and dosages, indications of appropriate antibiotic use, evidence-based algorithms to guide care and decisionmaking and a list of reportable core measures for a particular diagnosis. Education regarding safety, "best practice," infection control and outpatient referrals might also be performed through well placed reminders and alerts within the orders.

Enforcement

Managing changes in orders, keeping them current to reflect "best practice," and ensuring that only the most current versions are available and in use offer a different, but related, set of challenges. Without some control of the mechanics of and access to order changing, the potential increases for miscommunication, unacceptable variations and error. Methods for guiding process standardization are discussed later in this paper.

ENGINEERING: CONTENT

Generally, orders begin with content. In other words, the physician writes or creates orders for a specific procedure, diagnosis, care or admission. Examples of content criteria are shown in Table 1.

ENGINEERING: FORMAT

As the population of health care providers ages, it becomes ever more important to make the printed words they rely on to care for their patients as easy to read as possible. Table 2 summarizes several ways to accomplish this.

Further consideration should be given to the way orders look and feel. This involves standardizing the sequence in which information is presented on the order sheet or screen. This method can also be utilized on paper orders to help prepare staff for the transition to an upcoming CPOE implementation. For example, orders may be consistently grouped under headers, as appropriate, in the order shown in Table 3.

Formatting also involves consistency in expressing weights

Table 1. Examples of content criteria.

Criteria	Examples or clarification
1. Do the orders reflect current "best practice"?	Is there evidence to support the orders? Such evidence may come from recently published literature, research, association guidelines, or recommended practices.
2. Are orders comprehensive and do they consider other disciplines?	Do orders include all likely needs, e.g., other services, other disciplines, and discharge planning as appropriate? For example, some physicians might not consider the following when admitting a patient for a diagnosis of dehydration: ☑ Screen patient for smoking history. RT to provide smoking cessation counseling if patient has smoked within 12 months. *(Performance measure)*
	Sometimes it may be necessary to obtain the patient's weight before the pharmacy can determine proper drug dosing. If hospital process requires scanning paper orders to the pharmacy, it would be helpful to including the following information (for the nurse to complete) within the paper/scanned order. An order might read as follows: ☑ Obtain patient weight. Patient weight: _____ ☐ pounds ☐ KILOgrams ☐ actual ☐ estimated
3. Are automatic orders prechecked to reduce the possibility of their being overlooked?	Do orders include the following statement? "Strike through entire line to cancel a prechecked order."
4. Are performance measures indicated, e.g., Joint Commission Core and National Hospital Quality measures?[1]	☑ Screen patient for pneumococcal vaccination history and candidacy. Administer Pneumovax® 0.5 mL IM into deltoid as appropriate prior to discharge. (Performance measure).
5. Is the inclusion of National Patient Safety Goals (NPSG) considered?[3]	☑ Verify (through read back) critical lab values and notify physician immediately. *(Safety measure)* Provide vital sign parameters re: when to notify the physician and when to initiate a rapid-response team call for immediate patient assessment. *(Safety measure)*
6. Is consideration given to infection control measures?	☑ Prep and clip hair of right groin area. *Do not shave.* ☑ Start IV antibiotic of cefazolin (Ancef®) 1 g no more than 60 min prior to incision time. *(Performance measure)* ☑ Cefazolin (Ancef®) 1 g IV q8h for up to 24 h after surgery end time. Start upon arrival at PACU. **Surgery end time** _____ (required for pharmacy to schedule doses). *(Performance measure)*
7. Are listed medications and equipment available at your facility?	Check medications against the formulary. Make sure materials management or bioengineering is able to support equipment items.
8. Are considerations given to coding and reimbursement documentation requirements?	Clearly indicating *inpatient*, *outpatient*, or *observation* status can affect reimbursement. When feasible, include orders such as: • Admit as inpatient to _____ floor. • In some cases. it maybe preferable to provide a forced option for the physician to complete, such as: • Patient status: ☐ Inpatient ☐ Outpatient ☐ Observation status. • Likewise, the following statement may be very helpful in ED orders: "May use nursing documentation for coding."

Table 2. Improving legibility of printed documents.

Criteria	Examples or clarification
1. Is the print simple to read?	A nonserif font (e.g., Arial 12-point) is recommended, especially for paper orders that may be faxed. Errors are more likely to occur when faxed copies are not as clean or legible as they could be.[4]
2. Are instructions complete, unambiguous, and clear?	☑ Nothing by mouth after midnight. …*But no diet was ordered before midnight.* ☑ Elevate head of bed as appropriate. *No indication why, when, or how high.* ☑ Advance diet as tolerated. *Inadequate guidance for the nurse to determine the proper action.* Likewise, write out "Left" and "Right." *The letters L and R may be interpreted as "Lower" or "Liter" and "Raise," respectively.*
3. Is the use of symbols kept to a minimum? Be wary of letters and numbers that may be easily confused or misinterpreted.	• Do not use the symbols "<" and ">". Instead, write out "less than" and "more than." • Slashes (/) can be easily misread as the number one. If a slash must be used, provide a space before and after the slash; e.g., "20 mg / 500 mL"; or write "per" in place of the slash, e.g., 20 mg per 500 mL. • The letter "O" can be misread as the number zero. Writing out "one" and "zero" can sometimes reduce confusion. • Lower case L (l) can be misread as the number one or the capital letter I; e.g., Iodine (iodine) can easily be confused with lodine, or Lodine® (etodolac). • To reduce confusion between certain look-alike letters, consideration may be given to using lower case "i" and upper case "L". This may create issues with "tall-man lettering"; e.g., "miLLiLiTERS" and certain drug names in all capital letters: "iNSULiN".
4. Are attempts made to remove or reduce look-alike or sound-alike items?	For example, "BNP" vs. "BMP". Instead, write out "*brain natriuretic peptide" (or "BN peptide")* and "*basic metabolic panel*".
5. Is "tall-man lettering" used for all look-alike names and words?	"Tall-man lettering" can also apply to words like "eAr" and "eYe".[5]
6. Do the orders include a space for physician ID# next to the signature line?	Including an identification number on the signature line helps identify the physician: _____ _____ _____ Physician signature ID# Date Time
7. Are upper case letters used appropriately?	When lower case letters are used, "PRN" can be easily misread as "pm". The best option is to write out "as needed" or place "PRN" in all capital letters. Likewise, while not entirely chemically proper, "KCL" has been read as "KCI" when all caps are not used, as is technically correct. "STAT" may be placed in all capital letters for emphasis.
8. Are paper orders written on one side of the sheet only?	Orders written on the reverse side of sheets are often overlooked. The reverse sides of orders are best used only for references, additional information, etc.

and measures. When abbreviations are used, they should follow the U.S. Pharmacopeia (USP) standard abbreviations for dosage units. The most common abbreviations are shown in Table 4.[6] In addition, formatting should consider wording to assist unit secretaries in putting orders into hospital-specific information systems. For example, an order to request smoking cessation education for a patient might read as follows:

☑ RT for smoke cessation if patient has smoked within the past 12 months. *(Performance measure)*.

