It Takes a System (Why Being an Expert in Your Profession Cannot Be Enough) Rho Chi Annual Meeting April 3, 2005 by Charles D. Hepler Distinguished Professor Emeritus College of Pharmacy The University of Florida

Almost every professional I know prizes competence. We seek it, we admire it, and we are ashamed if we feel it slip. Rho Chi members have surely worked hard to develop academic competence, which they assume (or, perhaps, hope) will translate into professional competence. I respect and admire that, which is one reason why I am honored to be here today.

For the past decade or so I have been studying the quality of medications use. The scientific, legal and popular press provide many examples of patient injury from medications use, from treatment failure or from non-treatment. Often, these injuries had been blamed on the proximate cause, i.e., whatever or whoever happened to be standing nearest to the event; or on the most convenient scapegoat. Patient injury from medical care, however, is rarely the fault of a single person or even a single event. Drug injuries have multiple causes and are system failures at least as much as personal failures.¹ This has caused me to reflect further on both the nature of professional competence and its relationship to quality.

My talk today will make four points:

1. The quality of health care in America is not what it should be, from clinical, economic, or quality-of-life perspectives. Drug injury, including treatment failure, is a leading type of quality failure. Society expects health care professionals to improve quality of care in all its dimensions and provide high quality care *consistently*

2. A modern pharmaceutical education is a fine foundation, but only a beginning. Circumstances will offer many exciting challenges for continued professional growth for many years to come.

3. Patient care has meaning only with respect to its effect on the patient. Professional knowledge is meaningless unless it is the basis of actions that help a patient. Every practicing pharmacist can make peoples' lives better, can contribute to improved quality of care, and can do more to make this happen.

4. No matter how accomplished a practitioner may become, his or her actual contribution will depend on the actions of patients and other professionals. Improving outcomes, and ultimately the quality of health care in the US, will require us to form patient-centered, cooperative, interprofessional microsystems – *collaborative practices* for short.

Quality of Care

Perhaps you already know the sad paradoxes of health care quality in America. We spend more on health care per capita (\$4,600) and as a percent of GDP (14%) than any comparable nation, almost 40% more dollars per capita than citizens of any other nation on earth. Costs have been fluctuating around 12-13% of GDP for some years but have begun to rise again. Economists predict that they will increase by some 7% annually between now and 2011. Yet these expenditures do not purchase the best results, according to several important measures. For example, twenty-one nations have a lower infant mortality rate than does the U.S.²

Modern definitions of quality are not lofty and idealistic. They are, by definition, achievable. High quality simply means reaching desired outcomes consistent with current professional knowledge. Those outcomes are cure or control of disease or symptoms, with the goal of improving patients' quality of life.

US medical care may often excel in providing brilliant care in dramatic circumstances. It often provides substandard quality of care, however, especially in routine cases or the mundane aspects of care. You may recall Jessica Santillan, a young woman who received a heart-ling transplant at Duke Medical Center. A simple mistake changed the brilliant life-restoring procedure in a tragedy: nobody noticed that the blood types did not match between donor and recipient.^a

The Institute of Medicine (IOM) has stated,

In its current forms, habits and environment, American health care is incapable of providing the public with the quality health care it expects and deserves.³

Most of the examples cited by the IOM seemed to refer to hospital care.⁴ This has lead some people to claim that the problems described by the IOM do not apply to ambulatory care. That is clearly false. The literature shows serious quality deficiencies in ambulatory drug therapy. Drug therapy is used in about 60% of ambulatory care office visits, so it is a major mode of care and may be a good barometer of the quality of ambulatory care.

Furthermore, the current emphasis on safety is incomplete. Improving patient safety, while necessary, cannot be sufficient to meet our responsibilities to patients and society.⁵ The IOM sees quality failures in three main types: misuse, underuse and overuse. "Misuse" refers to poorly executed tests and procedures-- mixups, errors, and flaws -- whether or not the test or procedure was appropriate in the first place. It is the most common category of quality failure in drug use.

