# Diesel gas, rice, and medical errors

**Lynn E. Madsen, Ph.D.**

*The author is a member of the Class of 2003 at the University of Vermont College of Medicine. This essay won second prize in the 2001 Alpha Omega Alpha Helen H. Glaser Student Essay competition.*

I was on my way home from a late pathology lab, in a hurry to be on time for dinner. I swiped the credit card in the slot directly above the pump, and efficiently pulled out the nozzle and stuck it in the neck of the gas tank. I finished, got back in the car, started it, and drove away. Before getting onto the road, the car stalled. Strange. I tried to restart it about twenty times, then coasted down the drive toward the pay phones. I called home, and my husband Michael said he'd come pick me up soon, he and the kids had just started eating without me.

While impatiently waiting, I packed up for home. A random thought—"Hmm, this car's been running well, maybe I should go look at the gas pump, maybe there's something wrong with it."—prompted me to walk over to the neon-lit stage. I took in the big scene—the diesel pump located diagonally furthest away from where my regular-gas-eating car had sat. The huge columns that automatically take credit cards and pump gas were close enough to me now to see the four—not three—gas options from which I had chosen not fifteen minutes before. I flashed on the yellow-paneled diesel choice.

*I had put diesel gas in my car.*

No one needed to point out how stupid I felt at that moment.

Michael drove up, ready to be helpful and resourceful about our broken-down car. I told him right away, "I know what happened. It was my fault. I put diesel gas in the car."

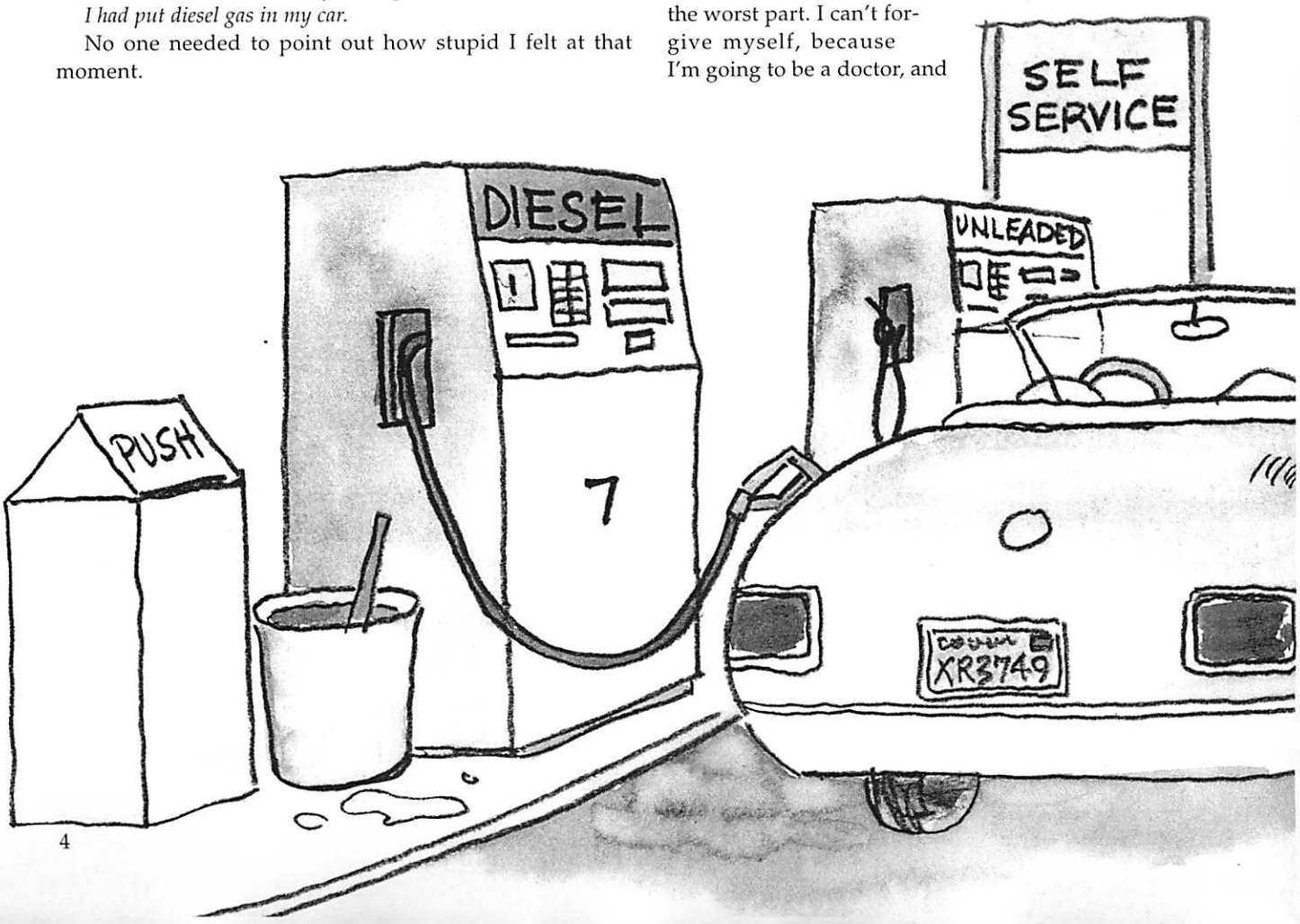
"How could you do that? It's impossible to put diesel gas in the wrong kind of car. They make the nozzle different. I don't believe this!" he said with exasperation.