All preprinted orders should use the same template, which includes specified areas for:

- Date
- Orders

Table 3. Optimal presentation of orders.

Order group	Examples
Admission status	*Inpatient, outpatient, observation status.* (These options may be adjusted, depending upon the type of order.) Other aspects of admission status include *full code, no code, comfort care, isolation status, diagnosis, and the procedure to be performed.*
Nursing orders	Wound care, Foley catheter, activity orders, vital signs.
Dietary	Diet orders, tube feedings, nothing by mouth.
IV fluid	Type, rate, amount.
Medications	By mouth, IV, IM, topical, scheduled, PRN, etc. Medication options, when listed on the orders, are generally listed, first by the most commonly used drug and dose, and then by dose size (smallest to largest) and dosing frequency (lowest to highest).
Cardiopulmonary	Echocardiograms, respiratory treatment.
Laboratory	Blood work orders.
Radiology / Imaging	CT, MRI, chest x-ray, and a prompt to include the reason for each test.
Therapy	Physical therapy, speech therapy, social worker.
Consults	Other physicians, case management, wound care nurse, nutritional evaluation, chaplain, et al.
Patient education	Stroke or CHF education booklets, diet education, diabetes care, ostomy training.
Venous thromboembolism prophylaxis	Sequential compression devices for bilateral lower extremities; anticoagulation therapy.
Vaccination status	Screening and orders to vaccinate as appropriate.

- Name of orders
- Date of latest review
- Facility name
- Allergies or adverse reactions
- Pharmacy code (if used)
- Patient identification information
- Page number (e.g., page 1 of 3)
- Appropriate barcode if applicable

Depending on the information system used within a hospital, the pharmacy may be able to code orders for quick and accurate entry into their system. Placing this code under the name of the orders (e.g., "POLUM" printed under the name of post-op lumbar surgery orders 0707) saves order entry time in the pharmacy. Additionally, to avoid potential inconsistencies, if patient allergies or adverse reactions are handwritten entries on paper order tools, they would be listed only on page 1 of multipage paper orders. Ample space should be provided to describe these reactions.

ENGINEERING: MEDICATION SAFETY

Perhaps nowhere is safety more important than in orders pertaining to medications. Table 5 lists some common concerns regarding safety and medication orders. Medication safety also includes alerts and reminders as appropriate to the patient's condition or to the medications or treatments being ordered. Studies have concluded that electronic alerts favorably influence physician practice and patient outcomes.[13-17] Reminder systems can easily apply to paper orders and may involve separate checked (☑) or unchecked (☐) orders; or they may be part of an

Table 4. USP standard abbreviations for dosing units.

m	Meters
kg	KILOgram
g	Gram
mg	MILLIgram
mcg	MICROgram
L	Liter
mL	milliLITER (do not use cc)
mEq	Milliequivalent
mmol	MilliMOLE

Table 5. Common concerns regarding safety and medication orders.

Criteria	Examples or clarification
1. Do the orders limit abbreviations to a minimum and never use unapproved abbreviations (e.g., QD or U)?	• Abbreviations are time-saving measures when handwriting orders. But, since preprinted orders can be readily reproduced by electronic or printed means, abbreviations are no longer a shortcut. They should be used rarely. Abbreviated medication names should be avoided.[7] • The risk of dosing errors can also be reduced by avoiding the use of leading zeros before a decimal point and the use of trailing zeros after a decimal point.[8]
2. Are medication orders numbered?	This is not a recommended practice because the order number may be confused with the medication dose.
3. Are all medications listed together under the title, "Medications"?	• This makes it easier to take these orders off and lessens the possibility of overlooking a medication order. • It also helps the pharmacy in completing the medication administration record. (Remember to include "Saline flush every 8 hours and as needed to maintain patency" under "Medications" when a nursing order calls for a saline lock.)
4. Are blanket or multiple-range orders used? (e.g., 1-2 tablets every 3-4 hours)	Blanket orders can be confusing or imprecise and are not permitted, for example: • "Continue previous medications" is never allowed. • A multiple-range order should read "☐ morphine 1-2 mg IV every 3-4 hours as needed for moderate pain.
5. Do orders always list indications for PRN medications?	Listing the indication helps verify that the medication and dosing are correct.[6]
6. Is "tall-man lettering" used for look-alike medication names?	• A listing of look-alike medication names can be found at: www.fda.gov/cder/drug/MedErrors/nameDiff.htm.[6,9,10] • "Tall-man lettering" can also be useful when spelling out worlds like "TEAspoon" and "KILOgram."
7. If salts are used as part of medication names, do they follow the drug name?	• Write "warfarin Na," NOT "Na warfarin," which may be read as "No warfarin." • Better yet, do not use the salt as part of the medication name unless necessary; or spell out the name of the salt, e.g., "warfarin sodium."[6]
8. Do orders use the word "thousand" and "million" for large doses?	Write "1 million units" or "150 thousand units" rather than 1,000,000 or 150,000 units.
9. Do orders use commas for dosage numbers expressed in thousands?	Write "5,000," NOT "5000".[6]
10. Is there a space between the name of the medication and the dosage or unit of measure?	Write "propranolol 20 mg," NOT "propranolol20mg," which may be misread as 120 mg.[6]
11. Do orders contain a total dose warning for appropriate medications?	For example, many medications contain acetaminophen. The warning, "Maximum total dose of acetaminophen not to exceed 4,000 mg per 24 hours" (for adults)" should be included in all orders with any medication(s) containing acetaminophen.
12. Do paper orders contain a medication warning above the physician signature line as appropriate? e.g., "**Adverse Reaction / Allergy Alert!** These orders contain [aspirin, NSAIDS, antibiotic, narcotic, sulfonamides or MAO] medications?"	This warning serves as a reminder for physicians to check adverse reactions or allergies prior to signing preprinted orders.

Table 5. Common concerns regarding safety and medication orders. (continued)

Criteria	Examples or clarification
13. Do medication orders include drug name, strength, dose, route, and frequency?	☑ Furosemide (Lasix®) 40 mg. Take one tablet by mouth one time daily.[11]
14. Are generic and trade names, if applicable, used?	• Just as patients are identified in two ways, so should medications. List the generic name first followed by trade name in parentheses; e.g., bumetanide (Bumex®). • Some literature recommends placing the trade name in ALL CAPS. • Consider including the drug's purpose for high-risk, easily confused, or problematic drugs.[6]
15. Do medication orders contain criteria for determining the route of administration to be used, if multiple routes are possible?	Give IV until patient is able to tolerate liquids by mouth.
16. Are medication doses written in MILLIgram (mg) when possible and not just in tablets or milliLITER (mL) doses?	☑ Acetaminophen (Tylenol) 500 mg. Take one tablet by mouth every 6 hours as needed for mild pain.
17. Is a timeframe included for IV bolus and IV push medications?	☑ Diazepam (Valium) 5 mg / mL. Give 5 mg IV push, over at least 1 minute, every 4 hours, as needed for muscle spasm.
18. Do the orders refer to all medications (from different specialists, OTC, etc.) as appropriate?	☑ Refer to Medication Reconciliation Sheet for further medication orders. *(Safety measure)* • As appropriate, reconciliation of medications is a National Patient Safety Goal.
19. Do the scheduled times for medication administration promote patient safety?	• The schedule (and stacking) of medications can contribute to falls in the elderly. • Something as simple as changing scheduled medication times for every-12-hour diuretic medications from 9 am and 9 pm to 9 am and 5 pm can decrease nighttime falls in patients trying to get to the restroom.
20. Do orders consider potential errors within the local cultural setting?	• Consider look-alike and sound-alike words within your cultural population. • Perhaps most prevalent in the outpatient setting, a patient received a massive medication overdose when a Spanish-speaking caregiver interpreted "once a day" as "eleven a day." (The Spanish translation of "eleven" is "once.")[12]

order. Examples include the following:

☑ Hold HEPARIN and enoxaparin (Lovenox®) while the epidural catheter is in place.

