

Proceedings

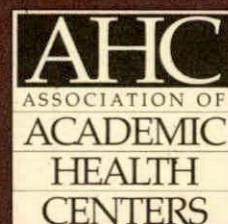
7th CONGRESS *of* HEALTH PROFESSIONS EDUCATORS

June 8-9, 2000

Washington, D.C.



**Educating
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Health
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Professionals
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to Enhance
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Quality and
—
Safety**



Educating Health Professionals to Enhance Quality and Safety

Proceedings of the 7th Congress of Health Professions Educators

Elaine R. Rubin

Editor

June 8-9, 2000

Washington, DC

The Association of Academic Health Centers (AHC) is dedicated to improving the health of the people by advancing the leadership of academic health centers in health professions education, biomedical and health services research, and health care delivery.

The AHC is a national, nonprofit organization comprising more than 100 institutional members in the United States that are the health complexes of the major universities. Academic health centers consist of an allopathic or osteopathic school of medicine, at least one other health professions school or program, and one or more teaching hospitals. These institutions are the nation's primary resources for education in the health professions, biomedical and health services research, and many aspects of patient care.

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Voice 202/265-9600

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CONTENTS

FOREWORD	v
PREFACE	vii
1. CELEBRATING ERROR: COMPETENCIES FOR QUALITY IMPROVEMENT	1
Lois L. Kercher, DNSc, RN	
2. DESIGNING A CHASSIS: A NEW FRAMEWORK FOR HEALTH	7
Molla S. Donaldson, DrPH	
3. REDUCING DRUG-RELATED MORBIDITY AND MORTALITY	17
J. Lyle Bootman, PhD	
4. EDUCATORS RESPOND AND REACT: PANEL OF NURSE, PHARMACIST, AND PHYSICIAN EDUCATORS	25
Janis P. Bellack, PhD, RN, FAAN	
Doyle M. Cummings, PharmD	
Vincent A. Fulginiti, MD	
5. FEDERAL AGENCY RESPONSES TO THE CHALLENGES OF QUALITY AND SAFETY	35
Howard Holland	
6. UME-21: A NEW CHAPTER IN HEALTH PROFESSIONS EDUCATION	41
Douglas L. Wood, DO, PhD	
7. HEALTH PROFESSIONS EDUCATION AND THE FEDERAL QUALITY INITIATIVE	47
Neil H. Sampson, MPH, MGA	
8. A PANACADEMIC HEALTH CENTER REFLECTION ON QUALITY AND SAFETY	55
James W. Holsinger Jr., MD, PhD	

FOREWORD

On behalf of the Association of Academic Health Centers and the Center for Interdisciplinary Community-based Learning, I am pleased to present the proceedings of the *7th Congress of Health Professions Educators*. We trust it will serve as a useful reference for anyone interested in health professions education and the shaping of health care delivery for the future.

The congress was established in 1993 by the Association of Academic Health Centers to provide a forum for discussing the future of health professions education and practice and to promote and foster collaboration and interdisciplinary activities among the health professions schools within academic health centers. Over the years, the congress has become a major vehicle for exposing administrators and educators to current and emerging policy issues and trends that bear on the education and deployment of the health care workforce.

Quality and safety have always been paramount concerns for all health care professionals. In recent months, the media has brought new attention to these issues with reports about medical error, particularly with regard to drug safety. The focus on quality also highlights the fact that the problems that surround the task of ensuring drug safety and quality care are not the sole responsibility of physicians, nurses, or other health professionals. These are complex system problems that confront us. To best resolve these problems, there should be a marriage of the professions, the public, and the patients. In this way, we can overcome the financial and other social obstacles to improving and enhancing health care delivery.

This congress is an ideal venue for thinking about these issues and developing some creative options and advances.

We thank The Robert Wood Johnson Foundation for its generous support of the congress and this publication. Special thanks go to Elaine R. Rubin, PhD, associate vice president for program at the Association of Academic Health Centers and acting director of the Center for Interdisciplinary Community-based Learning, who brought her knowledge of interdisciplinary health care and education to her work as editor of this volume. Special thanks also go to the volume's contributors and the congress participants. Without their efforts, this book would not have been possible.

Finally, we would also like to acknowledge the contribution of Denise E. Holmes, JD, MPH, director of the Center for Interdisciplinary Community-based Learning and liaison to the American International Health

Alliance; Geraldine Bednash, PhD, RN, FAAN, executive director of the American Association of Colleges of Nursing; and Richard P. Penna, PharmD, executive vice president of the American Association of Colleges of Pharmacy for their contributions to developing the program and making the congress a reality this year.

I also thank the Health Resources and Services Administration, U.S. Department of Health and Human Services, for supporting and promoting interdisciplinary work throughout the nation and its support for the Center for Interdisciplinary Community-based Learning, the umbrella for AHC's interdisciplinary activities.

—Roger J. Bulger, MD
President
Association of Academic Health Centers

PREFACE

Educating Health Professionals to Enhance Quality and Safety brings together in one volume the papers presented at the 7th Congress of Health Professions Educators, an annual, national gathering of dentists, nurses, pharmacists, physicians, physician assistants, and other health professions administrators and educators sponsored by the Association of Academic Health Centers. This year's congress focused on safety and quality issues in health care delivery systems. The catalyst for this theme was the recent publication, *To Err is Human: Building a Safer Health System*, by The Institute of Medicine, a report on medical errors that touched a nerve with the American people. At issue at the conference were the concerns related to developing competencies for teaching the next generation of health professionals if they are to improve or change the current system of care so that errors are eliminated.

A videotaped presentation narrated by Donald Berwick of the Institute for Healthcare Improvement set the stage for the conference. His story centers around a sudden, critical, and mysterious illness that befell his wife and his subsequent confrontation with the world of quality care, medical errors, medical traditions and culture, and current systems of patient care. The videotape depicts the complex, often troubling nature of health care where people, information (or the lack thereof), and organizational structures and cultures can work together to both help and harm the patient.

In this compilation of the papers that followed, physicians, nurses, pharmacists, and other health professions educator-administrators present multiple personal, professional, and political viewpoints on a range of education and health care delivery issues needing improvement. They describe a changing health care world in which both public and private demands are affecting the development of public policy and, ultimately, the future course of health professions education. A number of authors also share new insights and raise concerns about emerging challenges in both the regulatory and legislative arenas.

Lois L. Kercher, vice president and nurse executive at Virginia Beach Central Hospital, Sentara System, talks about the need to learn from mistakes, and the skills and competencies that future clinicians will need to bring to this task. Molla S. Donaldson, coeditor of *To Err is Human*, puts the report into a larger context, shares some of the outcomes, and also addresses a framework of the health care system that is emerging from her work at The Institute of Medicine. The incidence and cost of medical errors, and the special need to focus on reducing errors in ambulatory and long-term care settings, is the contribution of J. Lyle Bootman, dean of the School of Pharmacy at the University of Arizona.

Drawing on their expertise in interdisciplinarity, a panel of clinician educators and administrators, Vincent A. Fulginiti, Janis P. Bellack, and Doyle M. Cummings, react to conference presentations, offering cogent council on how health professions educators can work with students across the disciplines to enhance safety and quality. Dr. Fulginiti is affiliated with Children's Hospital at the University of Colorado Health Sciences Center, Dr. Bellack with the Medical University of South Carolina, and Dr. Cummings with the Office of Interdisciplinary Health Services Education at East Carolina University.

An overview of Federal initiatives to set standards and expectations for improved safety practices, plus suggestions on how academic health centers can contribute to this effort, emerge from presentations by Howard Holland representing the Agency for Healthcare Research and Quality, and Neil H. Sampson from the U.S. Bureau of Health Professions, Health Resources and Services Administration.

Douglas L. Wood, president of the American Association of Colleges of Osteopathic Medicine, shares with us the ways in which quality issues play into UME-21, a five-year demonstration project of the association that encourages educational partnerships in the health professions.

Finally, James W. Holsinger draws on his experience as CEO of an academic health center and previous professional background as undersecretary for health at the U.S. Department of Veterans Affairs, to offer a panacademic health center perspective on the quality and safety issues discussed at the congress.

Bringing the differing philosophies and cultures of their professions to the fore, the authors all call for collaboration and integration within systems, as well as multiprofessional approaches to finding solutions. It is this interdisciplinary outlook that we hope will dominate future discussions not only within academic health centers and other educational institutions throughout the country but also in the public policy arenas.

—ERR

CONTRIBUTORS

Janis P. Bellack, PhD, RN, FAAN, is associate provost for education programs at the Medical University of South Carolina.

J. Lyle Bootman, PhD, is dean of the School of Pharmacy at the University of Arizona.

Doyle M. Cummings, PharmD, is co-director of the Office of Interdisciplinary Health Services Education at East Carolina University.

Molla S. Donaldson, DrPH, is senior program officer for the Board on Health Care Services at The Institute of Medicine.

Vincent A. Fulginiti, MD, is professor of pediatrics and preventive medicine/biometrics for Children's Hospital at the University of Colorado Health Sciences Center.

Howard Holland is public affairs specialist for the Division of Public Affairs, Agency for Healthcare Research and Quality.

James W. Holsinger Jr., MD, PhD, is chancellor for the medical center at the University of Kentucky.

Lois L. Kercher, DNSc, RN, is vice president and nurse executive for Virginia Beach Central Hospital, Sentara System.

Elaine R. Rubin, PhD, is associate vice president for program, Association of Academic Health Centers, and acting director of the Center for Interdisciplinary Community-based Learning.

Neil H. Sampson, MPH, MGA, is deputy associate administrator of the Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health and Human Services.

Douglas L. Wood, DO, PhD, is president of the American Association of Colleges of Osteopathic Medicine.

1

CELEBRATING ERROR: COMPETENCIES FOR QUALITY IMPROVEMENT

Lois L. Kercher, DNSc, RN

The most important reason physicians and nurses have not developed more effective methods of error prevention is that they have a great deal of difficulty in dealing with human error when it occurs. The reasons are to be found in the culture of medical practice, and I submit to you that we can say the culture of any professional clinical practice. Physicians are socialized in medical school and residency to strive for error-free practice. There is a powerful emphasis on perfection both in diagnosis and treatment. In everyday hospital practice, the message is equally clear: mistakes are not acceptable.

—Lucien Leape, 1994

In this paper, I examine three issues: Why is medical error and patient safety a topic of particular interest today? What is the new culture we now seek? How will we achieve our objectives? My perspective is one of a nurse who has become an executive, and my world is a practitioner's world although I feel close to education.

WHY PATIENT SAFETY IS A TOPIC TODAY

Some people attribute the admonition, "First, do no harm," to the oath of Hippocrates or to the Florence Nightingale pledge. Actually, the exact words, "First, do no harm," are not in either document.

The Hippocratic oath for physicians reads: "I will follow the regimen which, according to my ability and judgment, I consider for the benefit of my patients and abstain from whatever is deleterious or mischievous."

A similar phrase is in the Florence Nightingale pledge: "I will abstain from whatever is deleterious and mischievous and will not take or knowingly administer any harmful drug." "Will not *take* any harmful drug." Nightingale was definitely ahead of her time.

Discussing the growing interest in medical error, Lucien Leape, a well-known researcher at the Harvard School of Public Health and a prolific author on the subject, states that "the new momentum is profoundly welcome After all, numerous past warnings based on research results went relatively

unheeded. A critical mass appears now to have been reached. Indeed, it may be fair to say that a deep cultural shift on this issue is underway." He adds that he has been waiting for a long time.

What events led to this critical mass of interest in medical error? The first was the interaction between the Institute for Safe Medication Practices (ISMP) with regulatory agencies, professional organizations, practitioners, and health care institutions and the pharmacy industry. To fulfill its mission of educating and encouraging voluntary reporting of medical errors, the ISMP has tried over a number of decades to make us aware of safe medication practices.

Next is the 1994 Lucien Leape article on error in medicine in the *Journal of the American Medical Association*.^{*} It presented a good bibliography on some of the research that suggested much medical error may be unrecognized.

Third, in 1997, the Joint Commission of Accreditation of Health Care Organizations (JCAHO) issued its first policy on sentinel events, yet another event building to this critical mass.

Fourth, the Institute for Healthcare Improvement (IHI) has conducted a number of collaborative projects on preventing adverse drug events.

Fifth, the 1998 report of the Advisory Commission on Consumer Protection and Quality in the Health Care Industry, established by Executive Order of President Clinton in 1996, included an entire chapter on patient safety and error reduction. However, it did not get much attention from the press.

In sharp contrast, the next major event, the Institute of Medicine (IOM) report, with its analogy of the toll of two 747 airplane crashes per week equaling the number of people estimated to die as a result of medical error inside our hospitals, generated headlines.

Finally, the American Hospital Association (AHA) recently decided to conduct a self-assessment survey in every hospital across the country. The survey on how the hospital handles medications was addressed to the chief pharmacist in the hospital and was filled out by a team of people who handle medications.

WHAT IS THE NEW CULTURE WE SEEK?

Of course, some voices across the country say, "Yes, that happens across town but not in my hospital." These are isolated voices, I hope. In the new culture we now seek, we assume that errors will occur, that they have system causes, and that they require system solutions. To flush out the errors and get increased reporting and learn from errors rather than react to errors, we need a nonpunitive, nonblame response. Clearly, errors happen in every hospital.

John Nance, an aviation news analyst for a major network, delivered a powerful speech at the 1999 National Forum on Quality Improvement in Health Care sponsored by the IHI. Nance relates story after story of how the

^{*} L.L. Leape, Error in medicine, *Journal of the American Medical Association* 272 (1994): 1851-1857.

aviation industry learned from its mistakes and changed its culture over the last 20 to 30 years. (When they make a mistake, it appears in the headlines.)

Crew resource management in the airline industry consists of teamwork that requires everybody to watch everybody else, regardless of rank or title. Nance describes a pecking order among airplane crews, where the pilot is number one, almost like the senior surgeon. Nance draws analogies with the senior surgeon walking into the operating room. When can a resident or scrub nurse say to this surgeon, "Ah, Surgeon, I am not sure that is what you want to do next"? Nance advises that there were many times in the cockpit when this kind of admonition was absolutely prohibited.

One of the findings in the Institute of Medicine report, *To Err is Human: Building a Safer Health System*, is that the strongest variable relating to positive patient outcomes is the relationship and the communication between the doctors and the nurses.

ENCOURAGING REPORTING TO REDUCE ERRORS

My hospital, Virginia Beach Central Hospital, part of a system with five other hospitals, is unique. We are community-based with tertiary services (open-heart surgery, neonatal intensive care unit, high risk OB, radiation, oncology, etc.) We have very few residents. A few years ago, after participating in an IHI study on preventing adverse drug events, we began to turn our culture around. We started by looking at our policies.