"Believe it."

He drove the two short blocks over to the Nissan dealership that was still open, and left me in our happily purring other car. I found a radio station playing old Beatles songs, and stared straight ahead as a car salesman kept coming out and opening the door to the car next to me. Was he trying to get a better look at the woman who had succeeded in doing the impossible? The woman who had actually filled—even topped off—her car with diesel gas?

Michael returned, said all the guys, even Mort the manager, had yelled, "How could she do that? It's *impossible* to put diesel in the wrong kind of car, they design the nozzles differently," on and on. Michael added, "I wouldn't show your face in there for awhile if I were you. One guy was rude about it, he even went outside to take a look at you, he couldn't believe my story." Michael had arranged for them to pick up the car tomorrow. They would remove the gas tank, replace the hoses, etcetera.

I said, "Okay, I know I made a stupid mistake, but here's the worst part. I can't forgive myself, because I'm going to be a doctor, and



a doctor can't make this kind of mistake. You know, like I'm in a hurry and tired just like I was tonight, and I give someone the wrong drug, or give a drug to the wrong person. I can't stand making this mistake over a car because of this doctor issue. I just wasn't observant enough."

We went back to the gas station to inform them why the car would be there until morning. The cashier said, "Oh, yeah, that happened to someone else last week." I felt a little better. I wasn't the only idiot.

Michael drove by the pumps after hearing that someone else had made the same mistake. He admitted he could now understand how it happened, and began musing about the station being responsible for our upcoming repair bill.

"No, I made the mistake. It was my lack of observation."

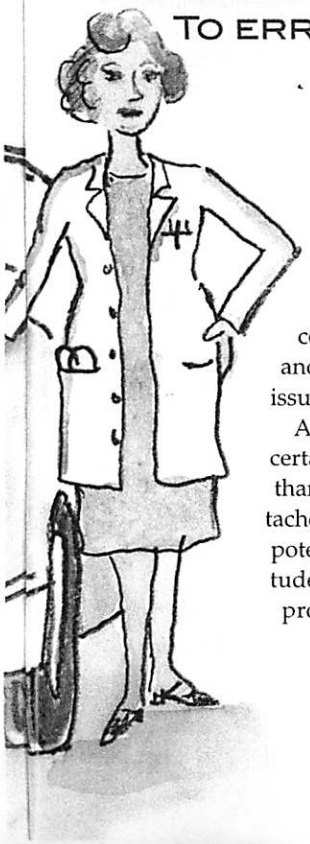
"But it's just like some errors in medicine," he said. "The system is set up so that, inevitably, someone is going to put in the wrong kind of gas. Just like an inadequate medical routine that doesn't have enough checks and balances—some poor doctor will be sued for malpractice, and sometimes the system just needs to change the pumps."

He's a good man, and his words make sense. They don't take away my shame at being human, bound to make errors, even stupid errors with drastic consequences. It's why I used to joke that I don't plan to become a surgeon—I'm too absent-minded. At times like this I think more darkly: do I belong in medicine? Most days, every cell in my body clearly tells me that medicine is where I belong. I'll have to figure out some other way to cope with mistakes besides becoming a perfect person or a perfect doctor.