☑ Do not give narcotics by mouth, IV, IM or by transdermal patch until epidural is discontinued.

☐ Enoxaparin (Lovenox®) 1 mg/kg subcutaneously every 12 hours x _____ doses. (Pharmacy to monitor and adjust dose if patient weight is equal to or greater than 180 kg and/or creatinine clearance less than 30 mL/minute. Hold if patient is going to surgery within 24 hours.)

☐ Clopidogrel (Plavix®)_____mg by mouth x 1 dose. (Hold if going to Cath Lab or CABG within 5 days)."

- Do NOT mix glargine (Lantus®) with other INSULINs.
- Administer pneumococcal and influenza vaccines in separate arms.
- Inform surgeon if the patient has taken warfarin (Coumadin), clopidogrel (Plavix®) or over-the-counter supplements of feverfew, garlic, ginger, ginkgo, vitamin E, kava kava, St. John's wort or valerian within the past five days. (Pre-op testing order.)

Two particularly high-risk, commonly used drugs deserve special attention. There have been several publicized errors involving the accidental switching of HEPARIN and INSULIN.[18] As a result of this risk (and also because these two medications have no secondary names) and to

bring more attention to the names, it is recommended that ALL CAPS be used when writing out these medications.

EDUCATION

All physician orders provide an excellent opportunity to educate others regarding "best practice" and safety through alerts, reminders, references, attached information and indicators. Examples to consider as appropriate include the following:

Patient Safety

Integrating reminders into the process increases effectiveness;[15,17,19] for example:

- This drug may increase risk of falls.
- Do not use a zero AFTER a decimal; always use a zero BEFORE a decimal.
- Do not use the following abbreviations: U; OD; QN; SS; ug; QD; QOD; MS; MS04; MGS04. Instead, write out the intended meaning.
- Provide an indication for each PRN order. (*Place this at the top of each order sheet or screen for quick reference.*)

☐ Ketorolac (Toradol®) 30 mg IV every six hours. (If patient is 65 years or older, reduce dose to 15 mg IV every 6 hours.) Notify physician if creatinine is greater than 1.8 mg/dL before giving this drug.

☐ Telephone Order Read-Back. *(Safety measure) Place this under the nursing signature line.*

"Best Practice"

Indicators are used to provide notice and awareness of *core measures and "best practice"*. For example: Either an ACEI or ARB is prescribed at discharge unless there is a contraindication or reason for not prescribing EACH. (*Performance measure*)

<u>If vancomycin is ordered, please indicate reason:</u>
☐ Beta-lactam allergy
☐ Known colonization with MRSA
☐ Nursing home-stay within past year
☐ Chronic wound care or dialysis
☐ Other _____ *(Performance measure)*
☑ Give the patient/family *Living with Heart Failure* education booklet; instruct on diet, activity, medications, weight monitoring, followup, signs and symptoms (and what to do if they return), smoking cessation/avoidance and hand washing. *(Performance measure)*
☑ Beta-blocker for left ventricular systolic dysfunction

_____ <u>*Contraindications*</u>:
☐ Allergic
☐ Bradycardia (less than 60 bpm)
☐ 2nd or 3rd degree heart block
☐ Systolic blood pressure less than 90 mm Hg
☐ Other _____ *(Performance measure)*

Referrals to Outpatient Services

Preprinted orders also provide the opportunity to educate and remind health care providers of the continuation of optional services provided outside of the hospital. For example:

☐ Outpatient diabetes education postdischarge. Unless the patient has another preference, fax this order sheet to Memorial System Diabetes Center at 555-1234 today for followup.
☐ Cardiac wellness/rehab postdischarge. Unless the patient has another preference, fax this order sheet to Memorial System Cardiac Wellness Center at 555-4321 today for followup.

Infection Control

Health care providers should be aware that determining if infections are present on admission (as opposed to whether they were hospital-acquired) is becoming increasingly important for reimbursement and infection surveillance. For example, consider ruling out a urinary tract infection when a Foley catheter is first inserted, as follows:

☐ Insert Foley catheter. Collect and submit specimen for urinalysis with culture and sensitivity, if indicated.

Reference Information

References can be placed on the reverse side of paper orders, or a link to pertinent information may be inserted into electronic orders. Examples of reference information include:

- A list of formulary medications: e.g., ACEI, ARB, beta-blockers. (CHF and AMI orders)
- A list of pertinent core measures and "best practice."
- Antibiotic usage recommendations for pneumonia, orthopedic surgery patients, et al.
- Recommended treatment algorithms for sepsis, stroke, chest pain, et al.

Attachments to Orders

Attachments provide additional printed information or forms that are specific to the orders. In the electronic envi-

ronment, there may be a link to educational materials and information within the information system.[20] Examples of attachments include specific consent forms and patient education sheets for the nurse to provide to the patient. Attaching these types of documents to orders helps save storage space on the nursing units, and the information may be updated in tandem with the orders.

Other Tools

In an electronic environment, physician orders can offer automated support through links to research, literature, regulatory standards and treatment algorithms. Advances in information systems can also compare orders against dosing standards, check for allergies or adverse drug reactions, perform drug-laboratory value and drug-drug interaction checks and warn about potential errors of omission (e.g., failure to request a partial thromboplastin time [PTT] after ordering HEPARIN) in real time.

"Alert Fatigue"

Alerts, reminders, references and attachments are helpful and timely job tools that assist with proper care, but they should not become intrusive or hamper the work process. Although they can be quite beneficial, care must be taken to ensure that reminders and alerts are not overused. "Alert fatigue" can occur in both the paper and computer environments, when caregivers start ignoring bothersome and inappropriate aids.[21]

ENFORCEMENT

Gaining control over preprinted paper orders within a hospital setting can be a challenge. Quite often, physicians create paper orders on their home computers. Frequently, old orders are hoarded, copied and distributed from nursing units. These unreviewed orders show up suddenly on patient charts with confusing directions, outdated medications, unapproved abbreviations, conflicting instructions, poor legibility and even letterhead paper from other hospitals. CPOE eliminates many of these issues.