We have never had a restricted policy at the hospital stating that if you make one medication error, you are suspended; if you make two medication errors, you are put on probation; if you make three medication errors, you are out the door. However, neither did we have anything worded positively, indicating that we want staff to report their errors and, "by the way, nothing will happen to you."

There is still a pervasive dark cloud over our industry relative to people's concerns about what is discoverable and the litigious environment. Most of our medical staff say they would be willing to talk about events that might be related to error but for the fact that the moment they say something, they become vulnerable and at risk of being sued.

Thus, our first step was to draft a policy that has since been carried out across all six hospitals. The preamble says:

We know that to reduce error we have to know what errors occur because errors are system problems not people problems. We will not react to the error; we will learn from it.

We encourage reporting and, as a result, have increased our reporting by about 40 percent. We are trying to increase it by 100 percent. Most hospitals probably only know about 5 or 10 percent of the medication errors in their hospital. We want to get much more reporting so we can try to understand why things happen and how we can fix them.

At the start, I worked with groups of managers and ran focus groups. One of the first activities was to show the movie *Beyond Blame*. It is a short movie about a young Florida boy who, several years ago, was given the wrong medication in the operating room. The boy, who was having elective ear, nose, and throat surgery, died. The risk manager and the hospital executives went to the family, admitted the error, and the family agreed to a settlement. The family also asked that the rest of the country learn from this error. In this powerful video, the surgeon, anesthesiologist, and the others involved speak about the experience and how it affected them.

In the video, a nurse also talks about inadvertently injecting potassium chloride in a patient because she did not realize it was potassium chloride. I personally have had to deal with a staff member who picked up a vial of KCl thinking it was Lasix; the two looked the same and were sitting together. This is a nurse executive's nightmare, and also a nightmare for the staff nurse. In his videotaped speech, John Nance notes that in the old days, if a pilot who may have made a mistake survived the crash, that pilot would have never flown again. Nance's comment: "That pilot is the one *least* likely to make another mistake!"

As we began to change the culture at our institution, the managers would say they now understood what we were doing. If someone worried about a staff person who did not necessarily practice according to standards (thus leaving no paper trail documenting use of medications), we would say that that individual would either have to demonstrate improvement or leave.

We would go on to point out, however, that if we are to flush out all medication errors, we need a hands-off policy relative to every kind of personnel action. In my opinion, sloppy practitioners can be made evident through many other ways of observing their practice. It is evident in their communication, in their documentation, and in the way they do not follow policy and procedures in general. Stay away from punishing for medication errors. I ask staff, "So, are there any medication errors that you can tell me about today?"

In the beginning, people were taken aback. Now I think we have an environment where people understand that we are serious about getting more reported error, and we are seeing patterns and trends. For example, we suddenly realized that we had problems with orders that specified more than a 24-hour interval between doses. Our system was not set up to accommodate the every-36-hour medication administration. This is the kind of culture change we are now trying to effect, but such a change is not done overnight.

HOW WILL WE ACHIEVE OUR OBJECTIVES?

Safety will come to be a priority if we make it a personal commitment. We have to share what we are doing with professional peers and try to do better in terms of making a safer environment.

We also should make a visible commitment to patient safety by establishing a permanent committee dedicated to safety improvement. The committee

could then develop a curriculum on patient safety and encourage its adoption into training and certification requirements.

A final suggestion on how to make patient safety a priority is to remember the publicity. The Dana Farber Cancer Institute learned to turn around its medication error and the resulting publicity by becoming champion for a safe environment.

I tell my peers that it is important to remember that honest, good, competent, compassionate people make mistakes. According to John Nance, some of the pilots who had serious aviation accidents were also some of the best in the business.

I think we always do a little better when we are being watched. I think we had better acknowledge that the public is watching us like they have never watched us before. We have to make patient safety a priority because we have to perform to their expectations.

The Role of Leadership

I take it for granted that the people who walk across the threshold of my hospital every day want to do things right. My job is to take away the barriers that get in the way of their doing things right. It is not merely to sit in a room and look at reports telling me that the seventh floor had more mistakes last month than the sixth floor. It is to go up to the seventh floor and see how I can help staff make the system safer.

I need to see the number of reported errors to go up so I can figure out why errors are happening. I can then make system changes—and they are not easy to make. I believe that when the system changes, the error rate will go down.

Involving the People We Serve

My last suggestion is that we involve the people we serve—patients and their families. At my institution, for example, we are developing a brochure for our patients, *Asking Questions Is Good for Our Health*.

In *Business @ the Speed of Thought*, Bill Gates says that the 1980s were about quality. In the 1990s, it was about reengineering. Gates predicts that the first decade of this millennium will be about velocity. This is a good development. We are very concerned about doing something quickly and now we have the ability to disseminate information more rapidly than ever. To make patient safety a priority, we must act quickly. I hope we really make a difference, and I hope it happens before I retire.

2

DESIGNING A CHASSIS: A NEW FRAMEWORK FOR HEALTH

Molla S. Donaldson, DrPH

The Institute of Medicine (IOM) is a private, not-for-profit national organization chartered by Congress.* It is composed of individuals elected on the basis of distinction and achievement in their own particular fields, not only in medicine, but also in a gamut of areas (e.g., nursing, health economics, and health law) in which people who write and think about health care are active.

Committed to advancing the health sciences and education and to improving health care, IOM works primarily through a series of formally constituted committees or blue ribbon panels. The committees are charged to look into specific areas over a period of usually about eighteen months, hold numerous meetings, and issue a report. People are asked to serve on these committees by virtue of their expertise and not as representatives of a given organization.

The purpose of this paper is to present some ideas coming from an IOM subcommittee that is looking at how to design a new health system for the twenty-first century. Some background follows.

THE FIRST STEPS

IOM's Governing Council launched its initiative on quality health care after the failure of national health reform. At the time, it was felt that the issue of quality of care had fallen off the table in the first nine nanoseconds of discussion. The result was the National Roundtable on Health Care Quality, based on the premise that we have much to learn from those industries that have greatly improved the quality of their services or products.

The roundtable was chaired by Dr. Mark Chassen of the Mount Sinai Medical Center and cochaired by Robert Galvin, the former chief executive officer of Motorola. I was study director. Because Federal government representatives from such agencies as the Department of Defense, Health Care Financing Administration, and the Department of Veterans Affairs served on the roundtable, we issued a consensus statement instead of

* IOM is part of the National Academy of Sciences (NAS) chartered by President Abraham Lincoln.

recommendations, which might have been perceived as being directed at the government. The statement was published in the *Journal of the American Medical Association* in September 1998.

Our main conclusion was that serious and widespread quality problems exist in American medicine and health care. These problems, which can be classified as underuse, overuse, or misuse, occur in small and large communities alike, in all parts of the country, and with approximately equal frequency in managed-care and fee-for-service systems. Large numbers of Americans are harmed as a direct result. The roundtable members also believed that currently there were no examples of high quality institutions that, across the board, reliably and consistently provide high quality care in every health field.

Once the roundtable finished its work, the IOM Governing Council wanted to organize some formal committees to address the quality issues cited in the roundtable's consensus statement. One of these was the National Cancer Policy Board, which issued a report, *Ensuring Quality Cancer Care*, this past year.

Currently, the major activity of the IOM quality initiative now is the Committee on the Quality of Health Care in America, chaired by William Richardson, chairman and chief executive officer of the Kellogg Foundation. The committee's goal is to provide leadership and strategic direction that will contribute to raising the threshold in the quality of health care substantially.

In a series of conferences, including one on information technology and quality, the committee has thus far looked at ways to communicate with the public about quality, the relationship between payment methods and quality, and how payment methods can be devised to serve as an incentive to improving quality. We have also examined the relationship between volume and outcomes and the kinds of policy decisions that could emerge from what we know about this relationship.

The committee's first report, *To Err is Human: Building a Safer Health System*, came out in December 1999. The information in the report is not brand new. Instead, the report highlights findings from a number of new studies, and then brings them together with some policy recommendations.

The recommendations received widespread coverage and were reviewed and endorsed by President Clinton. The recommendation to set up a Center for Patient Safety is currently being implemented at the Agency for Healthcare Research and Quality. In addition, many other organizations tell us that they have resumed efforts or been refreshed in their efforts to improve patient safety.

Four major issues emerged from the report, as follows:

1. The human cost of medical errors is unacceptably high. We believe that the numbers we cite radically underestimate the cost of error, in part because the studies were based only on what is in the medical record (so much does not get into the medical record) and on hospital care (a vast amount of care is taking place in outpatient settings and surgical suites, where virtually nothing is known about the error rates). Even an error rate of one-half of one percent would result in the deaths of thousands of people.

2. The majority of human errors arise from a lack of adequate systems of care. To prevent such harm, we need a culture of safety, not a culture of blame. And we need clear leadership at every level of the health professions so that we can improve safety both throughout health care organizations and in terms of certifying every form of health care organization.
3. Both voluntary and mandatory reporting systems are necessary, and the voluntary system should have peer-review protection. The purpose is to understand where errors are occurring rather than just collating, coding, codifying, or reporting errors. We need to make an adequate analysis of these errors and also put in place the resources to prevent harm from occurring.
4. We need to balance the public accountability for those egregious errors that will become known anyway. The patients know about them and the family knows about them. It is clearly not the intent of the report to reduce accountability. In fact, the report increases accountability because it holds that professionals are accountable for understanding errors, finding out about them, telling patients about them, and preventing them. At the same time, we need a safe harbor for learning about error.

THE CHASSIS COMMITTEE

The Committee on the Quality of Health Care in America has formed a subcommittee to look at how to design a health system for the twenty-first century. Chaired by Donald Berwick, president and chief executive officer of the Institute for Health Care Improvement, we are informally known as "the chassis committee." At our roundtable conferences, we had discussed ways in which quality can be improved through regulation, competition, continuous improvement, payment systems, and various other methods. At one point in the discussion, David Lawrence, chief executive officer of the Kaiser Foundation Health Plans, spoke up: "You know," he said, "we are just tinkering with the fit and finish when, in fact, the chassis is broken." In other words, although we have enormous engines of technology that are increasing knowledge about patient care and the ways in which we can affect it, we do not have systems that can deliver such care reliably and safely.

The work of the "chassis committee" has now moved to the full committee. We have not yet signed off on the ideas that follow, but believe they will ultimately underpin some of our final recommendations.

COMPLEXITY THEORY: A MODEL FOR THE FUTURE

The framework for the committee's work is based on the complexity theory, the theory that concerns the behavior of complex, adaptive systems (e.g., health care systems) composed of interdependent parts. The interdependent parts of the health care system, for example, include caregivers and patients who are bound together by a common purpose and act on the knowledge available at their own organization or within the small groups in which they work. The caregivers and patients also have a large number of interconnections with other systems. These complex systems are adaptive because

they are made up of people, not mechanical things. They have the capacity to learn and change as a result of experience. Their actions are not always predictable, but when they act, they tend to change their own environment and even the larger environment.

Some of the actions a complex system must take to improve its performance can be specified quite well. Such actions should be predictable and have a very high level of reliability. Other actions are not specifiable in detail because their relationship to outcomes is not so well understood; in this case, overspecifying actually damages quality.

Figure 1 is an attempt to describe complex adaptive systems in a two-dimensional plane. It was adapted from the work of Ralph Stacey, who is at the University of Kentucky. "Plan and Control" represents areas of relatively high agreement—socially, politically, and professionally—on those actions or processes that will produce a given outcome. It is here that standardization, clinical practice guidelines, and protocols for well-understood, common surgical procedures or chemotherapy are useful. Two examples are the steps to take when a patient's heart stops beating or when performing an uncomplicated gallbladder surgery. These are not situations that people want to discuss endlessly or for which there are a lot of different solutions. The goal is to make sure that the activity is done the right way every time.

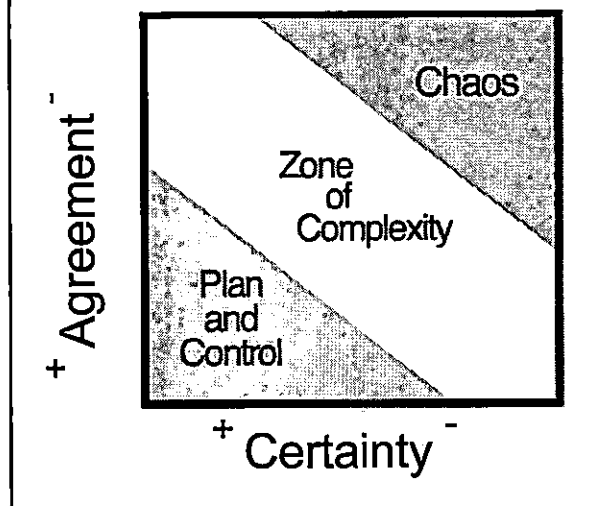
"Chaos" represents anarchy or disintegration, the situation in which most health care organizations found themselves when prospective payment was first implemented and there was a lack of agreement about what would happen and whether it should happen; there was no logical way of moving forward.

Most managers and clinicians tend to think that you have either "plan and control" or "chaos," suggesting a machine metaphor. In other words, if we just engineer what we should do in great detail and then make sure everybody does exactly the right thing, the right response will always take place.

Our committee members believe that the machine metaphor is unduly constricting and probably no longer useful as a way to think about quality of care. Stacey's illustration shows a very large area of health care that he calls the "Zone of Complexity." It is in this area where complex adaptive systems function. Unlike the area of plan-and-control with its standardization and where the same protocols are used accurately each time, the zone of complexity calls for adaptability. And we need flexibility. We need to be able to react to information and alter course. Complexity theory recognizes the need for judgment and for experience in devising solutions to new problems.

Many other service organizations understand this concept very well. For example, carrier crews on aircraft comprise some people with only a high school education who are able to deal with the complex, changing conditions

Figure 1.
Complex Adaptive Systems



that occur as planes leave and return to the aircraft deck. Somehow, the crew must prevent the planes, with the munitions and people they carry, from colliding and causing major damage. The crew is able to do this by producing what are called very high reliability organizations. Such organizations are not found just in manufacturing, as some people think, and we have a lot to learn from them.

Both the zone of complexity and the plan-and-control zone can be seen in the operation of an airplane. Pilots use checklists for takeoffs and landings. However, they also must respond to unusual situations on the basis of judgment and experience.