**By and about the author**

*As an undergraduate at the University of California at Davis in the 1970s, I fell in love with medicine and wholeheartedly pursued it as a career. Strange things can happen. A few of them did; they resulted in a 20-year detour to the Midwest that included a Ph.D. in psychology, a marriage, and three children. Three years ago, I literally woke up one morning with a dream about medical school. The commitment, passion, and love for medicine had never left me. Within a year after that dream, I closed my private practice, was accepted to medical school, and moved my family to our new home, Vermont. I am thriving—living my dream—in the curriculum offered by the University of Vermont College of Medicine. I plan to be a family physician, and to play an active role in medical research and education.*

## TO ERR IS HUMAN.



But what about all physicians? *To Err Is Human*, as the 1999 Institute of Medicine report is titled.[1] Don't we all make mistakes? Yes, but I'm not hearing much about them in my medical training. Every day I receive the message to be careful and methodical and make accurate diagnoses. Is that what this issue is about?

Addressing procedural medical errors would certainly help. Just like the gas station that less than a week later had a huge neon-pink flag attached to the diesel hose, thereby decreasing the potential "diesel error" many orders of magnitude, many medical practices can also be improved, decreasing or eliminating avoidable errors. The Institute of Medicine report and the myriad of responses to it, especially opinion pieces in almost every medical journal (for example, Troyen A. Brennan's commentary in the *New England Journal of Medicine*[2]), emphasize this type of procedural medical error. Better handwriting on prescriptions or computerized prescriptions, standardized hospital procedures, and better communication channels, especially with patient charts—these are ways to decrease errors. They are system errors that only require a better system.

Two concerns arise at this point. First, I wonder about the high level of resistance in the medical profession to implementing these apparently simple procedural changes. Just as the gas station had not marked the diesel pump—why not?—what prevents a hospital from creating simple, cost-effective, reduced-suffering checks and balances in its systems?

Lucien L. Leape has explored this question in several medical venues.[3,4] His premise is that medicine is not fully recognized as a system. Instead, the emphasis has been on highly competent and knowledgeable physicians and other professionals. Thus, an individual makes the error, and the individual is the problem. Leape emphasizes that the system of medicine needs to be acknowledged, valued, and utilized. Then we can reduce errors, absorb and learn from them, and create better procedures as a result. He is one of several researchers to point out comparisons between medicine and the aviation industry, using aviation's successful reforms as an example of how to change a system to reduce errors.[4,5] Leape cites the perspective of errors in the context of individuals' competence and knowledge as a primary reason why errors

**THE AIRLINES ARE FAR AHEAD OF MEDICINE IN DESIGNING SYSTEMS TO PREVENT HUMAN ERROR.**

are not addressed in medicine as they need to be.

I agree with Leape, yet I have a second concern. No matter how much sense it makes to create a better system, in a paradoxical way this type of discussion perpetuates the belief that medicine can be practiced with a perfect or almost perfect track record. What clenches my gut even more deeply is the thought that I will make an error beyond what a system can catch—not due to poor handwriting or the wrong drug or dosage—but due to misunderstanding, or ignorance, or exhaustion, or any number of scenarios, and how will I then live with myself?

In my first year as a medical student, I made my first true medical error. I worked beside an internist a few times a month in her outpatient office. One day the doctor said, "We have someone coming in with a case of worms, I know nothing about parasites, haven't seen a case in eighteen years of practice."

Having just completed microbiology, I had seen a huge number of slides of many worms—had memorized their symptoms, histories, differential diagnoses, and treatments. "Maybe I can help today, I've seen slides . . ."

My mentor is understandably protective of her patients, rarely allowing me to even take blood pressure readings without her supervision and confirming reading. Occasionally, I am allowed to interview a patient, but she re-interviews the same patient afterwards. This time she said, "Great, why don't you talk to Sally first, and then I'll come in after you're done."

After I took Sally's history (she'd been to Africa the year before!) and heard of her symptoms (she found them in her bed two mornings in a row!), and looked at the little off-white wormy things in the plastic bag (probably round worms!), I reported my knowledge to the doctor. "Parasites are often asymptomatic for up to years. Sally's trip to Africa could easily be the source of this situation." We all agreed it was necessary to send off a stool sample for the definitive diagnosis.