Managing preprinted physician orders on paper includes limiting the number of copies that can be requested from the print shop at any one time (e.g., 25 copies or a two-week supply). This helps to ensure that old orders are not still in use for months after changes have been made (e.g., waiting until current floor stock of previous form is depleted). Placing blank physician orders on copying machines should be prohibited. (Copying machines are unable to adequately copy barcodes, which disrupts scanning into an electronic record.) Nursing departments can print copies directly from the print shop intranet site until requested print shop copies are delivered.

Our clinical "best practice" (CBP) committee meets for one hour monthly to determine and develop order criteria and review existing and new physician orders. The ability and authority to modify orders has been limited to this committee. The CBP committee also reviews current literature and research as it pertains to, and can be integrated into, physician orders. Depending on the orders being reviewed, input at these meetings may be requested by any clinical area of the hospital—e.g., pharmacy, case management, various physicians, emergency medicine, Joint Commission coordinator, patient safety officer, nursing, dietary, admissions, birth care, unit secretary, radiology, laboratory, stroke coordinator, rehabilitation. Each reviewed order (along with CBP recommendations for changes) is forwarded to the authoring physician for final approval. A brief list of the order criteria created by CBP is also provided to the physician for reference (see Table 6). Final approval by the physician is required before any modified order can be implemented.

The CBP committee names or titles each order in a standardized manner to simplify locating specific orders from the files or print shop. For example, an order from a particular physician might be named: "Dr. Black Post-op Pacemaker Orders 0907." This title indicates the name of the physician; the type of order (e.g., pre-op, post-op, admission, discharge); the procedure or diagnosis; and the date last approved. Orders used by a specific group of physicians may be named with the group name first (e.g., "Riverside Vascular Post-op AAA Surgery Orders 0807"). Orders used by a diverse group of practitioners may be named, "Pneumonia ICU Admission Orders 0807." The CBP also reviews orders (and any associated references, information, alerts or attachments) on a routine basis to ensure that they reflect current "best practice" and process.

CONCLUSION

Whether in paper or electronic format, well developed physician orders have the ability to affect and help with a multitude of concerns within health care today. Furthermore, preprinted physician orders have the potential to benefit all patients and disciplines. These orders do not require new technology (although they might use it), and once defined, they are low in cost and simple to use. However, maintaining orders in accordance with "best practice" does require a fair amount of vigilance and routine reviews. Perhaps the best advantages of preprinted physician orders lie in their ability to modify physician practice, guide care decisions, provide a

Table 6. Creating preprinted physician orders for clinical "best practice" review.

Criteria for consideration when creating or revising preprinted physician orders	
Content and format	**Yes**
1. Orders reflect current "best practice"	
2 . Orders are created in Arial 10- or 12-point font	
3. Orders do not contain unapproved abbreviations	
4. Orders do not contain confusing symbols (e.g., < and >)	
5. Blanket orders are not used. (i.e., Resume home meds).	
6. Order contains space for physician signature, physician ID #, and date	
7. Admission orders include "Admit as inpatient," "Outpatient," or "Observation Status," as appropriate	
8. Orders are single-sided (Reverse side of sheet should contain additional information or references only)	
Medication safety	**Yes**
9. Abbreviations, when used, are kept to a minimum	
10. Medication orders are not numbered	
11. Medication orders contain drug name, dose, route, and frequency	
12. If multiple routes are listed, order contains criteria to determine which route to use	
13. When possible, order contains dose written as **mg**, and not as **tablets** or **mL**	
14. Order does not contain multiple ranges	
15. Order contains indication for PRN medications	
16. Time frame is written for IV bolus / IV push orders	
17. Generic and trade names (if applicable) of medication are used	
Actions by the clinical "best practice" committee (CBP) may include:	
Arranging presentation of orders according to standardized format Adding indications of regulatory / Performance measures, etc. Adding DVT prophylaxis, vaccination status, smoking counseling, patient education, etc Adding safety alerts and reminders as appropriate Adding maximum daily dosage alerts on medications, as appropriate Including computer software-specific language for order entry Naming the orders according to standardized process to simplify order search / identification Review of orders for clarity of intent	

CBP may contact the physician before modifying an order and will request final approval by the authoring physician before implementing or distributing orders.

comprehensive perspective and readily adjust to changes.

CPOE may decrease errors and improve quality, but concerns regarding their high implementation cost, operational disruption and return on investment have proven a major barrier to immediate and widespread adoption throughout the health care industry.[22,23] Fortunately, during this transitional phase of information management, we have an opportunity to share many of the beneficial aspects of paper and electronic formats of physician orders.

Writing good preprinted physician orders is both an art and a science that requires a team approach. When well designed, these orders integrate pertinent reminders, safety measures and "best practice" into a just-in-time process. Whether in an electronic or paper format, preprinted physician orders can transform evidence-based knowledge into practice. As such, they have the potential to influence good practice and promote patient safety through clearly written communications.

ACKNOWLEDGMENTS

We extend special thanks and our appreciation to Sue Cole,

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Reprinted from *Advances in Patient Safety: New Directions and Alternative Approaches*. 2008;1.

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VICTORIA, AUSTRALIA
PATIENT AND PRESCRIBER IMPACTS

Significant health benefits can be derived from the safe and effective prescribing and use of benzodiazepines, opioids and other potentially addictive medications. However, there is also the potential for these medications to result in significant negative health and social consequences as detailed by the Parliamentary Committee. Responsible, safe and legal prescribing of medications is in the interests of the community, the medical profession generally and individual prescribers.

When the board has investigated inappropriate or dangerous prescribing, it has usually been the result of ignorance, naïveté or the inability to refuse a patient's request for medication. Regardless of the reasons for the prescribing, the consequences have often been harmful and have included:

- the death of the patient
- delayed treatment of the patient's medical condition
- substance abuse resulting in dependence or the maintenance of dependence
- social consequences for the patient, their family and others
- diversion of medication and illegal sale.

Consequences for the prescribing practitioner have included:

- gaining a reputation as a 'soft touch' in the community, and particularly by drug seeking patients who begin to dominate the practice;
- prosecution for not complying with the Drugs, Poisons and Controlled Substances Act 1981 and the Drugs, Poisons and Controlled Substances Regulations 2006;
- investigation by the Medical Practitioners Board of Victoria, including at disciplinary hearings which can generate adverse publicity;
- restriction on prescribing rights.

Medical treatment – prescriber responsibilities

Medical practitioners must only administer, prescribe, sell or supply Schedule 4 and 8 poisons:

1. for the medical treatment of a person under their care;
2. after taking all reasonable steps to ascertain the identity of the person to whom they will administer, prescribe, sell or supply S4 or S8 poisons; and
3. after taking all reasonable steps to ensure a therapeutic need exists for that drug or poison.