Just as there are errors in understanding the behavior that is needed in areas of complexity, so is there overuse and underuse in the application of knowledge. Errors occur in organizing health care, for example, when some items are overspecified and some are underspecified or understandardized. If activities are overspecified, the result is too many handoffs and unnecessary steps as well as an inability to customize for an individual patient's need. In such a situation, waste and error occur. In situations of underspecification, huge variations in practice take place that cannot be justified by patient need. Such situations represent lost opportunities for benefits to the patient.

The question is how to move from this concept to designing a health care system. The answer, I believe, is not to lay out a detailed blueprint for health professionals to follow in every instance. Instead, it is to recognize that complex adaptive systems are made up of parts that are active in ways that are not totally predictable. The challenge to improving quality is understanding that in those situations that lack high levels of certainty and agreement, adaptive variation is appropriate, whereas, when much agreement exists, you need better standardization.

For complex adaptive systems to move toward a goal, three attributes are necessary: a core purpose; internal motivation (for health professionals, it is to do good, to take care of our patients well, and to do it safely); and some simple rules to guide behavior. From these basic elements, we can have a good-enough vision and a good-enough direction for developing systems that can perform at a very high level.

A number of complex systems share these three elements and also have the range of diversity and creativity we would like to see in health care systems. One is the Internet, which was developed from some very simple transfer protocols that established how to move information from one place to another. The designers of the Internet could not lay out the way it would work in detail, partly because they were bound by their own inexperience with this emerging technology and partly because the end result was far too complex. Out of those simple protocols for transferring information has come something enormously diverse and much more creative than could have been envisioned.

Another example is VISA, the international credit card system. As developed by its founder, Dee Hock, the system is basically a for-profit membership corporation. Member banks are allowed to issue cards. All they have to agree

on is the graphic layout of the card (e.g., where the numbers and the magnetic stripe go). A common clearinghouse allows the card to be used anywhere in the world. VISA members are otherwise free to compete in all aspects of their business. The result is huge worldwide growth despite differences in customs, currencies, and banking systems throughout the world. We can now use a VISA card in an ATM virtually anywhere.

We see another example at the biological level. The four simple bases that make up DNA are paired according to some very simple rules and then clumped together into strands that form chromosomes. These very simple building blocks give rise to the huge diversity that is the property of complex adaptive systems.

Finally, we have two examples from familiar social institutions in which simple rules give rise to complexity. One is the Ten Commandments. Another is the Bill of Rights. (There are only ten rules in the original Bill of Rights, but they have given rise to a lot of diversity in behavior.) Both proclamations have been extremely robust because they are simple and thereby allow this great diversity to occur.

THE CORE PURPOSE OF HEALTH CARE

We also suggest that five aims make up the core purpose of health care: safety, effectiveness, patient-centeredness, timeliness, and efficiency.

Safety, of course, refers to freedom from accidental injury. To improve patient safety, health care organizations and professionals must establish and improve systems that minimize the likelihood of error, make those errors visible when they occur, and prevent or mitigate harm from errors that reach the bedside.

Effectiveness refers to systematically acquired evidence as opposed to uninformed habit or belief, and the use of such evidence as a basis for choosing an intervention to achieve better outcomes for patients.

Patient-centeredness refers to health care that respects and honors a patient's individual needs, wants, and preferences and also assures that the patient's values guide all decisions.

Timeliness refers to the flow of care, free of undesired waits and delays between those who give care and those who receive care.

Efficiency refers to the continual reduction of waste in health care, especially waste stemming from error and overuse of ineffective tests, medications, procedures, technologies, and other interventions. It includes not wasting resources that do not help meet patient needs—for example, supplies, time, forms, measurements, reports, motion, duplicated efforts, ideas not used, and information lost.

TODAY'S RULES AND RULES FOR THE TWENTY-FIRST CENTURY

Using the core purpose we have formulated as the basis for what we would like to strive for in a health care system, the committee began to think about

what simple rules might guide behavior to achieve these aims. I refer to these new rules as "twenty-first century rules" in contrast to "today's rules," or what I call "current rules." The current rules are not intended to be pejorative; everybody should recognize them as the way things are done today. The new rules should guide behavior as we design new health systems.

These new rules are interrelated. To take any one alone could result in a caricature of what we are trying to do. We also recognize that, as in complex systems, some of the rules may seem to conflict with one another. In some cases, the conflict will remain. In other cases, there is an opportunity to explore whether education and better information can help resolve the conflict.

1. According to the current rule, the health care system is configured 8 a.m. to 5 p.m. weekdays, with backup systems for weekends, holidays, and after hours. Often, a different standard of care pertains to the nonstandard hours. The new rule would be 24/7/365. The kinds of information, services, and interactions that people need should be available at any hour on any day. The need for health care is continuous.

2. The current rule is to provide care based on visits. The new rule would provide care based on healing relationships.

This recognizes that the first new rule, 24/7/365, is not achievable given the way our health system and our tools are currently configured. In many cases, the patient may not need to visit the doctor's office to receive care. However, the current payment system is designed for the patient to pay for visits and not for other forms of care. The new rule asserts that the product of health care is not the visit, but the healing relationship. As Don Berwick has said, "Interaction is the care; it is not a toll on care."

3. The current rule holds that professional autonomy drives variability. The new rule would hold that patient values drive variability. The current rule states that professionals should be free to use their judgment and their experience to determine the best source of care. This sounds reasonable. Variations in approaches appropriately reflect different local and individual styles of practice and training. The twenty-first century rule, however, states that variations in treatment should reflect modifications in care based on differing patient needs and preferences. The old rule is based on a commitment to autonomy as a fundamental health care value. The new rule is based on a commitment to excellence, standardization, and the best method known.

4. The current rule is that the professionals control health care. The new rule would hold that the patient is the source of control. This concept engendered much discussion in our committee. What do we mean when we say the patient is the source of control? Does it mean that doctors are going to be turned into simple prescription writers? What happens if patients demand something inappropriate? Should we give it to them?

Basically, the new rule derives from the way the current system operates: Control over decisions and resources and access and information is in the hands of the caregiver and ceded to a patient only when the caregiver chooses

to do so. The corresponding new rule says that, except in unusual circumstances, patients should control the timing of their care and the type and location of this care, and they should have the information they need to make such decisions. Clinicians should “take over” only when a patient cedes this privilege.

5. According to the current rule, information is a “record.” It is archival, retrospective, and an artifact of a visit. It is possibly used for litigation or other reasons. But it is not part of the care process. In the new rule, information is the key to the human relationship. It is interactive. It is not inert (as it is when it is stored as a record). Instead, it is real time. It is prospective. It is the essence of the care itself. Patients want information, and the transfer of knowledge is part of fulfilling the goal of care. Putting a block or a bottleneck in the process (e.g., by making the patient call for an appointment or for permission) fails to meet this patient need. It also puts the 24/7/365 approach even further out of reach.

6. Basing decision making on experience is a current rule. The new rule is to base decision making on systematically acquired knowledge. Closely related to the aim of effectiveness, this is also a knowledge-based rule. The current rule can be stated as “the best care for individuals is based on the experience of well-trained professionals.” The new rule might be stated as “the best care is the conscientious and explicit and judicious use of the current best evidence in making decisions about the care of individual patients.”

7. The current rule views “do no harm” as an individual responsibility. It holds that competent, well-trained professionals do not make mistakes (one aspect of the “do no harm” concept). The new rule treats “do no harm” as a system capability. It recognizes that very good systems of care are needed both to prevent and detect errors and also to mitigate them when they do occur. Errors occur for many reasons, including faulty equipment, system design, fatigue, limited memory, and distraction. Improving safety calls for learning about error and using this knowledge to design systems of care that prevent error when possible and always minimize the harm from errors.

Patient safety is not a program or a plan. It emerges from safe designs and safety systems and incorporates an understanding of human factors. It requires dramatic leadership from governing boards, corporate executives, and the leaders of clinical groups embedded in larger organizations. Creating safety systems requires that clinical leaders and managers use the best available knowledge about safe design for tasks, equipment, rules, and environment. Clearly, it involves a change in the culture of medicine and health care to emphasize safety.

8. The current rule is that secrecy is necessary. The new rule states that transparency is necessary or, put it another way, that there should be no secrets.

The current health care system places a premium on secrecy so as to maintain the trust needed for healing relationships and shares information with patients and the public only if the information is not likely to confuse, frighten, anger, or hurt anyone. In the new health care system, there would

be no secrets; patients would have unfettered access to information that is related to them, whether it is their medical record, diagnostic tests, or reports. Clearly, one can always think of an extreme case where this would be a problem. However, our committee believes that increasing the trust of the American public in health care institutions requires transparency.

9. The current rule is to react to need. It is the way in which health care is now designed and delivered. The twenty-first century rule would be to anticipate health need, based on knowledge of the patient, local conditions, and the natural history of illness.

10. The current rule is to seek improved value through cost reduction, which is related to the notion of seeking improved value through the elimination of fraud and abuse. The new rule rephrases the current rule, namely, seek improved value and decrease cost through innovations in safety, effectiveness, patient-centeredness, timeliness, and efficiency (the five aims stated earlier).

This rule does require innovation; it is not a matter of simply ratcheting down and reducing the resources that are available for care. It recognizes that improved quality care and system performance are not going to come from stressing the system further by asking people to work harder or faster or longer (and, by the way, not to make any errors). Improvement must come from specifically and systematically developed innovative strategies that focus on the aims of the health care system.

11. The current rule is that professional roles trump collaborative work. The new rule would hold that collaborative work trumps professional roles. The current rule focuses on role definition, certification, licensure, and doing one's own work and only one's own work. It is the basis of professional self-esteem and status, and it is usually a criterion of excellence. It also makes roles preeminent, rather than the need of a patient. Under the new rule, we would talk about skill sets as defining roles and assume more fluid roles.

12. The final current rule is that health care tends to be designed for both the usual and the unusual.

The current rule relates to training in the health professions, specifically, to design systems that treat all possibilities as equal and all probabilities as equal; to take into account all possible occurrences; and to then build a system to accommodate all of them. Wasteful, cumbersome, and inefficient, this approach is sometimes called "designing for the chief resident's case." You do not want to miss the one thing you really should have seen and addressed. The new rule is what is sometimes called the 80/20 rule: Design for the usual and plan for the unusual. Eighty percent of the work on any given day is predictable, so design for the mainstream or the majority of cases. Then have contingency plans to help you deal with the other 20 percent.

These rules are not meant to be inscribed in stone. Instead, they provide a sense of where the committee is going. It is at a different level of abstraction from the issues that emerged from the errors report, which were very concrete about very specific steps that could be taken.

3

REDUCING DRUG-RELATED MORBIDITY AND MORTALITY

J. Lyle Bootman, PhD

The pharmacy profession has been retooling itself for approximately the last fifty years, particularly as new technologies and new types of drugs are developed that eliminate the need to compound the drugs. The issue of quality control, however, has concerned us as far back as the 1800s and, since then, the Eli Lillys of the world have become so effective at manufacturing quality control that when you need 50 milligrams of x , you get 50 milligrams plus or minus 1 percent or less.

Today, we are beginning to look at how that drug is actually behaving in the patient. By viewing the situation from an outcome perspective, we can focus on how to prescribe the right drug in the right dose to achieve the expected clinical outcome successfully.

PHARMACY'S PERSPECTIVE ON HEALTH CARE

The pharmaceutical profession fills more than two billion prescriptions per year, or millions of prescriptions daily. The error rate for putting the wrong pill in the wrong bottle is almost certainly less than 5 percent. However, when they do occur, these errors pose not only a clinical problem but also a serious economic problem demanding the allocation and reallocation of resources.

At the University of Arizona, we train students in nursing, pharmacy, medicine, and public health, typically in classes without colleagues from other disciplines. Thus, we offer four classes in anatomy, four in biochemistry, four in pathophysiology, four in pharmacology, etc. But we do not have a single course where nursing, pharmacy, medical, and public health students come together to engage in a collective dialogue on their particular roles and functions in the area of patient safety.

Countries all over the world are looking to the United States for leadership in solving this problem. They recognize that if errors are occurring at Dana Farber, Ohio State, Arizona, and Mass General, errors are occurring in New Zealand, France, and many other countries as well. They are hoping that with our resources (the U.S. spends 15% of its gross domestic product on

health, while other nations spend far less—7–10%), we will provide the necessary recipe, the solution, and the guidance. Unfortunately, we are not spending a great deal on identifying or resolving the medical error issue.

TRENDS IN HEALTH CARE

The three determinants of value are access, cost, and quality. We cannot talk about any of the three components without talking about the other two. Obviously, resources are limited and, therefore, access will always be an issue. In terms of drug therapy, the debate as to whether to offer Medicare patients an outpatient drug benefit continues to be a hot topic. Thus, we must continue to emphasize the need to balance cost and quality. (Quality, in turn, has three variables: structural elements, process, and outcome.)

Our Aging Society

On January 1, 2011, when the first baby boomer turns 65, we will start moving from a population of about 40 million elderly to close to one of 80 million elderly. This development will challenge the health care system in terms of the number of people who will be taking medications, the number of chronic illnesses we will be seeing, and the different profile of illness we will see in the elderly compared to those we see today.

Increasing Corporatization

At the moment, however, probably the most striking impact on clinicians and practitioners in the world of health care is the corporatization of health care. Not too long ago, a good number of students in a school of pharmacy would say, “Yes, I want to own a community pharmacy.” In a similar vein, many a medical student would say, “I am going to hang a shingle out on East Grant and, voila! People will come.”

Today, most of our students see their future not as independent professionals but as employees of a corporation (for-profit or not-for-profit) in the business of providing health care. Furthermore, they see themselves as becoming increasingly beholden to shareholders, a board of directors, and, indeed, to a different type of mentality. The other dimension to this issue is that the major purchaser of health care is the Fortune 500 company as opposed to individual consumers.

The employers and the purchasers in the health care field that I meet are not ready to pay for the current expansion of health care. They are frightened by the 20-percent annual increase in the cost of pharmaceuticals. They see these costs continuing to climb as we move toward becoming a nation with increasing numbers of elderly people. And they believe the pharmaceutical industry has enough money to handle the problem.

The major increases in pharmaceutical prices are due to increased demand by consumers; increased utilization is more of the cause than the price per unit. Costs today are also driven by enhanced product development

(approximately 7,050 drug products are currently in the pipeline). The situation can explode even further. Some estimates foresee the number of prescriptions filled annually moving from between 2.2 to 2.6 billion prescriptions to more than 5 billion prescriptions in just four to five years.