I was intrigued—I actually knew some medicine and had applied it to a real-life situation. I called the doctor's office two days later to find out which parasite the lab had reported, and if the drug I knew about had been prescribed.

"Oh, hang on a minute, Lynn," and I heard the receptionist change phones. "Sally called yesterday, and she doesn't have worms. She had a heating pad that had a ripped seam, and it was rice she found in her bed."

I had seen the little baggy with my own eyes, and of course, hearing this, the little off-white fragments were easily identifiable as rice. No harm done here, besides a little extra time and effort and my eating yet another piece of humble pie. Yum! Yet, my entire medical education, residency, and full-fledged practice leaped through my mind—the infinite opportunities ahead to make such mistakes, some with severe consequences.

I must face and accept the fact that no matter what measures are taken to reduce—"eliminate"—errors, unpredictable outcomes occur in medicine. Humanity will assert itself as perhaps beautiful, even heroic; but imperfect, sometimes tragic or ugly. I am baffled by the relative lack of depth to many treatises on medical errors that barely skim over this complexity; our irrepressible foibles, dramas, agonies and ecstasies—our mistakes that can be humorous or disastrous.

How do physicians cope with serious mistakes? Do they report the errors to officials, confide in colleagues or friends?

**"I MADE A TERRIBLE MISTAKE... SHOULD I TELL ANYONE?"**

Studies show any admission of error to any source is the exception, not the rule.[6,7] This quandary of acknowledging mistakes—who to tell officially or unofficially, with or without confidentiality, and what the legal consequences are—is an overwhelmingly confusing aspect of how medicine is practiced. Though ethical treatises exist, no clear ethical or legal guidelines exist for medical institutions or individuals to follow.[8–10] Opinions and practices range from explicit guidelines for reporting errors to complete absence of acknowledgment of errors, sometimes intentionally for legal and professional reasons.

Marshall B. Kapp's legal editorial, "Legal Anxieties and Medical Mistakes: Barriers and Pretexts," highlights the difference between the actual legal consequences of medical errors and the far more damaging fear of imperfection and of lawsuits that permeates the medical profession.[11] Kapp points out the irony that physicians' fears are what ultimately lead to lawsuits, because patients are more upset with lack of disclosure than with hearing the truth. I agree that fear, not error, is the primary problem.

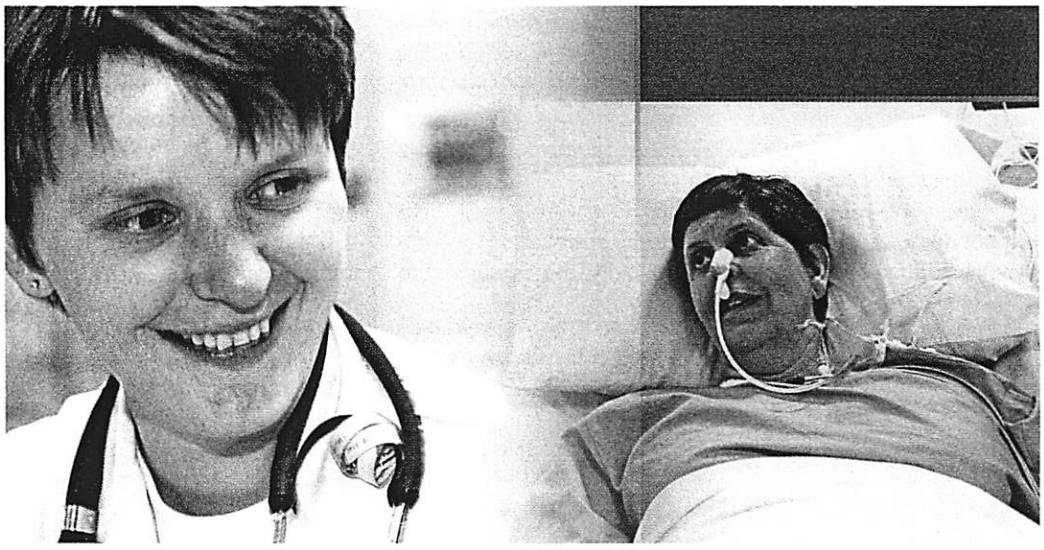
What place does fear have in medicine? Fear is a nonempirical "soft science" aspect of medical errors, difficult to measure and prove. Yet, if we address fear as the emotion it is, then we can move on to constructive action; this approach would provide measurable, tangible, beneficial effects in the long run. Fear of making a mistake—of being imperfect—is cited over and over as a primary reason errors go unreported.[6,7] The fear itself may represent our lack of perfection. Ironically, it takes courage to admit fear, and some brave individuals model this courage.