It is not acceptable to prescribe:

4. anabolic steroids for bodybuilding purposes or to enhance sporting performance;
5. stimulants merely to enhance or prolong wakefulness in long distance drivers;
6. additional opioids for patients receiving opioid substitution treatment from another practitioner;
7. for people who are not under the doctor's care, such as a resident in another country, or people who have not personally consulted the doctor, including internet-based prescriptions (see Board Statement: Countersigning Prescriptions for Patients Overseas).

When prescribing drugs of dependence, medical practitioners should:

- make their own assessment about whether to prescribe a drug of dependence on the basis of their clinical judgment. A drug of dependence should not be prescribed just because it has been prescribed previously.
- regularly review whether ongoing treatment with drugs of dependence is necessary.

Before prescribing a drug of dependence:

- consider whether there are other options for treatment, such as nonpharmacological treatments or non addictive pharmacological treatments
- ask what other prescribed and over the counter medications the patient is taking.

In particular, ask about any products containing codeine

- inform the patient of the potentially addictive nature

of the drug
- inform the patient of the potential side effects, consequences of drug interactions and risk of overdose
- consider whether the patient is at risk and whether strategies such as limiting amounts prescribed or arranging for small quantities to be obtained from a nominated pharmacy are indicated
- inform the patient that this is intended to be a short-term measure
- refer the patient to a relevant specialist or specialist unit for advice and management early if this is indicated.

For example, patients with chronic pain may benefit from review by a pain management specialist. It is acknowledged that waiting times for such an appointment can be lengthy but the patient will be seen sooner if an early referral is made – document in the medical record what is prescribed, the indications for prescribing and any discussions with the patient about side effects, warnings etc.

Legal requirements for prescriptions
When prescribing medication, medical practitioners must comply with the Drugs, Poisons and Controlled Substances Act 1981 and the Drugs, Poisons and Controlled Substances Regulations 2006. This is regardless of whether or not the medication is prescribed as a pharmaceutical benefit.

Failing to comply with the legislation and regulations puts practitioners at risk of prosecution as well as investigation by the board.

Prescriptions for Schedule 4 and 8 poisons must:

- contain full details of the prescriber, including name, address and telephone number
- contain the patient's name and address
- identify the medication unambiguously
- show the quantity and number of repeats in words and figures for Schedule 8 poisons
- be signed by the prescriber, preferably in a manner that prevents a patient from adding an additional item above the prescriber's signature
- contain precise directions for administration, except if directions are too complex and are provided separately in writing or if administration is to be carried out by a doctor or nurse.

Reprinted from the March 2009 issue of the *Bulletin*, published by the Medical Practitioners Board of Victoria.

ALBERTA, CANADA
INSPECTIONS OF MEDICAL PRACTICES AND OTHER CHANGES TO THE HEALTH PROFESSIONS ACT (HPA)

The *Health Professions Amendment Act* (Bill 46) was introduced on Nov. 6, 2008, passed third reading on Nov. 21, 2008, and will come into force on proclamation (no date set at this point). Some of the changes to the *Health Professions Act* (HPA) will affect Alberta physicians.

Inspections of Medical Practices
The College of Physicians and Surgeons of Alberta (College) monitoring and quality improvement programs generally take an approach that engages the physician in a conversation about his or her practice and then facilitates changes to practice, when needed. For instance, many physicians have received letters from the College about their Triplicate Prescription prescribing and have engaged in a dialogue that ended with affirmation of their current practice or with their agreement to make improvements. Our recent program focusing on the cleaning and sterilizing of reusable medical equipment in members' offices is another example.

This consensual and collaborative approach to quality improvement has worked and will continue to be the preferred way the College conducts programs to monitor practices and promote improvements.

Some time ago, we asked government to ensure that authority to operate practice improvement programs that require access to information on members' practices would continue under the *Health Professions Act* (HPA). Originally the HPA limited a college's access to information about a member's practice to circumstances of complaint investigations and to continuing competence programs (e.g. the College's PAR Program).

Government's response is an amendment to the HPA in Bill 46 giving a college the authority to inspect a member's practice to determine compliance with standards of practice and conduct without the need for a complaint investigation. Although this is not exactly what we asked for, we can accept it. Regardless of the power granted by the HPA amendment, our intent is to limit mandated inspections to the investigation of a complaint about a member's practice. Non-consensual inspections are better reserved for circumstances when they are absolutely necessary; such as when we are unable to engage a physician in a collaborative process.

Abandoned Patient Records
Bill 46 also created a new responsibility for each health profession's college – a responsibility for abandoned patient records. While not a new concept to our members, all colleges under the HPA will be required to ensure that their members have enduring arrangements in place for the care of patient records after they leave a practice. When a physician dies or otherwise leaves practice, patients' records are occasionally abandoned with no available and qualified custodian in place.

These amendments place the responsibility for safekeeping of those records on the College, which becomes the trustee unless, or until, an appropriate custodian can be found. They also provide the Courts with the ability to seize files and to impose financial liability on a member or an estate for the costs incurred by the College. Details will become clearer as the regulations are developed.

Continuing Competence Programs
Another amendment transfers the College's Physician Achievement Review (PAR) Program from the HPA to our own regulations, making its placement consistent with other professions. This change will have no impact on the way the College operates PAR.

Medical Facility Assessment Committee
Finally, amendments also transfer the authority for accrediting a medical facility from Council to the Medical Facility Assessment Committee – leaving Council with the more appropriate role as an appeal body for Committee decisions. None of these amendments will have an impact on the operations of the College until we come under that legislation, now likely late in 2009.

STANDARDS OF PRACTICE

Sometime in 2009 the Alberta government is expected to announce that the College of Physicians and Surgeons of Alberta will move from under the *Medical Profession Act* to the *Health Professions Act* (HPA).

In compliance with HPA requirements, the College recently prepared draft *Standards of Practice* for Alberta's medical profession. Most of the standards are not new. They were developed by drawing on current College policies and guidelines. These draft documents contain the minimum standards for professional behavior and practice. These standards will be a benchmark for adjudicating complaints regarding physician conduct.

During the consultation process from Sept. 1, 2008 to Nov. 3, 2008, the College received hundreds of written submissions from:

- physicians
- medical groups
- other regulatory bodies
- regional health authorities
- the public
- interest groups

We also held discussion groups in both Edmonton and Calgary. Stakeholder feedback was consolidated and reviewed by College administrative staff in preparation for presentation at Council's December 2008 meeting. Council received all of the responses as well as the consolidated document for review.

The College wants to thank all of those individuals and groups that contributed to the consultation. The input was of great value in reviewing and revising the draft *Standards of Practice*.

Given the amount of feedback received and the number of standards that required review, Council was unable to finish all of the standards at its December meeting. Council will continue its review at the March 2009 meeting.
Additional updates on the standards of practice development process will be posted on the CPSA website at www.cpsa.ab.ca/collegeprograms/standards_of_practice.asp.

Reprinted from the February 2009 issue of *The Messenger*, published by The College of Physicians and Surgeons of Alberta.

ONTARIO, CANADA

ENSURE DISCLOSURE OF HEALTH INFORMATION HAS PATIENT'S EXPRESS CONSENT

A married couple with a history of infertility was referred to an obstetrician gynecologist with an interest in infertility. The woman attended a number of preliminary sessions. Her husband then accompanied her in a follow-up visit to receive results of tests done on him.