Impact of Technology

The cost of prescriptions may hold even more severe economic consequences tomorrow as we start talking not about five cents a tablet, but about \$1,000 or maybe \$10,000 a dose, primarily as a result of the human genome project. Drug targets may rise from 500 to 5,000, and perhaps even to 10,000. If we become able to use drugs to cure diseases, the price of a drug treatment may rise to \$50,000. At that point, the consequences of not using technology appropriately will have even more serious ramifications than it has today.

Measuring Outcomes vs. Cost

In general, the health care profession is not accustomed to balancing outcomes against costs. Contrast this situation with what happens in industry. The president of General Motors, by going through his systems, knows within five seconds the impact that changing the alloy of a lug bolt will have on both sales and manufacturing costs. Yet, we change from drug *A* to drug *B*, and may take months or years to figure out the cost and clinical ramifications.

However, employers in the United States are becoming more sophisticated as buyers of health care and more understanding of their employees' problems. They are beginning to collect data on what health care costs them in terms of direct and indirect (i.e., productivity) costs. Also being discussed are how they can manage costs better, and how they can induce employees to take better care of the conditions requiring the attention of a health professional.

They are doing this not just because these conditions occur but because they want to identify the health care costs that have an impact on doing business. The CEOs of Fortune 500 companies are frustrated because they are paying for our mistakes and inappropriate judgments on the one hand and, on the other, competing with foreign companies (e.g., Toyota) who have a different means to provide health care benefits to their employees because they are not saddled with employee health benefits.

Much of the December 1999 Institute of Medicine report, *To Err is Human: Building a Safer Health System*, focuses on institutional care. Overall, we have a relatively better idea about what is happening in institutional care than in ambulatory care. However, the rate of error and inappropriate judgment in ambulatory care is remarkably high.*

We are now moving toward customizing therapy, that is, developing drug therapies from simple chemical moieties to much more complex moieties.

* I suspect that The Institute of Medicine avoided looking at this latter segment of the health care world because information in this area is rather limited.

The aims are to produce:

- Products that can be used at home safely and effectively.
- Products that are not only safe and effective but also cost-effective.
- Products that move health care beyond disease eradication to quality-of-life enhancement.

In the past, only one or two new drugs were issued a year, and a typical doctor could take care of 80 percent of the patient load with 25 to 30 drugs. Today, we are moving from 500 targets of investigation to more than 5,000; as we learn more about the genetic basis of disease, some estimates go as high as 10,000 targets. A key research question is not what and how many errors occur in the health field. Instead, it is how to come to grips with the issue of value. Do we actually achieve value with the pharmaceutical technologies?

Moving beyond the issues of safety and efficacy, do we know if we achieve optimal value with the correct use of pharmaceuticals? In other words, are we lowering blood pressure in a relatively cost-effective way? Do we know if drug *A* is more cost-effective than drug *B*? Does either one lower the length of stay in the hospital? Does one drug improve the condition of the disease at relatively low cost compared to its competitor?

Another point to keep in mind is the general theory that no matter how cost-effective or efficient a drug is at phase 1 or phase 2, its overall value is diminished once it enters the marketplace. Compliance with drug therapy in a clinical trial is basically 100 percent, contrary to our real-world experience. Noncompliance is not an issue during the clinical investigation phase, but in the real world it is a major issue that leads to the reduction in overall value. Rates of noncompliance vary radically based upon disease state (table 1). The range is from a low of 33 percent for antibiotic use to 34-94 percent for hypertension (Sullivan, Kreling, and Hazlet 1995).

Table 1.
Compliance with Medication Regimens
in the United States

Type of Treatment	Compliance Rate (%)
Treatment for hypertension after:	
• 1 year	94
• 2 years	65
• 3 years	34
Tuberculosis drugs	55
Tranquilizers in neurotic outpatients	54
Treatment for hypertension (in general)	53
Insulin injections for diabetics	48
Anti-asthmatic drugs	46
Glaucoma eye drops	42
Sleeping pills, sedatives	42
Tranquilizers in schizophrenic outpatients	42
Treatment with antibiotics	33

SOURCE: Sullivan 1990.

CLINICAL AND ECONOMIC IMPACT OF DRUG-RELATED PROBLEMS

A number of leaders in our profession are studying the related issue of drug-related problems, defined by Hepler and Strand (1990) as "any event or circumstance involving a patient's drug treatment that actually or potentially interferes with the achievement of an optimal outcome." People in the pharmaceutical profession tend to characterize drug-related problems as falling into eight categories, as follows:

1. Untreated indications
2. Improper drug selection
3. Subtherapeutic dosage
4. Failure to receive drugs

5. Overdosage
6. Adverse drug reactions
7. Drug interactions
8. Drug use without indication

In drug use without indication, for example, an error may occur when a doctor prescribes an antibiotic for a condition not needing an antibiotic. Today, we see resistance that has developed to antibiotic treatment as the result of the overuse of certain antibiotics. This has had both a clinical and economic impact. Of course, some areas are problematic. A patient who gets a drug or other chemical may run a high risk of developing some type of toxicity. This does not mean that we eliminate the drug; it means that we need to monitor and adjust dosage to prevent or minimize such a problem.

THE HUMAN AND ECONOMIC COST OF DRUG-RELATED PROBLEMS

An issue that concerns us in the pharmaceutical field is noncompliance, as stated earlier. An estimate from a company that manufactures a hyperlipidemic agent to lower cholesterol states that the average length of therapy is approximately sixty days. However, pharmacists and physicians know that you cannot get an appropriate clinical outcome with only sixty days of therapy (to which the patient probably will not adhere anyway). Numerous studies show that compliance is a major problem in the health care field. Do we call this an error? One of my colleagues estimates that the cost of noncompliance in our country is approximately \$35 billion (Johnson and Bootman 1995). Other estimates come in under or over that figure for 1995, depending on the direct and indirect costs calculated.

In 1995, my colleagues and I estimated that we spent more than \$76 billion annually to address drug-related problems (DRPs) in the United States in ambulatory settings, the equivalent to the amount used to purchase drugs in the United States (table 2). In other words, for every dollar we spent to purchase a drug, we spent another dollar to take care of the problems surrounding the use of that drug.

Table 2.
Drug-Related Morbidity and Mortality in U.S. Ambulatory Settings, by Number of Cases and Cost, 1995

Type of Admission	Number of Cases (millions)	Cost (in billion \$)
Hospital	8.8	47.4
Long-term care	3.2	14.4
Emergency room	17.1	5.3
Subtotal	29.1*	67.1
Physician visits	116.0	7.5
Additional prescriptions	76.3	1.9
Subtotal	192.3	9.4
Total	221.4	76.5

* Includes 198,800 deaths due to DRPs
Source: Johnson and Bootman 1995.

Of the 29.1 million cases of drug-related morbidity and mortality estimated by Johnson and Bootman, 198,800 are deaths, probably occurring in ambulatory, nursing home, and institutional settings. Our estimate is much higher compared to others, probably due in part to our taking noncompliance into account along with a broader definition of "drug-related problems."

The Bates study for Lucian Leape showed approximately 6.5 adverse institutional drug events (ADEs) per 100 admissions. Of these, 13 percent were life-threatening, costing approximately \$4,700, or about \$14 to \$15 per ADE.[†]

The difference between the Johnson and Bootman findings and work by Bates and colleagues is a result of setting. The former is an estimate in the ambulatory care setting and the latter an estimate in the institutional setting.

Together, drug-related problems occurring in ambulatory care, skilled nursing care, institutional care, and long-term settings can be estimated as about \$100 billion annually. Unfortunately, we spend very little on research to resolve this issue. I believe we spend about \$2 billion for cancer research, which has a total cost of disease to be about \$100 billion. I am confident we spend far less in researching and resolving drug-related problems.

The resources to address the alarmingly high incidence of drug-related problems need to be allocated. The Institute of Medicine report on medical error suggests that we spend at least \$100 million annually just to address the IOM definition of error,[‡] which is mainly a systems-centered definition. I suggest that even if we improve the systems and the items that the IOM addresses directly, many of the drug-related problems not necessarily addressed by the systems will continue to occur.

WORKING TOGETHER TO IMPROVE OUTCOMES

A major strategy for reform has to start now. It should start with asking our existing practitioners to do more to educate consumers about proper dosage, effective drug therapy and treatments, and cost-effective treatments. The pharmacy profession cannot do this alone. We have been working on various practice strategies for fifty years and have conducted a number of studies on this issue. What we need now are more studies on how to surmount this problem cost-effectively.

Before we plan for the future, however, we have to keep an eye on the real world. America's employers, who pay a good chunk of the health care bill, are serious about improving quality. They want to know that they are obtaining quality for the dollars they pay.

Although the health care professions have implemented strategies and improved particular situations, pharmacists are rarely engaged in this type of discussion. We are still operating in our own closet.

This represents a major attitudinal barrier. A key question now becomes who will influence the cost-effective application of drug therapy. One profession? A group of professions? Pharmaceutical care is the paradigm that the profession of pharmacy is promoting. As in medical care, it is the responsibility of the pharmacist to provide drug therapy to cure disease, reduce symptoms, reduce pain, prevent disease, and slow the progression of disease. The mission of pharmacy is to assume responsibility for the provision of pharmaceutical care, certainly in partnership with the other professions such as medicine and nursing. The profession of pharmacy has been

[†] The study also showed that having pharmacists participate in rounds and become more actively engaged in the therapeutic activities reduced the ADE by 66%.

[‡] IOM definition of error: The failure of a planned action to be completed as intended *or* the use of a wrong plan to achieve an aim.

restructuring its educational programs, enabling practitioners to insure cost-effective therapy.

We believe that the members of the pharmaceutical profession are at the last stage of an encounter with a patient. Patients often share information with us that they may not share with other providers, possibly because they are intimidated and almost certainly because of time constraints.

In essence, I would like to see academic health centers take the lead in experimenting with different models of practice and education, moving beyond just error to pursue the broader notion of achieving appropriate outcomes. Perhaps we can work toward utilizing the nurse, the nurse practitioner, the nutritionist, the physical therapist, the pharmacist, and the physician in an integrated approach. The ultimate goal would be to insure positive outcome (clinical and economic) in the diagnosis and treatment of disease.

Pharmaceutical care is not necessarily a pharmacy paradigm. It is a health care paradigm, one in which the pharmacist, physician, nurse, and patient work together to try, for example, to lower blood pressure in an informed way. Numerous studies show that when pharmaceutical care activities are implemented, outcomes improve. One of these studies focused on diabetic patients in Asheville, North Carolina, where estimates of days lost from work showed that absenteeism due to diabetes was costing the city a lot of money. A firefighter who could not work because his diabetes was not being managed properly cost the city in many ways since the mayor had to pay the firefighter sick leave and also replace him with another firefighter. In assessing these outcomes, the study found that, on average, 33 percent was the best that could be achieved in terms of controlling the clinical outcome for diabetic patients. With appropriate help from specially trained pharmacists, the rate went up to about 95 percent.

Working together will require serious reform in the way we educate our students. But it is not too complex a task. All physicians come from approximately 126 medical and osteopathic schools; pharmacists come from 82 or 83 pharmacy schools. We can put all the key players in one room and ask them to reexamine what we are doing, how we are doing it, how much it is costing, and why we continue in our noninterdisciplinary way.

CONCLUSION

Approximately one year ago, I visited a publishing firm to discuss the publication of a story on the subject of drug errors. While there, I learned that the company had just bought 120 new computers for about \$1,000 a computer—the annual cost of a typical drug today. The company then spent about \$200 per employee for an extensive, six-week training program on using the computers effectively. In a similar vein, giving patients \$1,000 worth of a given drug but spending very little time, if any, on educating

them with regard to the use of that product, often leads to misuse of resources and poor outcome. Managing and optimizing drug technology means that we can add value to the system, whether in terms of diagnosing disease or treating disease.

One final note: For a long time when I had spoken to consumers, other health professionals, and students about this problem, I would end my talk with a slide stating, "My major goal has always been to maximize the value of drug therapy." One day at the National Consumers League, an 85-year-old woman told me she didn't like the slide. "It is fine for you people in the health arena," she explained. "But what really is important to me is my quality of life. If you can attend to this as your ultimate goal, I would feel a little more comfortable." Ever since, I have talked about our ultimate goal as achieving an enhanced quality of life. We, as health professionals, should take responsibility for reexamining our practice and educational methods. Our immediate goal should be to reduce medical error not only for the obvious clinical reasons but also to insure cost-effective care as well.

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4

EDUCATORS RESPOND AND REACT: PANEL OF NURSE, PHARMACIST, AND PHYSICIAN EDUCATORS

Janis P. Bellack, PhD, RN, FAAN
Doyle M. Cummings, PharmD
Vincent A. Fulginiti, MD

BELLACK:

The health education field today has a number of mechanisms for insuring competence and also for insuring continued competence. For example, we do a good job of role development, that is, helping students develop a professional identity as a physician or nurse or pharmacist or social worker. However, we have a poor record when it comes to preparing students for the broader competencies that cut across all of our disciplines. These competencies are essential not only to interprofessional collaboration but also to address some of the issues involved in improving health care quality and insuring patient safety.

Indeed, I think that the concepts of quality improvement and interprofessional collaboration can serve as the context within which students acquire the competencies specific and unique to their individual professions.

Redesigning the Curriculum

What does it take to motivate health educators to address the broader competencies, given the current academic health center environment with its diminished resources? I think it calls for a committed redesign of our curricula. Yet we still do not discuss most of the patient safety issues with our students. We do not build in structured learning experiences that relate to patient safety. We do not even take advantage of unplanned learning opportunities (e.g., building better patient-provider relationships) in the clinical environment that address the crosscutting competencies involved in improving quality and reducing error.

Emphasizing Accountability

The concept of accountability for care has moved along a continuum: In a report issued about two years ago, the Pew Health Professions Commission discussed five levels of accountability. To what extent do we help students achieve the five levels the commission cited?

1. *Accountability* for one's self. Our licensing boards and regulatory agencies certainly address our accountability as individual professionals. The system of blame or the culture of blame that exists in our institutions further reenforces self-accountability.
2. *Accountability* for one's team performance. We are now looking at getting measures of team outcomes rather than just individual provider outcomes, particularly in managed care organizations.
3. *Accountability* as employees. Most health professionals are moving toward working in large health systems, whether in a large group practice, a hospital system, or as employees of a health institution. In such cases, we bear accountability for the outcomes of the institution.
4. *Accountability* for what our individual professions contribute to health care, the improvement of health care, and the reduction of safety errors.
5. *Accountability* for the entire health care system. We must help our students understand this bigger picture. We have an obligation to watch each other, not in the sense of Big Brother looking over us but as a way to keep our eye constantly on the prize: quality patient care and desirable patient outcomes.