Preventable injuries and treatment failures from drug therapy compose a significant part of this problem. Winterstein, et al. published a systematic review of preventable drug related hospital admissions (PDRA) worldwide, including four studies of admissions to US hospitals that met inclusion criteria.⁶ In these U.S. studies, preventable drug related morbidity arising in ambulatory care, including non-treatment and treatment failure, caused from 2.3% - 15.2% of

hospital admissions. The calculated median of the four studies was 7.9%. This would rank inappropriate drug therapy among the top five reasons for hospital admission.⁶ In addition, six studies of preventable drug related morbidity (PDRM) among hospitalized inpatients revealed an incidence from .32% to 3.9% of inpatient admissions, with a median of about 1.5%. The preventability rate ranges from 20% to 56%, with a calculated median of approximately 41 %.¹

Further analysis of the data from the Winterstein et al review was possible on 10 studies in which the authors had broken down the percentage of drug related hospital admissions according to various causes. The 10 studies included data from the US, Australia, France, and Italy. Among these, drug misuse accounted for about 70% of drug-related hospital admissions. Misuse included use of a therapeutically incorrect drug (including a contraindicated drug), continuation after an ADR, inadequate followup, patient noncompliance, and inappropriate use of administration devices.¹ (pp. 64-5)

"Underuse" is failure to provide scientifically proven diagnostic tests, treatments and followup. Underuse was the second most common reason for drug-related hospital admission in those 10 studies, accounting for about (15%). Underuse included, for example, untreated indications, underdosage and treatment failure. Specific examples of underuse are:

Patients with diagnosed heart failure or coronary artery disease who do not receive necessary medications (e.g., ACE inhibitors, aspirin and beta blockers) which can significantly reduce the likelihood of dying from heart attacks.

Patients with diagnosed asthma who do not receive inhaled steroid medications, which can prevent symptoms and improve quality of life for many asthmatic patients.

"Overuse" involves the use of tests, procedures, and medications that are known to be useless or even harmful. In the series of 10 studies, drug overuse accounted for about 10% of drug admissions. Overuse includes the use of a drug with no valid indication, overdose and therapeutic duplication

This is not news to any health professional who is keeping up even minimally. Yet poor quality health care persists, resistant to change in the status quo. The great majority continue to *do* the best we can, trying to *be* the best we can.

Academic Excellence, Professional Competence and Quality of Care

Academic excellence, professional competence and quality of care are core values for most health professions. The relationship between them, however, is not simple. For example, why does poor quality health care remain so prevalent in our society, despite extensive curricular reform and our annual graduation of thousands of first-rate students in the health professions? Likewise, despite an all-too-human tendency to find scapegoats, the balance of evidence shows that patient injury is seldom caused only by professional incompetence. High-quality care

requires more than professional competence; furthermore, professional competence requires more than academic excellence.

Academic Excellence

Based on my 40 years of teaching experience, I believe that most health science students and faculty have high aspirations and most have correspondingly high academic accomplishments. The causes of poor quality do not include a lack of caring or accomplishment by students and faculty. I think that we often meet our academic goals in medical, nursing and pharmaceutical education.

We should ask whether those academic goals themselves are part of the problem. We should question old assumptions about the relationship of academic achievement to personal competence and the relationship of personal competence to patient outcomes today. We should recognize that academic goals may be incomplete, at least as they are explicitly stated and measured. These academic goals affect who gets admitted to school. Then, by striving to reach academic goals we may neglect the development of professional competence and ignore the possible side effects of higher education.