During the course of this appointment, the doctor revealed information about the woman's sexual and fertility history that her husband had been unaware of. This led to some subsequent tension between the husband and wife. She was

distressed enough to lodge a complaint at the College of Physicians and Surgeons of Ontario (College) that the doctor had disclosed confidential information about her without her consent.

In her letter of complaint, the woman took the position that just because her husband was present, did not mean that she consented to full disclosure of information to him about her past history. She stated that the doctor's comments were inaccurate and irrelevant. In his response, the doctor wrote that he regretted some of the factual information that he gave out, nevertheless, he did not believe that the communication itself was inappropriate.

He noted that it is impossible to keep health information about a partner confidential from the other partner when investigating fertility issues. He noted that at no time had the woman indicated to him that any health or personal information was to be kept confidential from her husband.

The Committee considered the matter. It referenced the College's policy on Confidentiality of Personal Health Information. The policy states, "Situations may arise where physicians are asked by a family member or friend about the condition of a patient. Patients are permitted to restrict the disclosure of such information. For this reason, physicians will be required to obtain express consent from the patient before they are able to disclose the patient's personal health information."

The doctor noted in his response that he would not have disclosed the information had the woman "pre-warned" him and expressly directed him not to disclose it. The Committee believes that the onus was on the doctor to seek consent and not on the patient to direct him not to disclose. Thus, the Committee stated that a "more prudent and appropriate approach in this case would have been to discuss the relevance of her medical history with her alone, and to obtain her express consent to raise (the issue at hand) with her husband before actually doing so."

The Committee accepted the doctor's position that in managing infertility, the history in question might have been relevant and that fulsome and frank discussion with all the parties is best practice (with consent), but believed that the information is still privileged and confidential. The Committee thus considered it appropriate to counsel the doctor on the importance of ensuring that, in future, he will be careful not to disclose sensitive information without his patient's express consent.

A counsel is issued in circumstances where the Committee has identified an area of the member's practice that might be improved upon. It is an educative disposition, designed to guide the physician in his or her future practice.

Reprinted from the February 2009 issue of *MD Dialogue*, published by the College of Physicians and Surgeons of Ontario.

ALABAMA

IMPROVING COMMUNICATION MAY AVOID SOME COMPLAINTS TO THE BOARD

"Can my doctor fire me for asking too many questions?"

"I want to file a complaint against my doctor; his office manager treats me like dirt and won't let me talk to the doctor."

"My son's doctor told him to be quiet and learn to behave like a human being! I want his license pulled!"

This is a very small sampling of the types of calls the board office receives every day. In an average week, we receive at least 50 complaints, 90 percent of which could have been avoided with a little more patience, professionalism or awareness of the patient's educational or physical limitations.

By far, the most common complaint is rudeness on the part of the physician and/or the physician's staff. Often this is not the result of any real discourtesy to the patient but a perception on the part of the patient of being rushed, talked down to, intimidated, bullied or misunderstood. Sometimes the patient or family member does not have adequate skills to cope with these feelings, and as a result they may become angry or hostile. When this happens, they often incur the frustration and anger of the physician or staff members in the office. It is up to the physician and staff to recognize and defuse this kind of situation before it becomes a problem. There are many learning opportunities available for physicians and their employees to gain experience and communication skills that can be useful in daily practice and called upon in the case of a problem patient.

The second most frequent type of call is more avoidable (and thus less explainable) than complaints of rudeness. In this case, the complaints come from pharmacists who experience difficulty making direct contact with a physician, or someone in authority, when there is a question about a prescription. The pharmacist may have a question about the dosage strength or drug interactions, or may have important information about the patient receiving medications from other physicians. At times, the pharmacist is simply trying to ensure that the prescription is not a forgery or an attempt at forgery. In these cases, the pharmacist must be able to contact the physician in a timely manner. Most often the problem arises when a member of the physician's staff fails, or refuses, to notify the physician of the pharmacist's needs. The impact this problem has on patient care is serious and should not be minimized. Make certain that you have an acceptable procedure in place to comply with these needs and deal with such problems.

We have seen many cases where there was not such a procedure and a staff member has authorized controlled substance prescriptions, or phoned in controlled substance prescriptions, without the physician's approval. Unfortunately, some of the most trusted members of an office staff have obtained controlled substances for personal use, or for their family members, by phoning in prescriptions without the physician's knowledge, authority or approval. When this occurs, the physician should report the incidents to a local law enforcement agency or an area Drug Task Force. Such activity constitutes a Class C felony offense in Alabama and may be punishable by imprisonment and/or significant fines.

Less often, but still too frequently, we receive complaints that a physician's office repeatedly failed to call a patient back about medications, health questions, test results, etc. Evidence suggests that these are often the same medical offices that pharmacists have experienced communication problems with. Again, the need here is to develop appropriate lines of communication and procedures for taking and returning messages. It is an important part of your practice and may go a long way in helping to avoid complaints being made to our agency.

Complaints about medical records copying and transfer are very common. These issues range from patients having difficulty locating a previous provider to obtain records, to difficulties having copies of medical information transferred to a new provider. In some instances, medical offices have refused to transfer medical information or have failed to do so in a timely manner. This can interfere in the continuity of care, which could become a viable medical complaint. When a physician leaves a practice, patients

should be notified in writing about the departure, as well as the procedure for transfer of their medical information. Also, the Medical Licensure Commission must be notified of any change of address within 15 days. If you receive a request to transfer records to another physician, it is customary to waive copying charges. Requests should be honored in a timely manner. If a patient requests a copy of his or her medical record, you may charge a reasonable fee and request payment in advance, but you may not withhold medical information because of an unpaid bill for medical services. This is another area where staff persons may be short circuiting communication between patient, staff and physician. You should be aware of the procedures in your office concerning medical records transfer/copying, and whether the procedure is operating efficiently.

Another area of confusion for patients is when medical services have to be discontinued. As previously mentioned, upon a physician leaving a practice, patients should be notified in advance and when possible, in writing. If the practice is closing, the patients should be provided with as much advance notice as possible in order for them to secure another practitioner and have medical information transferred. It is when patients receive no notification, or cannot contact the physician to request medical information, that they call the medical board to complain. This can give the appearance of patient abandonment. Sometimes a patient will have to be "fired" for one reason or another – suspected drug diversion, non-compliance, unpaid bills, etc. You can discharge a patient for any reason, but you cannot do so without adequate written notice and provisional coverage while the patient is finding another physician. The provisional coverage does involve providing adequate parting medications. You cannot refuse to treat a non-discharged patient due to unpaid bills.

Our agency's staff often attempts to resolve these issues by providing the individual with pertinent information or by contacting the physician for more information. The physician's timely and full cooperation with board staff in providing the requested information is important. If we can satisfy the complainant at this stage, a formal complaint and a visit from a board investigator might be avoided.