Emphasizing Collaboration

Another broad-based competency that we should be teaching is interprofessional teamwork and collaboration. To what extent are our curricula formally building in opportunities for our students to collaborate and work together in practice teams?

We have also heard a lot about the role of the patient and the public becoming better informed consumers. Yet, the idea of going out and partnering with patients and the public, and making sure they have the information they need to make informed decisions, is something new.

Another broad-based competency involves the entire arena of evidence-based care. This not only involves customizing care by using technology systems, but also building on research rather than relying only on independent clinical judgment.

At the Medical University of South Carolina, we adopted a set of core competencies three years ago. As a result, deans in our medicine, nursing, pharmacy, dental medicine, and thirteen allied health programs now not only have to show how they are doing something. They also must measure what they are doing and ensure that students graduate with these core competencies.

Overcoming Barriers

Our health care delivery organizations are going to have to address what a colleague has termed “the cost of caring.” If we can spend time with patients and validate that they do understand what is happening, we can reduce medical error; we can reduce drug-related morbidity and error. But it is going to cost us to put these mechanisms in place in the system.

The classic arguments (The curriculum is too crowded. We have to abide by our accreditation criteria mandates.) are legitimate. But, I also submit that we have an incredible amount of redundancy and waste in our health professions curricula.

We also have a culture of blame. If students come into the next rotation or course or level and say, “We have not heard that before,” we blame the colleagues who handed them off to us even if we have never talked to these colleagues at the earlier level. We do not ask each other, “Did the students really get this?” or, “Are we holding students accountable for what they have learned?”

Another barrier is our litigious society. In this regard, I cannot help but think about the tobacco industry. Is it this industry’s fault if somebody starts smoking after the warnings are posted? A jury just recently said “yes” to the tune of huge amounts of dollars. Thus, it is one thing to talk about shifting the culture of blame when, at the same time, there is still a risk of losing one’s license, being accused of malpractice, of losing one’s lifeblood. This is a critical issue, one for which I do not have an answer.

How can we help our students balance the resulting tensions? How do we partner the data we can now track with the quality improvement tools we can now use and with the clinical judgment we still need in novel and uncertain situations?

One way might be to look at whether the percentage of medical errors differs from novice to expert along a continuum. The answer has implications for the way we structure our systems of mentoring, educating residents, and orienting new graduates. Conventional wisdom says that the novice makes more errors. However, the novice might make fewer errors because he or she is more cognizant of not knowing as much as the expert. Of course, novices (especially in nursing with its severe workforce shortages) need much more direction today. New graduates are being thrown into situations where they have to assume responsibilities for which they are not prepared, creating very unsafe conditions.

I frequently hear employers say, “If they would just ask for help.” But because of the culture of blame that has developed over the years, the people who do ask for help are labeled as unprepared, incompetent, and not ready for practice. This truly means we have to change the system, perhaps by having seasoned practitioners mentor new graduates.

The Need for Leadership

Two questions that continually come up are, Who will pay for the changes, and how much do they cost? Vincent Fulginiti of Children’s Hospital, University of Colorado Health Sciences Center, has said, “If there is a will,

there is a way. What prevents us from doing X is not the limitation of funding but how we allocate funds we have."

How do we get our faculty and practice workforce up to speed so that they can model these new competencies and integrate them into curricula as they prepare our new graduates for future practice? The health care delivery system seems to be able to turn on a dime, but changing the education system is like turning the Queen Mary. It takes forever. Thus, I think we need to reengineer not only our curricula but also the systems by which we make change and test change. We need to look outward from our health professions education programs and consider the system for which we are preparing our graduates. Too often, we get stuck in the way things were always done. I suggest that if we had leaders with the courage to "put their money where their mouth is," we would see a swell of positive responses from faculty, students, and systems for a culture change.

We have committed ourselves to moving forward. However, we have a faculty workforce that is not prepared to do so; for the most part, they have not acquired the broader competencies or worked in a culture that has valued or rewarded these competencies.

The health professions disciplines share a solid common core. We need to build the capacity in our practice systems for a team environment and for communication. Health professions education programs must partner with delivery systems to create such environments, thereby supporting the learning that relates to the predominant issues in the practice arena. For example, our students need to become acquainted with the issue of medical error not only through what they read in the papers or see on the six o'clock news but in the classroom and in the clinical environment.

It is true that everything today is resource-tight. However, I see this as an opportunity to use our resources in different ways. We can have enthusiastic faculty. We can have "go-go" students. But we must also have leadership and commitment from the top. At our school, the students really have done quite a bit to drive interdisciplinary experiences on our campus. Once we got some of these courses up and running, there was not enough space for all the students who wanted to get into them. Our provost consequently invested some resources in doubling the space. Students can drive the demand, but you must have people at the top willing to make the necessary commitment.

Conclusion

We cannot afford to keep looking back and remembering what we now think of as "the good old days." We must be forward-looking and considering the opportunities that the changed environment affords us.

Let us also look at what's right with our system. In a response to the Institute of Medicine's report on medical error, Troy Brennan of Brigham and Women's Hospital points out the improved rates of survival and the decreased complications from a number of procedures we have seen over the years.* He says that what we have achieved in such a short time is remarkable. We are at a point where we are focusing on what is wrong with the system rather

than on also looking at what is right with it. It is also important not to lose sight of the good things that are going on.

Nevertheless, we must be willing to give up the role of being expert as faculty members and recognize that there are new competencies that we do not know and must educate ourselves about. The question now is, Are we willing to turn the curriculum on a dime?

CUMMINGS:

One of the most critical problems in patient care today is the underutilization of the pharmacist, a profession that can provide much of the expertise we need to inform solutions to the problem of patient safety and medical error. Of course, this does not imply that pharmacists hold the solution to the problem. Rather, it means that the pharmacy profession holds one key to an interprofessional solution of a complex problem.

The Many Faces of Collaboration

Below I pose five challenges to health professionals educators interested in fostering in their students the ability to collaborate professionally. All begin with "R."

1. The first "R" is Relationship development, or communication skills. We spend a great deal of time giving our students tremendous amounts of science. We develop in them the ability to go through lots of information quickly and come to important and rational decisions about what is appropriate for a given person's care. We also impart reasonably good skills for relating to patients.

However, we fall down when it comes to giving students the communications skills they need to relate to one another. I venture that few of us have specific, defined pieces of the curriculum that allow learners to learn the best way for communicating with other health care professionals about specific health problems. When students start practicing, will they be able to understand what their colleagues' education and scope of practice is like? Will they understand the medical group process? Will they understand conflict resolution and how to work as a team? Will they know how to negotiate the best possible plan of care for a given patient?

2. The next "R" is Role model. Again, we have done a reasonably good job of identifying role models who inculcate students with the values and abilities that will earn our stamp of approval as they prepare to walk out the door. However, we have few functional role models of teams who collaborate in a way that minimizes drug therapy problems.

One way to fill this gap is to help those preceptors who work day in and day out with students in their rotations become role models on how to minimize the consequences of drug-related problems with other health professionals.

* T. Brennan, The Institute of Medicine Report on medical errors: Could it do harm? *New England Journal of Medicine* 342 (April 13, 2000):1123-1125.

3. The third "R" relates to Responsibility. Pharmacists want to see themselves as the health professionals responsible for drug therapy outcomes. Yet historically, these outcomes, and the associated responsibility for them, has resided with the prescriber. Where does the responsibility actually belong? How do we diffuse the concept of responsibility across a broader group of people so that we understand that we are all collectively responsible for insuring the optimal outcome of a patient for whom we are providing care?
4. Research is the fourth "R." I believe there is little in the literature about effective models that push collaboration to the point of looking at real outcomes. Clearly, we need a great deal more pilot research on the best models of collaboration for minimizing adverse drug outcomes.
5. The last "R" is Redirection, or a broadened focus. Not having people on drugs that are going to cause problems is certainly the best and cheapest way to deal with drug-related problems.

A Community Approach

I believe that the diet of Americans is worsening. We are eating much more processed food today. The body mass index is going up, and physical activity is going down. The coming generations will probably continue to have tremendous problems in terms of the development of chronic disease. If we are to minimize serious drug-related consequences, we must do a better job of preventing the development of the conditions for which we take drugs in the first place.

Preventive health care goes much beyond the health care sector. In the long run, health care comes down to local issues. One way to promote preventive care is for university health systems and major employers in a given area to get together to understand the dynamics involved in caring for the local population, and then work together to achieve good health outcomes. In essence, we need a communitywide perspective that brings all the stakeholders together so they can agree on the best ways to heighten the well-being of their relatives, employees, and neighbors.

FULGINITI:

In this panel discussion, I look at some of the problems involved in dealing with medical errors and then suggest some potential educational approaches to reducing error. To do this, I take the tack of my own personal and professional life.

One of the issues that the Institute of Medicine study, *To Err is Human: Building a Safer Health System*, released in December 1999, attempted to approach is the definition of error. Where do we draw the line on what is and what is not an error, and how do we educate our students based on those definitions?

Defining Error

A few years ago, my wife hurt her shoulder playing tennis.

Her internist prescribed physical therapy and pain relief. Over the course of a year, she kept asking, largely through my prodding, for an MRI of her shoulder. The physician said it was not indicated. A year later, she was diagnosed with a rotator cuff tear; fortunately, it was repaired, and she is now back playing tennis.

Did an error take place in her treatment? We think it did. We discussed the situation with the physician very frankly. He replied that in his judgment, she had muscular and tendon problems, and he did not think he made an error.

When I was a student, we never discussed issues about error. In fact, we were told that we had to be perfect, that one did not make mistakes. By and large, students today are not educated to discuss medical errors either. At the University of Colorado, however, we have found our junior students in pediatrics, medicine, and surgery indicating that they appreciate the problem of medical error and are looking at intriguing ways to correct it.

I made one of my most significant errors when I was a resident and overdosed an adult woman with digitalis. The nurse brought it to my attention. Rather than ranting and raving, I went to a resident and the attending physician, and together we figured out how to handle the situation. As a result of that experience, I have never made another error in digitalis-dosing.

The Libby Zion incident in New York exposed the issue of resident fatigue 36 hours on, 12 hours off, 36 hours on. During my internship, we worked every other night because it was deemed part of the process of growing up as a physician. We now know that such working hours lead to fatigue and misguided, cloudy judgment. Yet, we still have problems addressing this situation because some residency review committees have not adapted to some of the changes that have been suggested to relieve resident fatigue.

When a nurse in one of our better hospitals overdosed a patient with KCl, causing the patient's death, the story played in the papers. In Denver, physicians confront a newspaper story about a medical error virtually every week. The most recent story concerned an anesthesiologist who was penalized for having made a grievous error that resulted in the death of a child. It was in the paper every day.[†]

What can today's practitioners be thinking of all the discussions on medical error and patient safety? First, they are probably afraid that the finger may be pointed at them and will be very suspicious when The Institute of Medicine and others say we are moving into a nonblaming atmosphere. Physicians want to know how they can be guaranteed that their error is not going to be on the front pages of the *Denver Post* or the *Rocky Mountain News* tomorrow, and how to guarantee that they are not going to be sued.

[†] In this context, it is interesting to note that Fox News recently carried a full half-hour story on "doctor errors," reporting a 49% error rate in hospital orders in hospitals. They were right, but 24% of the errors were in administration and 18% were for wrongly dispensed drugs.

Another human characteristic is to hold on to the notion that if you live in a glass house, you do not throw stones. If I criticize someone or point out an error in someone else, the same thing is going to happen to me. Sometimes at my institution we literally have to plead with someone to lodge a complaint so that we can take effective action.

There is also the too-much-work, too-little-time syndrome. They ask, "I have seven minutes for every patient in my managed care operation. Where do I find the time to learn about the nine hundred new drugs that are being introduced along with new techniques and diagnoses and treatments? How do I keep up?"

"Furthermore, what is an error anyway? Is my judgment going to be taken to task every time I make a judgment that turns out to have a wrong outcome?"

Health professionals are very concerned about what will happen. Almost all the health professionals I know want to do the right thing by their patients. For most, making an error is not a malicious kind of activity. It is part of being human and part of being in a business where there is so much uncertainty. We must take into account this "wanting to do the right thing" attitude as we try to correct medical errors.

Responsibilities of Top-Level Management

As a department head, I feel very strongly that my staff wants to accept the responsibility for dealing with these issues. However they do not want to be invidiously compared to other disciplines or to be held to the same measure.

Departments face interdisciplinary tensions and, unfortunately, disciplines can fire at each other. Error has the potential for being used as a way to downgrade someone you are dealing with on some other political issue.

When I was head of the Department of Pediatrics at the University of Arizona, we had consistent errors in the dosing of children, principally with digitalis, Genomycin, and other drugs absolutely dependent on both physiologic changes and age. We hired a pharmacist to be on call constantly. He not only monitored these orders, but also taught the health care professionals before any incident occurred, and, when an incident did occur, he was able to educate us afterwards. The error rate dropped amazingly.

Deans, unfortunately, are distant from clinical care, and some of the issues also tend to be somewhat distant from them. They have great responsibility at the administrative level. They deal with what I call futile empires, very powerful individuals who control part of their institution, and they also have a lot of crisis situations sitting on their desk. Their school, for example, might be in desperate financial trouble.

In addition, deans have to worry about the public posture. What is the public going to think of our institution if tomorrow's newspaper carries a story about the university hospital having all these errors?" We already see comparisons published on morbidity and mortality rates for diseases at

various hospitals (without necessarily ascribing error) and the costs for each hospital activity. In our community, these statistics are public knowledge.

Apart from the negative publicity and the invidious comparisons with other institutions, I also worry about where my institution stands in a very competitive environment. We have been struggling to protect our bottom line. Is this bottom line going to be affected if a newspaper story appears on medical errors at our hospital?

Such concerns often interfere with the kind of institutional decisions that have to be made about reducing medical error. School heads are asking what they can do concretely to make a difference.

I believe that at the chancellor and vice president level, high moral and ethical leadership is needed. Most of the people working at this level will accept this role and attempt to model for the deans and the faculty. They must do this if they are going to make any kind of change that affects patient safety.

They also need to talk about and act on interdisciplinary education. Such an educational undertaking will normally not come from discipline-oriented schools, deans, and faculty.

We must accept the inevitability of errors and the fact that we can no longer hide them under a bushel basket by maintaining that this is an internal matter. The health professional schools must start to deal with this topic, and, indeed, many have already started. Like the airline industry to which we have so often been compared recently, we must train for the unexpected, to look for error. We do not do this now.