An example of this approach is found at the Children's Hospitals and Clinics in Minneapolis and St. Paul described in the July 17, 2000 issue of *U.S. News & World Report*.[12] Though anecdotal, the article describes the courage and initiative of the chief operating officer, Julie Morath, who has established mandatory disclosure of medical errors. She enacted this policy in spite of managers' worries about reprisals against physicians from state regulatory boards, and skepticism from physicians who still believe that many errors do come down to incompetent employees. She is creating system changes, but they arise from her personal integrity.

The same article describes the voluntary action of Children's CEO, Brock Nelson, who, after once meeting with the parents of a child who had died and "stonewalling" them, later overrode hospital attorney advice and chose to fully disclose to the parents how a hospital oversight might have contributed to their son's death. He described to them how the hospital had changed its procedures so that this type of error became less likely to occur, and took personal responsibility for the event. The article states that Nelson

> talked about the experience as a painful epiphany. He spoke of how he had acted solely to protect the hospital from legal liability. "I'll never do that again," he told a roomful of senior staffers.[12p66]

Reporting of errors to institutions often takes center stage, but disclosure to patients is an equally vital aspect of medical errors. Albert S. Wu and his colleagues eloquently delineate the ethical considerations of why and how to disclose medical mistakes to patients.[10] One of their primary points is that the doctor-patient relationship is founded on trust—"the fiduciary character of the doctor-patient relationship."[10p733] Though rare exceptions exist, withholding the truth is usually a betrayal of trust that harms the patient, thus violating the "first, do no harm" principle upon which doctoring is founded. How have we veered so far away from trust? Perhaps fear is at the root of this dilemma.



Few research or scholarly studies have emerged regarding these ethical considerations, in spite of the wise words of published physicians such as Wu. Is this because each one of us must personally grapple with how to resolve his or her own ethics and integrity? Perhaps institutions cannot enact this kind of change. It may take the type of personal integrity of individuals like Julie Morath and Brock Nelson to enact this brand of deep-seated change in the medical culture and medical practice. If enough individuals speak plainly about errors (if they confront their fears of imperfection and put patients first), then enough momentum will evolve to cause more system-wide change—a paradox when considering the systems approach put forth by others such as Lucien Leape and J. Bryan Sexton.[3–5]

In contrast to Minneapolis's Children's Hospital, and in its own way just as important in improving medicine's dilemma over medical errors, Daniel T. Risser and his colleagues published an account of an intervention to change the system in an emergency room setting.[13] The purpose of this intervention was to create a true team that would share information both among physicians and all personnel. It was predicted this check-and-balance system would reduce the number of errors, which did occur. The team approach is a subset of the systems approach; changing the system (creating a team) means improved performance.

The above two examples point out the diversity of interventions to reduce medical errors. They have similarities, yet one without the other is an incomplete picture (system effort versus individual effort). I want to participate in a healthy team and in a thriving system. I also want to participate in the internal challenges because even if I am on the greatest team, if I am filled with fear of imperfection I will be in trouble. David Casaret and Charles Helms eloquently describe this need for balance between the individual and the team.[14]

> If house officers work in an institutional culture that identifies error as failure, they may find that errors cut to the core of who they are and what they have accomplished. These forces provide a powerful incentive to focus instead on the system's contributions to errors.... When an institution's culture interprets error as a sign of weakness or incompetence, house officers will be reluctant to examine their own contributions to adverse events. In such an environment, shame, fear, and feelings of inadequacy are predictable responses to errors. It would be unfair, and ultimately unproductive, to expect residents to examine their personal faults and flaws in front of a harsh and unforgiving audience whose verdict is guided by these rules. Only when this culture of perfection undergoes dramatic revision can we expect a balance between internal and external causes of error.[14p21]

The "rules" of shame, fear, feelings of inadequacy—who would want to step into such a snake pit? Perhaps these rules contribute to the avoidance of changing any aspect of the medical system, even the simple measures of improved accuracy of prescriptions. Specifically, Terry Mizrahi's landmark study of house officers delineates responses of avoidance instead of ownership of mistakes. His research describes how house officers respond to errors with adaptations of denial, discounting, and distancing from any personal responsibility.[6] These responses are as adaptive as can be in the short run when severe rules of shame, fear, and inadequacy predominate.