What skills will get you into graduate professional school? Well, obviously, good grades, especially in science and math courses, and a high score on the PCAT, MCAT, or corresponding admissions test. Perhaps some of the basic skills include:

- The ability to do what a teacher tells you to do. Nothing annoys most students more than not being told exactly what to do to get that "A". And, many faculty will mark a student down for coloring outside the lines, no matter how pretty the resulting picture is.
- The ability to choose the correct answer from a list. Most students not only prefer multiple choice tests, they underperform on essay tests and (God forbid!) term papers.
- The ability to recall knowledge. Schools are, however, rarely equipped to stress the corresponding ability to act on that knowledge.
- The ability to work alone cooperation is not highly valued. Teachers and classmates often see cooperation as a sign of weakness, and many forms of cooperation are considered cheating. Moreover, cooperation can be dangerous, because your partner may get the last "A," or even the last position in the program you want to get into.
- School rarely prepares pharmacy students to deal with many issues involving their professional responsibility in a context of cooperation and working in organizations, e.g., self-doubt, intimidation, status and power imbalances, managing your supervisor

Although most professional school enrollments are diverse culturally, they tend to be homogeneous with respect to mind-set. I know this because that's how I got along in academia

for many years, and that's what I expected of my students. As I became more interested in the quality of clinical practice, I began to realize how limiting this mind-set really is.

In contrast, when you get into clinical practice.

- the right questions are at least as important as the answers. The right questions are rarely clear at first. The professional must often sort through a mass of information about diagnosis, therapy and the patient
- the most important questions often have many correct answers. There are no lists of alternatives that contain the right answer. "None of the above" just leads to the next question "well, what, then?"
- there are no trivial facts in patient care. Any fact can be critically important if the circumstances are right.
- "It has been said that more mistakes in medicine are made by those who do not care than by those who do not know.... Compassion is an essential component of high-quality medical care in today's technological world of medicine."⁷
- knowledge without corresponding action is *worthless*. Perhaps you have seen the television advertisement showing a person in a restaurant choking while his table mates discuss the Heimlich maneuver, without performing it on him.
- many solutions can be implemented only with cooperation from others
- the breakdowns and errors that cause patient injury in ambulatory care and in hospitals do not all happen at one point in the process or to one professional group. They are spread out over many steps, many professions, and sometimes the patient or caregiver. Failure of communication and cooperation is often the common root cause.

An illustrative example may help us to understand these points more deeply.

Johnny Jones is an otherwise healthy 10 year old boy with chronic asthma. He is an only child who lives with his mother. She does not work outside the home. His father is a successful salesman who is away from home for extended periods. Johnny has been hospitalized three times in the last five years for asthma. He appears in the ER 3-4 times a year in asthmatic crisis. Each time, physical exam and interview of his parents reveal-- actually, reconfirm – his history. His father smokes tobacco regularly, occasionally in the house when they are having a drink. His mother suffers from chronic depression. She is receiving mental health services, and has a prescription for an antidepressant but often forgets to take her medication. She denies more than occasional social drinking.

Johnny misses a lot of school because of his asthma and occasionally acts out his frustrations with aggression. Although his school permits him to bring his inhalers, its policies require him to visit the school nurse to use them. Consequently, he is reluctant to take his inhalers to school. Mom has received parent education on the care of asthmatic children. She knows that Dad should not smoke in the house. She knows that cockroaches in the home environment exacerbate his asthma, and that she can control the roach population in her home by careful housekeeping, but she is too tired most of the time to even get meals, let alone clean up. They have hired housekeepers from time to time but they never remain for long.

She knows the difference between "preventer" and "rescue" asthma medications, but she does not supervise Johnny's medication use very consistently. The pharmacist has mentioned that she is concerned about Johnny's over-use of the rescue, and his under-use of the preventer inhaled steroid preventer medicine. The pattern shows that Johnny's asthma is not well controlled. This has intensified Mrs. Jones' worries about Johnny and made her unhappy with the pharmacist. She demands that the doctor do more to control Johnny's asthma attacks.

Cases like this are very common, in fact this case is more straightforward than many. Johnny's asthma is just like we teach is pathophysiology. However, essential aspects of Johnny's disease are beyond the scope of the biomedical view. Mom's disease, Johnny's disease and Dad's choice of job and recreation all interact. It is literally possible that Mom's depression can cause Johnny's next asthmatic crisis. The family is in an interconnected system that is virtually impossible for any *individual* (physician, pharmacist, nurse or social worker) to change. It takes a system.