Training for Error

One way to train for error would be to have an error committed when using standardized patients, see if the students recognize the error, and note how they deal with it once it is discovered. This is a model we can use educationally. Instead, we focus on diagnosis and history and the physical.

Second, we desperately need to train interdisciplinarily. *Catalysts in Interdisciplinary Education*[‡] deals with some of the issues that arise, detailing experiences on how to bring an interdisciplinary approach to training and how to overcome some of the obstacles put in our way.

One of the lessons of our Colorado interdisciplinary program in ethics is that many students come with only a vague idea of what people in other professions do. They have told us that they had not really understood what a physical therapist did and what all of these levels of nursing were about, and that they had never heard the term "PharmD." This year, therefore, we published a brief, concise curriculum in which the students discuss each other's curricula. I think if we can do such things, we are going to get better cooperation and collegiality among the health professions.

[‡] D.E. Holmes and M. Osterweis, *Catalysts in Interdisciplinary Education: Innovation by Academic Health Centers* (Washington: Association of Academic Health Centers, 1999).

We also have to deal with reeducation in both our formal educational system and our continuing education system. We now need to establish a monitoring system that identifies errors in as nonthreatening a way as possible.

One model is the physician impairment system at my hospital. Under this system, a physician impaired for any reason (e.g., drugs or depression) is referred to a group that deals with the diagnosis of that disability and prescribes a system of care that the physician must undertake before returning to work.

Finally, we must put in place a system of benign enforcement, namely, identify the errors and try to rehabilitate the people responsible for them. Unfortunately, if the errors are found to be repetitive and irreconcilable, those responsible will be penalized accordingly. Clinical privileges will be dropped. People will be fired. It is to be hoped that such actions can be kept to an absolute minimum, and then only for the most egregious kinds of behavior.

I do not think that we can completely assure everyone that this is going to be a totally benign system. On the other hand, we must assure the public that we are going to take action when significant events occur.

In closing, I want to describe something that our junior students did. The students had been told that when they make rounds, they have to sign out to the next person, that is, one student reads his or her note card to another student, who then writes down what the first student is saying on another note card.

The students said that it did not make sense. So they went out and negotiated a great reduction in Palm Pilots. They bought \$300 worth of software (for tracking patients and drug information, etc.) for \$80 and put these data on their Palms. Now when they sign out, they go through each patient, point their Palm Pilots at each other, and transfer all the information, sometimes in graphic form if they are dealing with blood pressure or some other phenomenon that can be measured that way. Furthermore, no handwriting is involved. They disdained what the faculty and residents told them.

I think this new generation of students is going to revolutionize the way we get accurate information.

5

FEDERAL AGENCY RESPONSES TO THE CHALLENGES OF QUALITY AND SAFETY

Howard Holland

We in the United States have much to be thankful for in terms of the quality of our health care system. It is the best in the world, one in which many academic health centers play key roles by pioneering advances in new technologies, conducting cutting-edge research, and providing care to many of the people in our society who otherwise would not receive this care.

PUBLIC ATTENTION TO MEDICAL ERROR

However, the Institute of Medicine (IOM) report released in December 1999, *To Err is Human: Building a Safer Health System*, raises a number of issues that give us all pause for consideration. The top-line results are well-known, namely, that 44,000 to 98,000 Americans die each year as a result of the health care services they receive, making preventable medical errors the eighth leading cause of death in the United States—more than breast cancer, more than automobile accidents, more than AIDS.

The IOM report received tremendous media coverage and has been key to a number of the tasks we have undertaken in the public affairs department at the Agency for Healthcare Research and Quality (AHRQ). Between March and June 2000 alone, more than 700 radio and television stations ran stories on the issues covered by IOM. Approximately one hundred of these stories were national stories on NPR, PBS, CNN, and ABC. Daily and weekly newspapers across the country covered this issue extensively, and it was reported as well in detailed articles in many health care trade publications.

The conclusion of the IOM report is that the majority of the problems leading to drug-related deaths in particular are systems problems rather than problems associated with the work of individual practitioners or other health care professionals. IOM cited the results of two seminal studies in this area. The Harvard Medical Practice Study found that 2 percent of hospital patients suffer preventable adverse events during the course of their stay. Of these, drug complications are the most common, accounting for approximately 19 percent of these events. Wound infections are the second most common, at approximately 14 percent.

Regarding wound infections, the 1994 Colorado-Utah Study found that 1.5 percent of hospitalizations were associated with preventable adverse events in those states. Furthermore, 66 percent were surgery-related. Half of all surgery-related errors were deemed to have been preventable, with surgical adverse events accounting for 12 percent of all hospital deaths in Colorado and Utah during the study period.

A recent Kaiser Family Foundation survey found that respondents were aware of the issue of medical errors to an unprecedented degree; in fact, they could cite not only the IOM report but some of its key findings.

THE IOM RECOMMENDATIONS

IOM suggested the following four-tiered approach to improving patient safety with the goal of reducing medical errors by 50 percent over the next five years.

1. We need to build leadership dedicated to reducing medical errors, improving patient safety, and expanding the knowledge base about why medical errors occur and what we can do to prevent them.
2. We need to institute mechanisms that allow us to better identify the kinds of medical errors that are taking place, learn from those errors, and put in place new mechanisms so that they will not be repeated.
3. We need to set standards for performance and expectations for safety.
4. We need safe practices at the delivery level, that is, within our health care organizations.

THE PRESIDENT'S RESPONSE

In reaction to all of these concerns, President Clinton issued an Executive Order on December 7, 1999,* charging the Quality Interagency Coordination Task Force (QUIC) with thoroughly examining the findings in the IOM report, bringing forth recommendations on the kinds of activities that Federal health care programs could undertake in the cause of patient safety, and suggesting other ways in which our health care system could be improved and the quality of care raised.

Since its inception in 1998, the QUIC has worked to ensure that many different groups having an impact on Federal health care all pull in the same direction to improve quality of care. Secretary of Health and Human Services Donna Shalala is the co-chair of the QUIC, together with Secretary of Labor Alexis Herman.† John Eisenberg, the administrator of AHRQ is the operating chairperson. We at AHRQ play a major role in serving the QUIC.

*The task force was established after a report from the President's Advisory Commission on Consumer Protection and Quality in the Health Care Industry.

† QUIC's response to the IOM recommendations, *Doing What Counts for Patient Safety*, was made public on February 22, 1999. It is available from the Quality Interagency Coordination Task Force Web site (www.Quic.gov) and the AHRQ Web site (www.ahrq.gov). The latter also carries a variety of information on medical errors under the banner, "Research on Medical Errors."

CONGRESSIONAL APPROPRIATIONS

Meanwhile, the House of Representatives has earmarked \$20 million for AHRQ's patient safety activities in the FY 2001 appropriations bill. A somewhat larger sum, \$50 million, has been set aside in the Senate, largely through the efforts of Senator Arlen Specter (R-Pa.) and Senator Bill Frist (R-Tenn.). Generally speaking, it seems that the Senate has paid a bit more attention to issues of medical error and patient safety, and the House has paid more attention during the current congressional session to issues related to ensuring patients' rights.

Nevertheless, through the efforts of Senators Specter and Frist, the Senate bill includes \$21 million above both what the President recommended and what is included in the House bill to fund these activities at AHRQ.

THE RESPONSE AT AHRQ

At AHRQ, we are responding to each of the four recommendations in a number of ways. The following discussion outlines some of the key activities that are either planned or underway.

1. Building Leadership

In response to the first IOM recommendation, AHRQ will establish a Center for Quality Improvement and Patient Safety that builds on our existing Center for Quality Measurement Improvement. Through the new center, we intend to fund research on medical error and patient safety more broadly, principally through extramural grants and contracts. We also will take steps to help translate research findings into improved practices; help educate patients, consumers, and health care providers better about safety issues; coordinate collaboration between the public and private sectors; and issue a national report on health care quality.

To help provide further leadership in this area of patient safety, AHRQ will convene a national summit on patient safety, tentatively set for September 2000. At this conference, participants will look specifically at what research needs to be done to help us understand more about why errors occur and what to do about them.

Two other national summits will take place within the next twelve months. The Food and Drug Administration (FDA) will hold a national meeting addressing drug and device safety issues. The Department of Veterans Affairs (VA) will hold a summit to address patient safety practices.

Other leadership activities are taking place at the Federal level. The VA and the Department of Defense (DOD) are taking steps to lead their provider organizations to take action specifically in the area of the development and dissemination of safe medical practices. The Health Care Financing Administration (HCFA) and the Office of Personnel Management (OPM) intend to use their power as health care purchasers to set better standards for safe practices.

2. Balancing Reporting Issues

The issue of reporting of errors raised in the IOM report has received the most attention. In some sense, this is unfortunate because the other three areas discussed may be equally rich, if not richer, for actually improving patient safety throughout the country.

In terms of the Federal government's response, AHRQ has attempted to strike a careful balance between what seem to be competing needs. On the one hand, we need to hold the health care system accountable for providing high-quality care. On the other hand, we need to establish complementary systems for collecting information that helps drive the agenda for improvement.

These complementary systems, whether mandatory or voluntary, should be built on a key principle—namely, the need for peer review protections for anyone involved in these reporting activities. These protections would ensure that the information collected is confidential and that the privacy of those people involved in reporting the information is protected. There would be no identification of patients or health care professionals; instead information would be collected, de-identified, aggregated at an institutional level and reported or in that fashion.

The goal is to establish public accountability through a mandatory system complemented by a voluntary system that would focus on adverse events and close calls. Both systems would be built around existing systems at the Federal and state levels and incorporate others, such as the various accrediting bodies, at the private level.

The National Quality Forum is the private-sector group that the President, by Executive Order, charged be created at the same time as QUIC. It was put into place by Vice President Gore in 1998. A planning committee then spent the better part of a year deciding what the National Quality Forum would do. Kenneth Kizer, the former Undersecretary of Health at the VA, is now its executive director.

We have asked the National Quality Forum to be directly involved with AHRQ in pushing forward an agenda in three of our ongoing activities:

1. Defining measures that should be part of both mandatory and voluntary reporting systems.
2. Defining specifically the egregious errors that the IOM referred to as "never" events that, as the phrase implies, should never occur.
3. Identifying specific patient practices that have been shown to improve safety, such as the use of computerized medical records and other kinds of technologies.

3. Setting Performance Standards

The Federal government has instituted a wide range of activities in response to the third IOM major recommendation. Beginning this year, the HCFA will require that all 6,000-plus hospitals and other health care organizations receiving Medicare funds have ongoing, meaningful patient safety programs in place. In addition, the OPM will require that the directories of health plans taking part in the Federal Employee Health Benefits (FEHB) program

detail their patient safety practices as part of how they do business. Roughly 300 or so plans would have to meet this requirement if they want to take part in the FEHB program during calendar year 2001.

In addition, the QUIC agencies are attempting to strike up partnerships with other professional organizations and associations, hospital initiatives, certification boards, and state licensure boards to implement patient safety practices. We believe that a partnership between all organizations involved in health care is crucial if we are truly to make a difference in this area.

The Food and Drug Administration will be taking a number of steps to increase the pre- and postmarketing surveillance of the products it regulates. To pursue these activities, FDA has received an additional \$33 million in its appropriation for FY 2001, or roughly a 65 percent increase over the amount received for such activities in the present fiscal year.

4. Investing in Safety Systems

For the fourth area in which IOM recommended action, the VA, which treats more than 4 million patients nationwide, will invest approximately \$46.6 million over the next year to enhance patient-safety training for all health professionals and other health care workers in its medical systems.

VA will also continue to implement its computerized order-entry programs, allocating \$75 million for this task over the next year. The Department of Defense will be following the VA's lead, also implementing various kinds of electronic medical record and patient safety systems and earmarking \$64 million during the coming year for expanding its current activities in this area.

The Indian Health Service (IHS) will be looking at ways to implement more computerized or high-technology systems in all its programs providing care to the tribal nations.

The FDA, which does a great deal of work in the area of drug names, labeling, and packaging, will look at new standards that might prevent the kinds of dosing errors that sometimes occur. (One way might be to highlight the potential interactions between various drugs on drug packaging.) The FDA is also about to implement the second phase of the Medical Product Surveillance Network (MEPSUN).

The Centers for Disease Control and Prevention (CDC) is committed to examining ways for expanding the nosocomial infection surveillance system beyond hospital infections to include other kinds of patient safety activities. Finally, the Medicare program will be looking at ways in which Medicare drug benefits can be structured so that they have an impact on reducing medication errors.

The states also have an extremely important role to play. The VA and DOD will work with some of the state associations through the National Conference of State Legislatures (NCSL) and other broad umbrella groups, sharing information about how state-run facilities can use some of the technological advances that the VA and DOD have been pioneering.

At AHRQ, we plan to continue to work with the states in evaluating current state reporting systems. We hope to find out what works best and how to improve those systems that currently have mandatory or voluntary reporting. We will then work with the states that do not have reporting systems and help them implement such systems within a three-year period if possible. We believe that CDC and AHRQ's Hospital Cost and Utilization Project can provide the states with appropriate models. We see a valuable role for the National Quality Forum as well.

The public (the constituency most directly affected by the problems of quality) also has a crucial role in all of this. We, therefore, plan to use many different kinds of models and activities to build public awareness about the health safety problem, as well as continue to educate purchasers and other health care providers on this issue.

Furthermore, we are evaluating the suggestion of a recent National Morbidity and Mortality Conference that we make the Web part of the process of gathering information about errors. Using a Web site, patients could report their experiences anonymously and confidentially, thereby continuing to build the base of knowledge about errors and why they occur.

THE ROLE OF ACADEMIC HEALTH CENTERS

We are eager for academic health centers to help us shape both the fundamental and applied research agendas, and become involved in the AHRQ National Research Summit.

We also could use help in building congressional support for the resources we need to conduct additional research. The more money we have, the more we can do. (We would like funding for health safety to be a little closer to what the Senate suggested than to what the House suggested.)

We also ask academic health centers to look at ways in which they can develop the capacity for building interdisciplinary research teams that tackle the problem of medical errors. Both Federal Government and IOM recommendations encompass issues that may not lie within the traditional health services research areas, such as ergonomics, human factors research, organizational development, and culture.

We think that academic health centers can play a crucial role by serving as models for applying new knowledge. One of the hallmarks of Senator Specter's proposed legislation is the need for demonstration projects on how to report errors and institute patient safety practices. The academic health center may well be the most logical place for such demonstration projects.