If medicine acknowledged more vulnerability, and if medicine was amenable to comments about how to improve services and training, this issue of medical errors would have unlimited positive potential. This stance, in essence, would be an antidote for shame: perfection would not be the goal; improvement and compassion would be. Fear would be present but not dominate. Inadequacy would be supplanted by competence built on a foundation of knowledge that is allowed to expand and mature. Then the issue would be more simply and factually, "Yes, I've made a mistake," and "How can I now learn from it, improve, and move on?" The key here is to admit to vulnerability. That word, like fear, has little place to roost in medicine, yet it is what will ultimately make us less vulnerable in the long run.

**PERFECTION SHOULD NOT BE THE GOAL . . . CONSTANT IMPROVEMENT OF BOTH SYSTEMS AND THOSE WHO USE THEM SHOULD BE.**

Another aspect of medical errors inadequately addressed is the personal cost to physicians; mental and sometimes physical manifestations of these stresses are documented.[7,15,16] A good portion of this type of stress is related to holding the "secrets" of errors with no opportunity of resolution. Personal costs to physicians are not of primary concern to the general public or medical organizations in charge of their profession. This oversight may be unfortunate, as the personal well-being of physicians ultimately affects the organizations they serve.

Of course, physicians are concerned with how a mistake affects a patient, the family involved, and the entire profession. The irony is that if a physician does not address this issue personally, he or she eventually will be less capable of concern for others. "Physician, heal thyself" is a well-known phrase, but how well heeded? Physicians must grapple with their own mistakes—with being less than perfect, with having limitations, with the uncertainties of life—in order for the changes that Leape and others propose to become fully effective.

How do physicians heal or resolve their personal mistakes? In the midst of conflicting opinions about whether to disclose to patients, colleagues, and friends, disclosure is a known tool of resolution, both for physicians and patients.[10] The medical profession does not outright encourage this behavior, but individual voices do. For example, a strong voice since the mid-1980s, David Hilfiker's articles and books have consistently stated the necessity for confession as an essential part of the physician's professional life.[16]

I recognize the benefit and necessity of confession as I pursue my own resolution to mistakes and fear of mistakes. I have had to actively seek out those who agree and can give me tools to implement resolution. A few articles exist that advocate addressing medical errors in medical training.[8,17] These articles promote development of self-awareness—what goes on inside the physician, as well as how to listen better to patients. These two difficult-to-quantify traits may be the very tools we need to improve medicine in great ways. Token efforts are the norm, however. My education included two hours of lecture/discussion on the topic of medical errors, more than most medical schools offer.

I received six valuable afternoons on interviewing skills, as well. I do not recall my professor making the point that listening to patients would reduce medical errors or reduce litigation, but listening better would indeed produce those results. In the midst of drug protocols and treatment regimens are studies such as those of Wendy Levinson and her colleagues that explore the relationship between malpractice claims and specific communication behaviors of physicians.[18] Better physician-patient communication correlated with fewer malpractice claims for primary care physicians. Perhaps citing this type of study would challenge those of my classmates who consider the soft stuff of talking to patients less important than learning about medications and physiology.

Communication among colleagues may benefit from these

efforts as well. So far in my training, I am rewarded when I admit ignorance. "I don't know" garners a generous response of providing me with even more knowledge, teamwork, and compassion from fellow students and mentors who understand the hazards of perfectionism. I assume this dynamic of admitting "I don't know" will be an advantage with patients as well. I hold on to the hope that if a patient knows his or her doctor is not perfect, but is pulling out all stops to find out more and to help, new possibilities emerge—we will build trust. We will be a team.

## POOR PATIENT COMPLIANCE... WHOSE FAULT? PATIENT OR DOCTOR?

I pay attention to even passing comments during my courses as I seek out wisdom and resources. The other day I heard this: "I couldn't understand why this particular patient was not improving, I'd given her several different medications. It turned out she had never taken any of them, she didn't like the side effects. Now, listen up. In your third year you are going to learn about medical ethics—you're going to find out that patients have a choice about whether they want your treatment." This physician acknowledged he had made the error of not listening to his patient's objections. That was good role modeling. Yet this was only a passing remark, embedded in an unrelated subject. I need more information about these aspects of medicine now. Ethics in my third year? Where are they until then? I keep waiting for any discussion of iatrogenic illnesses and their relationship to medical errors. Where and when do we learn to respect patients' choices, even when we disagree? When will we learn to examine our own assumptions and recognize medicine's limitations?