Professional Discipline

Professional educations are incomplete by necessity and by design. In our educations, we learn large volumes of theory and facts. We need to organize the information, make sense of it, and apply it to practice. We can call this a viewpoint, but it's more than that. To echo the ancient roots of our professions in philosophy, I'll call this a professional discipline. Successful teaching of a professional discipline, as part of the professionalization process, often distinguishes a good from a mediocre educational program. Learning a professional discipline is necessary for success in school. Good students learn the discipline very well, in addition to theory and facts.

We learn to see some things and ignore others. That's a good and necessary thing, or we would be perpetually overloaded and confused. Faculty typically see this phenomenon in first-year students– there is too much information and it all seems equally important. As beginning students learn theory, learning facts becomes easier because theories at first help students to organize this mass of information. Later, as the number of theories increases, we need a professional viewpoint or discipline as a way of organizing them. Figures 1 and 2 are examples of what I mean.

Most people see nothing in Figure 1, yet have no trouble seeing the animal in Figure 2 (it's

supposed to be a Dalmatian dog). A few lines added to Figure 2 provide the necessary discipline to the eye, and represent the value of a mental discipline in recognizing patterns.



Figure 1. What Do You See?



Figure 2. Dalmatian Dog Sniffing the Ground

Unfortunately, the greatest benefit of a professional discipline is also its greatest detriment, because we also learn *not* to see, or not to pay much attention to, certain things. Likewise, we may develop some skills, e.g., recall of facts, at the expense of others, e.g., solving ambiguous problems or communicating solutions.

The two figures below are an example of *learned* disciplines that affect a person's skills. When most people who can read English look at Figure 3, the left-hand figure, they see the words,



Figure 3. Federal Express Logo



Figure 4. Modified Logo

FedEx Express, but not the embedded arrow. People who cannot recognize letters, e.g., preschool children, can see the arrow easily. If one either points out the arrow or changes some letters into shapes, as in Figure 4, the arrow is obvious. That's the effect of discipline, in this instance, "reading English."

In his essay, *Aequanimitas*, Sir William Osler said, "In seeking absolute truth we aim at the unattainable, and must be content with finding broken portions." Even then, before the scientific and social revolutions of the 20'th century, one professional person could not see, hear and understand everything he needed. Clearly today, we cannot learn to see, hear and understand everything we need to improve our patient's outcomes. It takes a system.

Professional ''Iron Man'' Culture

A third issue in our inherent incompleteness as professionals is that we learn to be ashamed of, and to conceal, our human fallibility. Even in our area of expertise, we get tired, stressed, have a "bad day." Try as we may, we will commit mistakes, slips and lapses. We will violate rules, even of our own making. We each need to work with others who can detect and correct ("trap") our errors, and who can ameliorate the effects of those that slip through.

According to the 1OM report I mentioned earlier, between 44,000 - 98,000 deaths are attributable to medical error alone in the USA.⁴ This is equivalent to a fully laden 747 commercial airliner crashing every one and a half to four days. The actual chance of dying in a domestic jet flight in the USA is equivalent to flying in a jet 24 hours a day for 438 years before being involved in a fatal crash. By recognizing human fallibility and dealing with it honestly, the airline industry has reduced the frequency of crashes, in particular, those caused by "pilot error." It has increased its safety and effectiveness tremendously over the past decades, and some medical safety experts have looked to the airline industry for lessons.

Studies of airline cockpit crews show that superior pilots tend to be more aware of their limitations than are surgeons, anesthesiologists or nurses. Superior pilots tended to encourage other crew members to question their decisions and actions, were sensitive to the personal problems of other crew members and recognized the need to articulate plans and to train other crew members. The culture of medicine seems to have quite a different attitude about teamwork. Table 1 summarizes a number of large-sample studies by Sexton and his colleagues in the US and Europe.