Board issues opinion on continuing medical education exemption for retired physicians

Fully retired physicians licensed to practice medicine in Alabama may choose to claim an exemption from the minimum continuing medical education requirement mandated by state law and board rules by submitting a statement that they do not engage in the practice of medicine in any form, including the treatment of family members and the prescribing, to anyone, of controlled and/or legend drugs, and voluntarily surrendering their Alabama Controlled Substances Registration Certificate. The license status under this exemption is "active with restriction due to retirement," and the license is renewed annually at the full renewal fee. If a physician who has claimed this exemption re-enters the practice of medicine in any form at a subsequent time, application must be made for removal of the waiver status with submission of proof that the current continuing medical education requirements have been met.

Recently, the board was asked if reviewing records for Social Security or disability determination constituted the practice of medicine and required a full license with no restriction due to retirement. It is the opinion of the board that these record reviews do constitute the practice of medicine and should be performed by physicians with full licenses without restrictions due to retirement.

KANSAS

NOTICE TO CHIROPRACTORS: "PHYSICIAN" TERM

The Kansas State Board of Healing Arts has issued an official policy statement, based upon the District Court's interpretation of statutes, mandating that chiropractors shall no longer advertise or represent themselves to the public as "chiropractic physicians."

An order was issued on Aug. 15, 2008, by the board to rescind the Dec. 13, 1991, resolution that permitted chiropractors to be referred to as "chiropractic physicians." This is in accordance with the District Court's ruling in 91-CV-388. In accordance with this determination, the Kansas State Board of Healing Arts reminds all chiropractors to please discontinue all references to and advertisements with the term "chiropractic physicians."

The board has the authority to take disciplinary action if violations are found. The board will be reviewing these matters on a case-by-case basis and will be utilizing the newly adopted disciplinary guidelines if a complaint is received in this area. The Board may utilize cautionary statements and decisions as well as other disciplinary action if anyone is found to be out of compliance with this mandate.

Reprinted from volume 1 issue 1 of the State Board of

Kansas Healing Arts News, published by the Kansas State Board of Healing Arts.

KENTUCKY

BOARD ADOPTS OPINION ADDRESSING COLLABORATIVE AGREEMENTS WITH ARNPS

The board, at its September 2008 meeting, adopted an opinion regarding the standards of acceptable and prevailing medical practice for physicians involved in collaborative agreements with ARNPs. The Kentucky Medical Association, on behalf of its members, asked the board to issue this opinion in order to provide guidance to any physician who intends to enter or does enter into a collaborative agreement with an ARNP.

The board issued this opinion pursuant to KRS 311.602, to assist licensees in determining what actions would constitute unacceptable conduct under the provisions of KRS 311.595. The board decided to publish this opinion because it addresses issues of significant public and medical interest.

This opinion is not a statute or administrative regulation, and does not have the force of law. A copy of this opinion by may be viewed or downloaded by visiting the board's website, www.kbml.ky.gov.

TRAMADOL LISTED AS SCHEDULE IV CONTROLLED SUBSTANCE IN KENTUCKY

In response to significant concerns raised by health care professionals, the Kentucky Cabinet For Health and Family Services, Office of the Inspector General, Division of Audits and Investigations, Drug Enforcement and Professional Practices Branch submitted a request to the Kentucky Legislature to modify regulation 902 KAR 55:030 to add Tramadol to the list of Schedule IV controlled substance products in Kentucky.

The regulation change was adopted and became effective on Dec. 5, 2008. At that time any prescriber without a valid DEA license cannot write or issue a prescription for Tramadol. In addition, any remaining refills on a Tramadol prescription issued by a prescriber without a valid DEA license may not be dispensed.

It is important for all physician assistants to be aware that as of Dec. 5, 2008, they are not able to write prescriptions for Tramadol or Tramadol containing products.

Following are additional actions that should be taken by controlled substance dispensers, distributors and wholesalers, along with the appropriate statutory references.

Controlled substance dispensers must adhere to KRS 218A.200 (7)(b):

"A substance which is added to any schedule of controlled substances and which was not previously listed in any schedule shall be initially inventoried within thirty (30) days of the effective date of the statute or administrative regulation which adds the substance to the provisions of this chapter. Thereafter, the substance shall be included in the inventory required by paragraph (a) of this subsection."

Controlled substance dispensers must report all dispensing of Tramadol to the Kentucky All Schedule Prescription Electronic Reporting (KASPER) system (KRS 218A.202 (3). Questions regarding this regulation change, please contact the Drug Enforcement and Professional Practices Branch at (502) 564-7985.

EAR STAPLING

In recent months, it has been brought to the board's attention that various beauty salons throughout the commonwealth are advertising the availability of "ear stapling."

It is the opinion of the board that the practice of "ear stapling" – the stapling of the external cartilage of the ear to assist in weight loss, smoking cessation, insomnia and other conditions – falls within the statutory definition of "the practice of medicine," as outlined in KRS 311.550(10).

The board further cautions that it is not aware of any evidence that "ear stapling" has any medically appropriate or effective therapeutic effect on any of these medical conditions.

Reprinted from the winter 2009 issue of the *Kentucky Board of Medical Licensure Newsletter,* published by the Kentucky Board of Medical Licensure.

NEW HAMPSHIRE

NEW LAWS

329:26 Confidential Communications. *Effective Sept. 5, 2008*

The confidential relations and communications between a physician or surgeon licensed under provisions of this chapter and the patient of such physician or surgeon are placed on the same basis as those provided by law between attorney and client, and, except as otherwise provided by law, no such physician or surgeon shall be required to disclose such privileged communications. Confidential relations and communications between a patient and any person working under the supervision of a physician or surgeon that are customary and necessary for diagnosis and treatment are privileged to the same extent as though those relations or communications were with such supervising physician or surgeon. This section shall not apply to investigations and hearings conducted by the board of medicine under RSA 329, any other statutorily created health occupational licensing or certifying board conducting licensing, certifying or disciplinary proceedings or hearings conducted pursuant to RSA 135-C:27-54 or RSA 464-A. This section shall also not apply to the release of blood **or urine** samples and the results of laboratory tests for **drugs or** blood alcohol content taken from a person **for purposes of diagnosis and treatment in connection with the incident giving rise to the** investigation for driving a motor vehicle while such person was under the influence of intoxicating liquors or controlled drugs. The use and disclosure of such information shall be limited to the official criminal proceedings. (New sections of this law are in bold print)

329:1-c Physician-Patient *Relationship* *Effective Jan. 1, 2009*

"Physician-patient relationship" means a medical connection between a licensed physician and a patient that includes an in-person exam, a history, a diagnosis, a treatment plan appropriate for the licensee's medical specialty, and documentation of all prescription drugs including name and dosage.

Exceptions: Writing admission orders for a newly hospitalized patient: for a patient of another licensee for whom the prescriber is taking call: for a patient examined by a physician assistant, nurse practitioner, or other licensed practitioner: or for medication on a short-term basis for a new patient prior to the patient's first appointment or where providing limits treatment to a family member in accordance what the AMA Code of medical Ethics.