Finally, I suggest that academic health centers consider how they can enhance medical and health professions education in a way that will reduce errors and improve safety. Education will help the newer generation of health care professionals talk more freely about the kinds of problems they may run into, reinforce the need to work in a team-oriented fashion, and help shift our culture to one that brings issues of error and safety more into the open.

There is no magic bullet that will improve patient safety and reach all of the goals that the IOM outlined. Working together as partners, however, all players in the nation's health care system can make a difference in reducing errors and improving the safety of health care across the United States.

6

UME-21: A NEW CHAPTER IN HEALTH PROFESSIONS EDUCATION

Douglas L. Wood, DO, PhD

UME-21, or Undergraduate Medical Education for the 21st Century: A Demonstration of a Curriculum Innovation to Keep Pace With a Changing Health Care Environment, is a five-year, three-phase national demonstration project aimed at bringing curricula innovation into the clinical (i.e., the third and fourth) years of medical school. It is funded under Title VII at slightly more than \$7.6 million by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services. The project is a little more than half complete. Its seven-member executive committee comes primarily from the disciplines of internal medicine, pediatrics, family practice, and osteopathic family practice. The project also has a twenty-eight-member advisory committee and a parent, the Primary Care Organizations Consortium. It is administered by the American Association of Colleges of Osteopathic Medicine (AACOM), where I serve as president.

PROJECT REQUIREMENTS

Our request for proposal (RFP) inviting medical schools to join in the project brought a response from fifty-four applicants. The proposal asked applicants to demonstrate to us and to the medical education world how they were going to better prepare their graduates to practice in a rapidly changing health care environment. In the first iteration, the RFP focused a great deal on managed care. Subsequently, we removed the managed care emphasis because we believe that the managed care models of tomorrow will probably be dramatically different from those of today.

The final RFP specified that participation in the project would require each applicant to team with a partner. Not surprisingly, the final choices are all managed care partners, although some of the schools have other partners, too.

In their proposals, the applicants were asked to construct didactic and clinical learning objectives for nine knowledge areas based in great part on the work of Dr. Nicole Lurie, principal deputy assistant secretary for health at the Department of Health and Human Services. Schools that could not specify learning objectives were to explain why not.

The nine knowledge areas are as follows:

1. Health systems finance, economics, organization, and delivery.
2. Practice of evidence-based, epidemiologically sound medicine, with particular emphasis on a population-based perspective.
3. Patient and health care ethics.
4. Patient-provider relationships and communication skills.
5. Quality measurement and improvement, including cost-effectiveness and patient satisfaction.
6. Systems-based care.
7. Medical informatics.
8. Wellness, disease prevention, and health promotion.
9. Leadership and interdisciplinary teamwork.

It is interesting to note that many applicants did not understand the sixth knowledge area, “systems-based care. We had to explain that, fundamentally, health care in many areas is delivered in systems of care.

With regard to the third area, “Patient and health care ethics,” I believe that the ethical physician is one who is more likely to practice within quality standards. We need to teach our students to do more with less, in other words, to practice more efficiently and more effectively, but with fewer resources. The Golden Age of Medicine is over.

PROJECT EXAMPLES

Eighteen schools are now involved in the study. All projects are distinct and individualized even though they may share some common threads. Eight partner schools are doing all that they had proposed. Ten schools are associate partners, which were added after the initial selections because their proposals were excellent but did not quite meet our requirements. These associate partners are doing only part of what they proposed. A summary of projects at three of the schools follows.

Dartmouth Medical School

Dartmouth is a rural school, and most of its students go out into communities that are quite distant from the campus. As in most of the UME-21 projects, the school has strong input from its managed care partners; indeed, they are true partners.

Dartmouth has an “interdisciplinary, integrated primary care” program that cuts across medical student levels and communities. Under a system of preceptor-learner dyads, the student and the preceptor work very closely together. It is hoped that the student learns from the preceptor and the preceptor learns from the student.

How does a preceptor learn from students? At Dartmouth, for example, the students apply evidence-based medicine (EBM) concepts to a particular patient-care problem or issue within the practice in which they are working. They collect data. They analyze patient population data. Then they propose systems improvement within the practice.

One might wonder if these preceptors take to a study being conducted of their practice by students and then accept what the students have to say about practice improvement, including the whole area of patient safety. The answer is definitely, "Yes." In essence, both preceptor and student become learners.

University of Nebraska College of Medicine

Among the schools involved in UME-21, the College of Medicine at the University of Nebraska has probably the strongest input from its managed care partners. The school's project, $E=MC^2$, deals with managed care competencies. It is broad-based, intensely learner-focused, and combines both didactic and experiential learning methods. Its use of technology has been impressive. The rural population in Nebraska is geographically scattered, and the students must go into distant places for clinical rotation. The technologies bring the medical center to the student.

The curriculum consists of eight core elements. One component comprises four extensive, self-paced Web-based modules on managed care. The students must complete all modules; otherwise they do not graduate. Another component is a series of workshops; again, attendance is required. The most recent was "Challenges in Managed Care."

Jefferson Medical College

Jefferson Medical College in Philadelphia is taking part in the project as an associate partner. The college has strong input from the managed care entity at its institution.

Jefferson uses some of the modules from the *Physician's Study Guide of Managed Care* in its three primary care clerkships: family medicine, internal medicine, and pediatrics. Students are required to complete the modules, which have been integrated into a clinical environment in what is called a managed care mini-clerkship through which students rotate. The program is only one week long, yet it is rated very highly by the students and internal medicine residents enrolled in it, belying a common notion that the attitude of medical students to managed care is not good at all. Faculty members may not have a good attitude, but the students and internal medicine residents in the mini-clerkship do, and it has now been instituted as part of the internal medicine and residency program.

WHAT WE HAVE LEARNED

We will make a final assessment of what we have learned at the end of the project. The executive committee, however, believes some of the lessons learned to date will match much of what we will have learned when the project concludes.

1. Early in the project, we found that working with managed care partners can be difficult because of the regular changes in top-level executives.

Dartmouth and Nebraska have each seen significant changes in the administrative levels of their managed care partners and eventually had to switch managed care partners. Dartmouth started with four and now has only three partners because two partners merged. Jefferson has had five managed care partners.

2. Creating change in medical education is difficult without the support of high-level academic administrators. These administrators not only need to support the project; they must also become involved in the project. In those cases where administrators in the participating schools did not at least say, "This is a good thing to do, and we are involved in it," change was very slow or didn't take place at all.

3. Innovation in medical education is difficult without support from the dean. Although actual involvement in the change process is not absolutely necessary, the dean's support for the project is essential to its success. In one case where the dean was relatively silent on the project, it was difficult to move the project along.

4. Another observation, not surprising to those who work in medical schools, is that curricular change can meet with significant faculty resistance. I believe one reason is that faculty are very busy and may feel they do not have time to spend on yet another duty. Integrating programs like these in our project takes time and effort.

5. Curricular change might not be accepted by students—also no revelation. In Nebraska, there was what might be described as a minor student uprising among the first group of students. They said, "We didn't buy into this. Here is the description of the curriculum that we did buy into. And now you change it. How can this be?"

The lesson learned at Nebraska was that the students had not been made sufficiently aware of the rationale of the program. The school is now spending a great deal of time with the classes that follow, outlining why this program is important, and student acceptance is at a much higher level. Students simply need to understand why you are doing what you are doing.

6. A sixth issue is the difficulty, or perhaps impossibility, of standardizing a curriculum at all clinical sites because of the diversity of sites. At Nebraska and Dartmouth, students are spread all over the state. On the other hand, we have also learned that if the educational objectives and the evaluation system are well defined, this problem is reduced.

7. We have found that evaluating a project like UME-21 is difficult. To make evaluation less difficult, we have two sets of evaluators: a national program evaluator and evaluators at each of the eight partner sites. Evaluation remains difficult, but, in the end, I believe the evaluation results will be positive, useful, and generalizable.

WHAT COMES NEXT?

HRSA has challenged us to give some thought to mounting a new project. We have started discussing possibilities with Partnerships for Quality Education (PQE), whose work at the graduate medical-education level is similar to ours. We are looking into conducting a joint project covering both the undergraduate and graduate levels.

I believe that the next project needs to involve several types of health professionals and center on the clinical years of health professions education. There has been much experimentation and research on the first two years, but not very much on the last two years.

We need a project that emphasizes interprofessional cooperation, collaboration, and teamwork, one in which the various health professions actually demonstrate how teamwork is going to work. We should also emphasize community-based health professions education because here is where the action is. More than 90 percent of patients in the United States receive care in the community. Less than 10 percent are taken care of in academic health centers. I believe that the students should learn in the setting in which they are going to practice.

Finally, a new project might integrate some of the concepts of alternative and complementary health care, a suggestion that may be a bit controversial. Nevertheless, the data show that last year in this country, 41 percent of the population in the teenage years and above either used or sought alternative, complementary health care modalities

I think the public is telling us something. We need to listen to them.

7

HEALTH PROFESSIONS EDUCATION AND THE FEDERAL QUALITY INITIATIVE

Neil H. Sampson, MPH, MGA

The mission of the Health Resources and Services Administration (HRSA) at the Department of Health and Human Services (DHHS) is to improve the nation's health by assuring equitable access to comprehensive, quality health care for all. Indeed, we call ourselves "the access agency." The agency operates through five bureaus: the Bureau of Primary Health Care, the HIV/AIDS Bureau, the Bureau of Maternal and Child Health, the Office of Rural Health Policy, and the Bureau of Health Professions (BHPr).^{*} A number of these HRSA components, including the Bureau of Health Professions where I serve as deputy associate administrator, are now actively involved with the issue of patient safety.

THE GENESIS OF FEDERAL CONCERN

The Clinton Administration's discussions on ensuring patient safety go back a few years. The Advisory Commission on Consumer Protection and Quality in the Health Care Industry established in 1996, was one of the first large entities to use the word "quality" regularly. In 1998, at the recommendation of this advisory body, the President issued an Executive Order establishing the Quality Interagency Coordinating Committee (QUIC). QUIC's charge is to bring together the many Federal agencies that provide health care, and have them look at ways to improve patient safety under the leadership of the Department of Labor and DHHS.

With the publication of the Institute of Medicine (IOM) report on medical errors at the close of 1999, the President asked QUIC to establish a task force to evaluate the recommendations, identify prevalent threats to patient safety, and suggest ways to reduce medical errors throughout the nation's health care system. QUIC's task force included representatives from the Department of Defense (DOD), the Indian Health Service (IHS), the Bureau of Prisons, and HRSA (whose grant programs at community health centers and migrant health centers provide patient care), and the Department of Veterans Affairs.

^{*} The Web site www.hrsa.gov provides an overview of HRSA.

In its response, the task force reiterated the IOM recommendations and suggested some ways in which QUIC members can implement them.[†] (Pulling all the Federal agencies together to work on one concerted effort is a difficult task because, in fact, each department is like its own little Federal government.) HRSA signed on, agreeing that it would be appropriate for the agency to look at ways to reduce medical errors. Under the lead of the Agency for Healthcare Research and Quality (AHRQ), we are now participating in the Federal effort to improve quality care and reduce medical errors along with many of the other QUIC agencies. As we work with these other agencies, we can start seeing small shifts taking place that, over time, should make a difference. (I talk a bit more about medical error, in particular, and patient safety, in general.)

THE BHP_r MISSION

Under HRSA, the BHP_r mission is to provide national leadership in assuring that we have a health professions workforce that meets the health care needs of the public. We believe that the key to patient safety starts with us, in other words, with health professionals working together to make a difference. We also hold that if you are going to “do” quality, it has to be part of what you think you are.

Patient Safety

The BHP_r interest in patient safety focuses on finding ways to identify and learn from medical errors through reporting systems. Much of the discussion centers on clarifying the definition of such a reporting system, the distinction between mandatory and voluntary reporting systems, what we could learn from such systems, and how we could collect all the information we need.

At this point, we are not at all certain what a “reporting system” entails from the Federal government’s viewpoint. Some people have proposed that we involve existing programs, such as our practitioner data bank, in setting up a medical error reporting system. Although systems may contain information on medical error, we believe that they represent something wholly different from what we are seeking.

Another suggestion, and one that we are looking into, is to raise Federal standards and expectations for improvement that, in turn, can result in safe practices. We are also researching medical error frequency, along with the causes of medical errors and techniques to reduce them; how to collect relevant data; and how to improve safety practices.

Access

BHP_r also seeks 100 percent access to health care and zero percent disparities because we clearly have significant subpopulation disparities in health measures.

[†] Some HRSA staff provide a great deal of support for the QUIC initiatives. Additional information on QUIC appears in the paper by Howard Holland in this publication and on the QUIC Web site (www.Quic.gov).

Quality of Care

Another significant component of our strategic plan is quality care. This does not sell well on the Hill at times, but we keep putting it back in our budget. This past year, quality has been a difficult sell. Perhaps because of the IOM report, we are getting more support from budget and policy makers who are not in the field of health but are making judgments on health budgets.

Health Professions Distribution

At BHP, we hold ourselves responsible for the adequate distribution of health professionals in this country. We hear time and again of shortages or overages of physicians or nurses or pharmacists. At one time, the concern was over physical and occupational therapists. The truth is that systems balance and cycles occur; today we are probably back to a shortage in some areas of nursing. Why? Because the same issues that made it difficult to attract nurses to institutions about ten years ago have reoccurred.

Nonetheless, we have found that it is not always a matter of numbers. Sometimes it is a matter of distribution, that is, getting practitioners out to the areas and populations that need them. To accomplish this, you must select the right incentives. You must have the right system. You must have the right values.

Health Professions Diversity

We seek to improve the racial and ethnic diversity and cultural competence of the health professions workforce. Recent studies have discussed the need for cultural competency on the part of the practitioner. The racial and ethnic diversity of the health professions population today is not very good in terms of either what the working population looks like now or what it will look like in just a few more years. However, the distribution of health care professionals is less an equity issue and more an issue of access to a college education.

Licensing and Accreditation

The Bureau of Health Professions is seeking to develop and improve the health professions field in terms of different scopes of practice and licensure standards and continuing education. In other words, who has what right to provide what services? What are the issues involved in trying to protect the health industry versus protecting the public versus delivering services?

At BHP we have found that if the accreditors demand something, the institutions will start supporting it. However, improving the quality of practice and quality in education has been difficult to define. We are moving on it, but it still needs more work. In September 2000, the Council on Graduate Medical Education (COGME) and the National Advisory Council

on Nursing Educational Practice (NACNEP) are expected to hold another joint meeting on patient safety and medical errors. Participants will discuss safety issues and what their leadership role should be in this arena.[‡]

One of the projects recently completed by QUIC involved setting up the Federal Credentialing Program.[§] The basic idea was to make certain that (1) we have quality practitioners of all kinds in place who are making the best effort to provide quality care, and (2) we find ways to make life easier for practitioners.