Table 1. Team Management Issues				
	Occupation			
	Attending surgeons	Airline pilots		
Per cent agreeing with "Even when fatigued, I 70 26 perform effectively during critical times."	70	26		
Per cent agreeing with "My workgroup has high levels of teamwork"	64			
Per cent agreeing with "Junior team members should question decisions of senior team members"	55	94		
From a questionnaire by Sexton, summarized by Pizzi et al. ⁸				

Three quarters of airline pilots in these studies recognize the negative effect of their fatigue on performance, compared to just over a quarter of senior surgeons. Nearly all airline pilots believe that junior team members (e.g., co-pilots and navigators) should speak up when they do not

agree with a vital issue in the cockpit. This compares to a bare majority of surgeons. I do not suppose that airline pilots are naturally more aware of their limitations, or naturally appreciate criticism from junior colleagues. I do suppose that the industry's safety experts have convinced pilots that denying their fallibility, or not speaking up, can kill them and their passengers.

Table 2 summarizes results from a study of more than 1,700 nurses, physicians, administrators, & other clinical care staff during 2004.⁹

Table 2. Nurses' and Physicians' Concerns About Incompetence				
	Occupation			
	Nurses	Physicians		
Concerned about a physician"s incompetence	34	68		
Spoke to subject of concern about the problem	<1	<1		
Concerned about a nurse's incompetence	53	81		
Spoke to subject of concern about the problem	12	8		

Data like those in Table 2 suggest that cultural issues may contribute significantly to poor health care quality. For example, 68 % of physicians in the sample reported that they had been concerned about a colleague's incompetence, but fewer than 1% had spoken up about it. This probably cannot be allowed to continue as a norm. Since there is no Big Brother who can solve this problem for us, each of us should be ready for a new set of expectations about collegiality and teamwork in care teams. This may be another major challenge, since it is a skill that is largely ignored in professional education.

The Reason to Criticize

By now, you may be wondering why I am being so critical of health sciences education and culture. I admit, it seems a bit rude to say these things to students who are still looking forward to beginning their careers as pharmacists and, perhaps, feeling a bit unsure of themselves.

When I entered practice at the age of 21, I thought of myself as a fully formed adult person. The law agreed with me. I'm not sure what effect the preceding comments would have had on me then. I do recall some older pharmacists' telling me that school had taught me little of value and that I needed them to teach me, as they put it, "what pharmacy practice is really all about." I recall how much I resented those remarks. They were wrong then and I would be wrong now if I told you that.

Pharmacy school teaches a great deal of value. My remarks should not increase your anxiety

about practice. Every pharmacist you know has managed to live through the awkwardness of those early days when your license hangs on the wall and your self confidence hangs by a thread.. If you can graduate and pass the board exams, you can surely be – at least -- an OK pharmacist. That's not at issue. The issue is not whether you can get by, but what you can become and what you can do for others.

When I was 21, I did not understand that I would continue to develop as a human being for decades, well into my old age. In fact, in my 30's I was surprised to find so many of my abilities were better than they had been at 21. (I still have that kind of pleasant surprise, although not as often.)

When I was 21, I was unconscious that I even had a point of view. I thought that things were simply as I saw them. People who differed with me were certainly entitled to their ideas, as wrong as they might have been. Only later did I learn that almost everybody is partially right and partially wrong, and that wisdom consists of knowing which parts are right. In particular, students and patients really do know more than I do about their lives and how they live them.

At 21, I wanted to establish myself professionally, get a house and a decent car, and start a family. I believed that if I could reach such immediate goals, I would be happy forever, barring some tragedy. I had been developing so fast in school that I did not imagine how boring life could become if I did not continually renew my goals and aspirations. I soon learned that the good life, for me, required new dreams and aspirations every few years. The worst thing that could have happened to me would have been suddenly to get everything I wanted, without new dreams to take their place.

I have described the differences between education and practice in a context of continual development, of life as a continuing adventure in which the journey is actually more fun than the destinations. To tell you that you will have finished the journey when you finish college would not be a compliment, it would be a curse. To tell you that you have a lot left to accomplish is intended as challenge and a blessing.