Providers will need to have a full evaluation of the patient including a face to face meeting for prescriptions, with exceptions noted above.

329:16-g Continuing Medical Education Requirement
Effective August 25, 2008
As a condition of renewal of license, the Board shall require each licensee to show proof at least at every biennial license renewal that the licensee has completed 100 hours of approved continuing medical education program within the preceding 2 years.

Renewal of license is now every two years and CME, instead of requiring 150 hours every three years, is now 100 hours every other year.

Reprinted from the January 2009 issue of *Newsletter*, published by the New Hampshire State Board of Medicine.

CRIMINAL LAW

United States v. Awad,
No. 06-50578 (9th Cir. Jan. 12, 2009)

The Ninth U.S. Circuit Court of Appeals affirmed the criminal conviction of a physician on charges of Medicare fraud and related counts of money laundering.

An audit conducted by Medicare of the billing practices of Aziz F. Awad, M.D., revealed numerous irregularities, including the discovery that Dr. Aziz was billing 14 times the number and 18,000 times the amount than that of the next highest biller in Southern California for one treatment, and 28 times the number and 42,000 times the amount of the next highest biller for another treatment.

Dr. Awad was criminally charged and convicted of 24 counts of participating in a scheme to defraud Medicare and four counts of money laundering involving the proceeds of health care fraud (see 15 *HLawWk* 618, Oct. 13, 2006). Aziz appealed his conviction.

The Ninth Circuit rejected Dr. Awad's contention that his indictment charged a single offense in more than one count, rendering it impermissibly multiplicitous. Under applicable U.S. Supreme Court precedent, each fraudulent claim submitted to Medicare was capable of forming the basis of a separate count. Moreover, the Ninth Circuit held that each submission of a fraudulent claim to a health care benefit program, rather than being simply an act in furtherance of a larger scheme to defraud, was a separate execution of the scheme, and was itself chargeable as a separate count.

Dr. Awad owed a new and independent obligation to be truthful each time he submitted one of the 24 fraudulent claims included in the indictment, the Ninth Circuit concluded. Accordingly, the indictment was not multiplicitous.

The Ninth Circuit also rejected Dr. Awad's contention that a two-level sentencing enhancement for conduct involving "conscious or reckless risk of death or serious bodily injury," was inappropriately applied to his case. Dr. Awad authorized numerous respiratory treatments that were not required, and that involved the inhalation of medications. Medicare required a treating provider to be present at the facility when a treatment was given, indicating a recognition that the provider's immediate attention might be required. Because Dr. Awad was present for none of the treatments, he placed each patient at risk. The conviction was accordingly affirmed.

EXPERT TESTIMONY

Estate of Ford v. Eicher,
No. 06CA1625 (Colo. Ct. App. Dec. 11, 2008)

The Colorado Court of Appeals reversed a trial court's medical malpractice judgment and remanded the case for a new trial after finding that the trial court abused its discretion in precluding defense experts from expressing opinions regarding causation.

Danny Eicher, M.D., delivered baby Catherine, who was diagnosed with a brachial plexus injury to the right shoulder. The estate that was established for the baby brought a medical malpractice action against Dr. Eicher and Consultants in Obstetrics and Gynecology P.C. (collectively, Dr. Eicher) alleging Dr. Eicher failed to properly inform Catherine's parents about the risks of a vaginal birth as opposed to a Caesarian section, and that he applied excessive traction to deliver the baby, causing injury.

The jury returned a verdict in favor of the estate, and the trial court entered judgment accordingly. Dr. Eicher appealed on the grounds that the trial court abused its discretion in granting the estate's pretrial motion to preclude his two defense experts— Drs. Joseph Ouzounian and Theodore Cooper—from expressing opinions regarding the cause of Catherine's injury.

The appeals court reversed the trial court's judgment and remanded the case for a new trial. The trial court applied an incorrect legal standard in ruling that Ouzounian's tes-

timony was scientifically unreliable. Instead of evaluating whether the theory propounded by Ouzounian was reasonably reliable, as required by *People v. Shreck*, 22 P.3d 68 (Colo. 2001), the trial court determined which medical theory of causation was more plausible.

The appeals court concluded the trial court abused its discretion in not allowing Ouzounian to present his opinion regarding the cause of Catherine's injury, and such error caused substantial prejudice to Dr. Eicher. Based on the same reasoning, the appeals court found that the trial court abused its discretion in precluding Cooper from expressing his opinion regarding causation.

Geesling v. Livingston Reg'l Hosp. L.L.C.,
No. M07-02726-R3-CV (Tenn. Ct. App. Dec. 18, 2008)

The Tennessee Court of Appeals affirmed a trial court's grant of summary judgment to a hospital sued for medical malpractice, finding an estate's sole expert witness failed to meet statutory requirements.

Sharon Geesling, a disabled 56-year-old woman, was admitted to the emergency department at Cumberland River Hospital Clay County Adult Services (CCAS) due to possible neglect after Geesling was found in her home by CCAS dehydrated and with missing medications. She was transferred to the Livingston Regional Hospital Emergency Department where Larry M. Mason, M.D., made an initial diagnosis of adult neglect. She was subsequently transferred to Livingston for admission and to obtain an adult protective services evaluation/consult.

While at Livingston, Geesling was taken via wheelchair to be weighed. Upon return to her room, she informed nurse Melanie Moore that she did not want to return to bed just yet. An hour later, Geesling was found laying on her right side on the floor of her room, with a laceration to her right eye, edema in her right orbital area, and with two fingers bruised. She was subsequently transferred to Cookeville Regional Medical Center, where she died.

Geesling's husband, Thomas, individually and on behalf of Geesling's estate, brought a medical malpractice action against Livingston. The complaint alleged that Livingston's nursing staff violated the applicable standard of care, thereby causing Geesling's fall and death.

The trial court found that the affidavit from nurse Cindy Wilson, the plaintiff's sole medical expert, did not satisfy the requirements for competency and admissibility under Tenn. Code Ann. § 29-26-115 and was therefore inadmissible. The court granted Livingston's motion for summary judgment, holding that the plaintiff failed to create a genuine issue of material fact to effectively oppose Livingston's motion. The plaintiff appealed.

The appeals court affirmed the trial court's judgment. As set forth in § 29-26-115, a plaintiff in a medical malpractice action must produce expert evidence to establish the standard of professional care in the community in which a defendant practices or in a similar community. This is known as the locality rule.

Upon reviewing the record in this case, the appeals court found that the trial court did not err in holding that the plaintiff failed to meet the requirements of § 29-26-115. In her affidavit, Wilson stated that she was employed by Cumberland Medical Center in Crossville, Tenn. Wilson further stated that she was familiar with the standard of care for hospitals in the Upper Cumberland Community — the region where she had practiced nursing for the last 27 years. While Wilson stated a familiarity with the Upper Cumberland region, her affidavit did not state that she was familiar with the standard of care in Livingston, Tenn. Nor did Wilson state that Livingston and Crossville were similar communities for purposes of the locality rule.

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