At present, every time a practitioner moves from Department A to Department B in a Federal agency, or moves from one agency to another, he or she has to be recredentialed. If you move to work within a Federal system in a state, you have to get licensed in the state. You have to go back to your schools and collect all the papers. Then someone has to get all the papers and put them all together.

This is not an efficient procedure. Nor is it a useful management tool. You cannot tell how many practitioners you have because the information is not centralized. If you have to launch a national response to an emergency, you do not know where the emergency people are located. Everybody is worried about collecting paper, but no one is actually looking at what the paper means.

The VA, the largest single health system in the United States (perhaps 30 percent of the health workforce goes through this system at one time or another) speculated that perhaps we could identify a set of credentialing criteria that can be shared electronically. And, indeed, we have demonstrated that we can transfer these files electronically from one agency to another. Furthermore, we can do it in a fashion that is secure, that protects privacy, and that cannot be hacked into. This means that problems in quality can be picked up.

The system is already operational in the VA and, under the Federal Credentialing Program, we are now ready to move out to other government departments. This will permit these other departments to verify the credentials of all Federal health care practitioners in support of regular and multiple appointments, emergency medical response, and telemedicine. This improved, more responsive management tool has implications for use as a model outside of the Federal government.

Disseminating Information

Another role we see for ourselves at BHPr is not only collecting information but also asking the right questions and then trying to disseminate that information.

[‡] The Divisions of Medicine and Nursing have also proposed a meeting in Fiscal Year 2001 with medical and dental accrediting, licensing, and certifying bodies. The purpose is to determine what actions or new requirements they might add to current procedures for program accreditation or to board requirements for certification.

[§] The Bureau of Health Professionals' Web site (www.hrsa.gov/bhpr) carries information on the Federal Credentialing Project and the Division of Medicine and Division of Nursing.

BHP_r INITIATIVES

How we define what it is we do at the Bureau of Health Professions gets expressed through budget, and how we build our budget is not necessarily the way Congress appropriates money to us. (This kind of tension probably exists at state and local levels, too.) In the past, the budget approach was to list the line items (medicine, nursing, allied health, etc.) for which we needed money.

We now try to define the BHP_r budget in terms of initiatives. Under this approach, we list the key activities we believe should take place in the following fiscal year and then try to build a budget that goes to policy makers at several levels of the Federal government. The first level is at the Secretary's Office at HHS. A second level is at the executive level of the President, that is, the Office of Management and Budget. The third level is Congress.

We think our new approach focuses more clearly on what is needed, and should translate back to an outcome measure. However, it is not an easy way to sell policy makers who are used to the more traditional way of presenting budgets.

Long-term planning for us is next year. And really long-term planning covers three years. Thus, as we close out the current year, we are defending next year's budget and planning for the year after that.

Some aspects of health were taken out of our budget for several years. We have put them back in as discussed below.

Oral Health

Probably the biggest out-of-pocket expense in the budget is oral health. A report from the Surgeon General a few years ago identified oral health as a significant problem in the United States. Basically, the report held that if you are poor in America, you have oral health disease. Frankly, if we gave everybody access to oral health services, we would not have enough practitioners to handle the demand, but that is another kind of issue. Nevertheless, it is time we start putting the mouth back into our concept of health.

Border Health

We have been working on border health for a few years. The U.S.-Mexico border states—which to some degree include Florida—have major problems and environmental health problems galore in addition to physical health problems.

Kids in Health Careers

We have done a good job of drawing college students from diverse racial and ethnic groups into the health professions, especially medicine; many are going on to provide service to underserved populations. The problem is that few people from these population groups are in college.

We are therefore trying to launch a program among our grantees that will get more of these kids to go to college so that we can then get more diversity into the health professions. The idea is not only to start working with kids of all grades and linking them with counselors who will encourage them. We must also let them know where the opportunities lie and help them identify sources of funding. We have found that lack of such information is the major factor keeping minorities from going into the health care field.

Geriatrics

In our budget, we have brought geriatrics back into the picture, especially in terms of health practitioners in health systems. Actually, the geriatrics field has done a good job of providing interdisciplinary training and care for a subset of the geriatric population. However, this training and care is not available to most people.

Genetics

Physicians, nurses, genetic counselors, and the laboratories that do the testing are among those health care professionals just starting to deal with what will happen when the Human Genome Project ends. This is going to be a huge growth area, and we need to build it into our planning much more than we have done to date.

Medical Error

Under this budget item, we will be looking at the issue of medical error from two viewpoints, that is, not just in terms of patient safety but also in terms of redefining the workplace for the practitioner. If you have a healthy practitioner workforce, you also have a better quality of patient care. Sometimes we just focus on the patient; we forget that the workforce that actually deals with the patient also needs a safe environment. (This is an area that the Department of Labor is also examining.)

Mental/Behavioral Health and Public Health

People once thought that if we have some kind of health care reform, we did not need a public health system. As public health started running out of money, the focus became primary care. Part of HRSA's goal is to improve public health systems, and at BHPr we are trying to bring back into public health some of the professions that left it. Thus, we are putting mental health back into the public health vision of health.

In addition, we do not pay enough attention at times to the public health systems that deal with populations at the community and state levels, and there has not been much support in the past years to do so. This is still true, but at least we are starting to pay attention to working in our quality initiatives at these levels.

Data Research and Evaluation

Collecting data and conducting research are essential to the further development of health professionals in our nation. So is evaluation, our euphemism for doing better at measuring outcomes. We are starting to look at academic institutions and trying to ascertain what is happening one year, three years, five years later to the students they put out into the real world. I anticipate increasing pressure to find out what is the nature of their practices.

SAFETY ACTIVITIES AT OTHER HRSA BUREAUS

Meanwhile, the Bureau of Primary Health Care has established a Patient Safety Task Force to address patient safety issues. The bureau has completed field tests of "Risk Prevention Skills," a series of discipline-specific, clinical risk management training modules designed to improve the quality of care.

In a public-private collaboration with MedicaLogic, Inc., the Bureau of Primary Health Care will be piloting the use of an Internet-based medical record system with 200 clinicians in 160 of their community health centers.

The Maternal and Child Health Bureau, one of the oldest components of HHS, has received some new monies for its Emergency Medical Services for Children program (EMSC). The Bureau has found that much EMSC response does not take into account the fact that children are not just little people. EMSC is, therefore, looking into the different kinds of equipment and training needed for an emergency medical response to infants and children. For example, they propose to study the effectiveness of the Broselow-Luten Rainbow Care System (BLRS) for pediatric resuscitation. This color-coded system uses accurate precalculated medication doses and equipment sizes.

The EMSC program will also develop a set of clinical guidelines for those practitioners who lack easy access to pediatric emergency specialty services. The guidelines will improve care for common pediatric problems presenting in emergency rooms and doctors' offices.

It is in these many ways that the Health Services and Resources Administration proposes to improve the quality of health professions education, practice, and distribution that, in the long run, will improve the quality of health care in this nation.

8

A PANACADEMIC HEALTH CENTER REFLECTION ON QUALITY AND SAFETY

James W. Holsinger Jr., MD, PHD

Quality of care and patient safety are not new concerns. Nevertheless, something happened on November 30, 1999, the day The Institute of Medicine (IOM) gave birth prematurely to its widely publicized report, *To Err is Human: Building a Safer Health System*. I say “prematurely” because the committee released its report in December, several months early, after learning it was about to be leaked to the media.

The Institute of Medicine recommendations have clearly taken on a life of their own. One would think that the health care professions had never thought about quality of care and patient safety until that day. However, all one has to do is look at the alphabet soup of quality and safety entities mentioned in the report to realize that it builds on a strong earlier foundation laid by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), American Hospital Association (AHA), Institute for Safe Medication Practices (ISMP), and other entities involved in health care.

Indeed, the plethora of quality and safety entities that we see today may have become the problem instead of the solution. How do academic health centers deal with all the advice that arrives daily from this alphabet soup? How do we educate our students and trainees effectively across all of our disciplines? How can we practice safe and effective high-quality health care when some of the advice we receive conflicts?

All of these questions arise at a time when academic health centers are in some of the worst financial shape in decades, and the overall health care system is hanging on financially by the skin of its teeth. I think that one of the first steps to take is to identify a few reliable organizations that we can look to for guidance.

ACCREDITATION AND INSPECTION: THE DIFFERENCE

JCAHO, for example, has been dealing with quality of care and patient safety issues for fifty years. Sometimes we hear, however, that even after a Joint Commission accreditation visit to a hospital, problems show up. Of course, no one believes that accreditation will fix every problem in American health care. When I was the director of an 814-bed Veterans Affairs hospital

in Richmond, I not only underwent Joint Commission accreditation visits every three years on the cycle, but also an investigation by the inspector general at the Department of Veterans Affairs (VA), every three years. Here I saw the difference between an accreditation mentality and an inspection mentality.

The first time four or five representatives of the Joint Commission came to visit us in Richmond, they spent about a week, during which time we learned what we could do better. (They brought good ideas that they had found at other places.)

Subsequently, a team of eight people from the inspector general's office visited us for three weeks. They then took a one-week break, and finally returned for another three-week visit. They came up with twenty-two findings. I have always thought that the best way to deal with the inspector general's office is to fix the problems while the inspectors are there, and then have them certify that they are fixed. In this way, I know that my people have done the necessary work. Thus, by the time the inspectors had left, we had responded to twenty-one of the twenty-two findings; the twenty-second was finished before the first three-month follow-up report.

Three years later, the same eight inspectors showed up for another visit. After three weeks, one inspector told me the team was having a problem, namely, they could not find anything that needed to be corrected. Given that they had done a good job the last time and that we, in turn, had fixed everything reported, I asked why they expected to find something wrong now. The answer was that they "had to find something." On the advice of my regional director, I gave them "something." It was something basically completed. I then told them that it would be done by the time they came back. They went home for a week, came back for three more weeks, and left. This time they had two findings—both of which I gave them.

In sum, accreditation is an effort to help you do a good job and help you move forward to educate your staff so that you can do all you can to offer high-quality care and, at the same time, protect people. Inspection wants to do the same thing, but it has an "I gotcha" mentality. And that is part of our major problem on the issue of patient safety. It is blame and shame.

REPORTING ERRORS

Why did we work at the University of Kentucky for five years on a sentinel-event policy? We did so because we know nobody is going to report error in a blame-and-shame environment. Five years ago there was not a single sentinel event reported voluntarily to the Joint Commission by a health organization. All of the instances they found were found through reports in the media.

Today, we have a new quasivoluntary reporting system in place. A mandatory system will only be feasible for us if Congress passes laws that protect the information we gather or fixes the tort issue. (If the current Administration really wanted to deal with this issue, they would have tort reform sitting up there simultaneously with all their other proposals.)

The current problem my institution faces is what will happen if our information falls into the hands of a plaintiff's attorney. What is it going to cost us? Indeed, can a small hospital or an academic health center on the margin pay for what might happen and still stay in business?

We can understand this problem better when we look at the Department of Veterans Affairs. This department can be very open about its findings because of an administrative remedy. The Federal Tort Claims Act holds that a specific administrative procedure must be invoked before a VA hospital can be sued in a Federal district court. If the same situation held true for the private sector, we would probably eventually settle almost all the issues that come before us. We would not have big legal bills or big judgments or have to cope with the many problems involved in going to court.

I recently learned from a production company that came to film our hospital for a PBS documentary that the local plaintiffs' attorneys had told them that they viewed us as "the toughest nut in town to crack." I explained that this was so because we do not have the same administrative remedies as the VA. If we say something for which we can be held liable, we will soon be in court. We have chosen over the last four years to be hard-nosed on the issue of error. We will not pay if our people have done nothing wrong. We will go to court instead. Since this policy went into effect, we have lost just one case in front of a jury, and that one is on appeal.

Of course, taking this stance does not make us feel good. It is not who we want to be as practitioners. We would like to be open with our patients. We would like to tell them when we make a mistake. We would like to do everything we can to fix the mistake so we can all get on with our lives. None of us wants to do something that hurts a patient. It is not why we are health care practitioners.

THE NEED FOR EDUCATION

What does all this mean for the academic health center? I think that part of the problem revolves around faculties who do not understand quality care issues, continuous quality improvement techniques, or the issues around patient safety because they were never taught about them. Yet, there is room in many of our courses to deal with these issues.

Four years ago, we decided that our faculty did not understand the business of medical practice today and could not teach the next generation of practitioners how to deal with the managed care environment. We, therefore, created the certificate in medical management for every one of our five colleges and our school of public health. This four-course graduate certificate program covers accounting and health economics, health finance, and health organization and practice.

With the release of the IOM report, we are now being asked to change our culture, not just in our academic health centers but across all of American health care. It is a tough job. Changing the culture of an organization is not accomplished overnight. Rather, it is a transition that you set out to

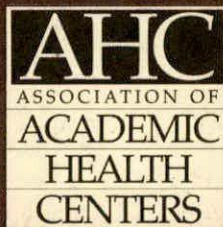
accomplish over a five-year period and then hope that, after five years, you are getting where you want to be. The first edition of *Gray's Anatomy* was based on one body dissected by Dr. Gray, and it has taken us hundreds of years to begin to get the variability of gross anatomy into the textbooks.

We must train ourselves as faculty members before we can ever hope to train the next generation of practitioners. Training our students will not be easy because curricula are tight, but we have no choice. We must develop the necessary research to change systems and to teach based on data. Our patients place a tremendous burden on us, and we have to rise to the occasion. They deserve no less.

First, however, we have to educate our faculty on how to deal with the issues of quality care and patient safety. We must also take the lead in providing quality care and conducting patient safety research. And we have to change our systems, particularly when we can do so based on evidence. We have to go back not only to "first do no harm," but also to the idea that we are here to serve the patients. The patients come first.

There is not a great deal of time to do this. You can see the train rumbling down the track. We are going to have to move and move with dispatch, with care, and with concern. We have to do what it takes to make a difference.

We must remember that not even great practitioners are capable of perfect performance. We are different from the airline industry with its human-to-machine interface. We are a human-to-human interface. We are biological organisms dealing with biological organisms. Blame and shame must give way to full reporting of all errors so that the appropriate research and education can move forward and enhance both quality of care and patient safety. We must make patient safety a priority in our academic health centers. There is no alternative.



Suite 720
1400 Sixteenth Street, N.W.
Washington, D.C. 20036

202/265-9600
FAX 202/265-7514