It Takes a System

Health professionals offer to heal, or at least to cure or control disease, control symptoms and to improve our patients' quality of life. We can rarely can reach these goals by ourselves, even if our processes are error free. It takes a system.

The practitioners involved in ambulatory care often do work effectively together; but not nearly often enough; the glass of interprofessional cooperation is not nearly half full. Sometimes, a practitioner faced with a complex case may try to cope by a retreat into process. The pharmacist, physician, nurse, etc. can simply carve out an aspect of the problem and carry out his or her functions. For example, the physician can make sure that the diagnosis and the prescription are correct. The pharmacist can make sure that she fills the prescriptions promptly

and correctly and that she tells the patient how to use the medication correctly. And so on. This is encouraged by professional education in the little silos of health professions schools and by professional practices in isolation from each other, in pharmacies, medical and dental offices. The problem is, everybody can do their process well enough to meet professional standards but still not reach the goals of care, e.g., control Johnny's asthma.

Barriers to professional cooperation are many, although we can surmount them.

- Interprofessional cooperation may seem to take time away from our core curriculum or our core tasks. More time may translate into more cost. Unfortunately, most of us have accepted the assumption that improving quality must inevitably increase health care costs. This assumption has been proven wrong time and time again. Higher quality can be free if we are careful about how we improve it.
- Interprofessional cooperation is risky, given the individualistic "iron man" culture suggested above, and especially without a clear alternative structure of roles and responsibilities.
- A retreat into process is easy. To develop the necessary cooperative systems would involve effort and risk. Professional educators and practitioners can remain in these individual silos because, so far, nothing has pushed us out into the world of cooperation, even the knowledge that professional isolation is a failed approach.

The quality of ambulatory care is, after all, largely up to the professionals who provide it. With a few exceptions such as community mental health and home care, there is no accreditation of ambulatory care services to compare with hospital accreditation by the Joint Commission. Because of patient privacy concerns, as symbolized by HIPPA, our work is secret and our records are virtually sealed from review. Managed care has volumes of information about practice patterns but rarely uses it to measure or to improve quality of care.

Outline of a Ambulatory Care System



Figure 5 Relationship Diagram of the People in an Ambulatory Care System

Figure 5 sketches a way of thinking about

ambulatory care that I believe would contribute significantly to improving quality. The system specifies three broad functions that are necessary for care: *initiation*, *facilitation* and *coordination*. The first thing to notice is that these functions are separate from occupational title.

The model does not assume that physicians prescribe, pharmacists dispense, and patients take medicines; it does not limit nurses to a supportive role. The model should include collaborative practice agreements that describe, in broad terms, the roles and responsibilities of each participant.

The names of the functions are largely self-explanatory. Within that framework, each professional has a systematic practice model. For example, the initiator collects subjective and objective patient information, assesses the patient, sets a therapeutic objective and decides on a therapeutic plan. Drug prescribing by physicians is a ready example.

A co-therapist is a professional who is able to understand the medical problem and therapeutic objective; who assists the initiator in carrying out the therapeutic plan, including monitoring the effects of therapy as the plan is carried out. Some nursing activities are good examples of co-therapy, but I think that the best examples are usually found in physical therapy or psychotherapy. Physical therapists, for example, take a general therapeutic plan from the initiator, fit it to the patient's specific needs, monitor progress, encourage patient cooperation in care, adapt the plan to the patient's changing status, and communicate with the initiator. Pharmacists would be ideal co-therapists in drug therapy. In this role they would usually not prescribe (initiate therapy) but would change therapy under protocol in response to patient progress, e.g., adjust warfarin dosages.

Facilitators are lay people who carry out therapeutic plans. This is often the patient himself, but may be a family member, licensed practical nurse, etc. Facilitation is a crucial but often overlooked part of ambulatory care.

This is a cooperative care model rather than a referral model. Information flows among the participants and some decisions are shared. Referrals are made in this model, to obtain advice or request another professional to *initiate* a part of care. (In the latter case, the primary care physician becomes a cotherapist.)

How should the professionals relate in such a model? According to one view, team members should have the following attitudes and behaviors:^b

- individual responsibility for specific processes
- shared team responsibility for outcomes
- belief in personal fallibility
- awareness of patient status, team member status, and available resources.
- peer monitoring (advocacy and assertion)

Collaborative practice has many more dimensions and important issues than I can discuss here. I will simply close with two points. First, this is *not* a radical idea, although even if we do not often practice it. Many aspects of the family practice philosophy represent a systems approach to care. Evidently the pioneers of family practice recognized that they had to deal with the complexity of care by increasing interprofessional cooperation. Also, collaborative practice is an

objective of many nurses and some pharmacists. It is already common, in some versions, in physical therapy and psychotherapy.

Second, specific circumstances obviously will influence the form of cooperative practice. However, young practitioners usually mention professional training as a major influence in their decision making. It seems plausible that interdisciplinary training at the university could lead to collaborative practice later, and therefore, contribute to improving the quality of health care for our citizens.

To summarize,

The quality of ambulatory health care is far less than it should be. I believe that everybody here today, like most health science students, wants to be the best they can be. The question is how best to accomplish that goal. Most pharmacy graduates have, or can easily obtain, all the scientific knowledge they need to be excellent practitioners. The challenge is that the value of additional knowledge in "health sciences" can reach a point of diminishing returns if it is limited by lack of skill in problem solving (e.g., asking the right questions) and communications. Eventually the value even of well-rounded highly competent professionals superiority can be limited by the actions of others. To fully realize our potential contributions, each of us must develop skill in cultivating cooperative group practices and in working within such systems.

Health professionals need to learn two things while they are still in school: the necessity of interprofessional cooperation and how to foster it when they enter practice. Therefore, health science faculty and administrators must do more to foster interdisciplinary education. While that may be too far in the future to benefit today's students, I hope that each student will exploit every opportunity to explore collaborative learning while in school and, eventually, seek every opportunity for collaborative practice. It takes a system.

The evidence on quality of health care in America shows that the health professions are *failing* together. Let's find a way that we can *succeed* together.

References

1. Hepler CD, Segal R. Preventing medication errors and improving drug therapy outcomes through system management. Boca Raton, FL: CRC Press; 2003.

2. Berwick DM. As Good As It Should Get: Making Health Care Better In The New Millennium. Institute For Healthcare Improvement From the IHI newsletter Issue 6, August 2001 ©2002 Institute for Healthcare Improvement . 2004.

3. Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington, D.C.: National Academy Press; 2001.

4. Kohn LT, Corrigan JT, Donaldson MS. To err is human: building a safer health system. National Academy Press; 2000.

5. Woolf S. Patient Safety Is Not Enough: Targeting Quality Improvements To Optimize the Health of the Population. Ann Intern Med 2004;140:33-6.

6. Winterstein A, Sauer BC, Hepler CD, Poole C. Preventable drug-related hospital admissions and morbidity in hospitalized patients -- a meta-analysis of prevalence reports. The Annals of Pharmacotherapy 2002;36(July-August):1238-48.

7. Rakel RE. Compassion and the art of family medicine: from Osler to Oprah. J Am Board Fam Pract 2000 Nov;13(6):440-8.

8. Pizzi L, Goldfarb NI, Nash DB. Crew resource management and applications in medicine. In: Wachter R.M., McDonald K.M., editors. Making Health Care Safer: A Critical Analysis of Patient Safety Practices. Report nr 43. Rockville, MD: Agency for Healthcare Research and Quality; 2005.

9. Maxfield D, Grenny J, McMillan R, Patterson K, Switzler A. Silence Kills: The seven crucial conversations for healthcare. 2005. Vital Smarts. (Pamphlet)

Endnotes

a.http://www.cbsnews.com/stories/2003/03/16/60minutes/main544162.shtml

b.Based on MedTeams principles.

https://patientsafety.satx.disa.mil/ContentStore/DoD%20Brochure%20Final%2010-16-03.pdf