I want and need more than lip service to these matters. Throughout the stellar basic sciences in which I have learned three times the amount of medicine I expected, I could also have been receiving an interweaving of ethical teachings that would allow me to use that knowledge with more wisdom and respect.

My concerns coalesce in the differences in patients' "compliance" versus patients being informed and choosing their treatments. The distinction between compliance and informed consent is grossly misunderstood and may be the root of many violations of the use of physicians' authority, as well as the root of many medical errors.

The literature provides clear evidence that informed consent—the lack of—is linked to medical errors.[18–20] This power of choice that a patient has by law and ethical guidelines could be the saving grace for much of the pain and suffering involved in medical errors. Why? Because medicine can shift from the old rules of shame, fear, and feelings of inadequacy to new rules of creativity, truth, and shared decision-making with patients.

Albert Wu and his coworkers take this issue further by pointing out that when medical errors do occur, patients need information to make informed decisions about the mistake and its consequences.[10] Informed consent is both a preventive measure and one that helps to resolve errors.

A larger issue is how medicine (and its practitioners) is often perceived as an all-powerful entity, capable of and intent on curing the ills of the world. Kenneth De Ville's review of malpractice in the twentieth century clearly shows how medicine's emphasis on technology has exacerbated the misconception that solutions to any problem will be found as technology evolves.[20] This cycle of unrealistic expectations, sense of betrayal, increase in malpractice claims, and resolution with more realistic expectations dovetails with the issue of medical errors. The human genome project is the most recent example of this phenomenon. Ultimately, uncertainties and fallibility with this technology will dig their way to the surface, again denying perfection. As Dina Pilpel and her colleagues state, "The main barrier[s] to acceptance of medical error as inevitable are professional attitudes that encourage authoritarianism, intolerance to uncertainty and denial of error."[8p5]

I am grateful that mistaking diesel gas for regular gas led me to examine this topic of medical errors. It has become a valuable tool I use during medical training. It inspired me to seek out individual doctors who teach me how to communicate better, who honor the essential need for self-examination—especially regarding medical errors—and who give me "grains of salt" with which to take the claims about curing or eradicating errors. This tool has improved my sanity and fosters confidence in the future. I find comfort in philosophy, literature, and spiritual sources; these resources provide endless encouragement to disclose medical errors and tools to resolve them.

## TEACHERS SHOULD SERVE THEIR STUDENTS BETTER!

Fear still wells up that I will make the ultimate mistake of not knowing something so basic that I will do harm as a result. I must live with this risk, as I am entrusted with medical knowledge and opportunity. This is my growing edge; diesel gas and rice have led me to this point. I take the next steps on this medical path by starting rotations next month. As I am taught about "curing" and "eradicating" disease, I use those grains of salt. And, in spite of Lucien Leape's excellent efforts, I am taught every day that if I am smart enough and careful enough, I won't make mistakes—at least

not the ones that will get me sued.

In the meantime, I drive to the hospital to begin rotations, singing with the radio, ready to learn. I pass the gas station where this all began—the neon flag has fallen off the diesel hose and has not been replaced. The pump waits once more for its prey.

**Dedication**

Dedicated to my classmate Havaleh Gagne—for her questions, open mind, and warm heart.

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# Commentary


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*Dr. Gaba is director of the Patient Safety Center of Inquiry of the VA Palo Alto Health Care System and professor in the Department of Anesthesia at Stanford University. He and his colleagues have brought insight into the problem of patient safety by their emphasis on process rather than people as the points of focus for attention and correction. His paper, "Structural and Organizational Issues in Patient Safety: A Comparison of Health Care to Other High-Hazard Industries," published in the* California Management Review *(2000; 43: 83–102), contains many points relevant to those raised by Dr. Madsen.*


Dr. Madsen's experience at the diesel pump is instructive. The fact that she was able to recognize the system parallels between that experience and the medical world bodes well for the future, although one wonders whether these insights occur as readily to most of her colleagues. The case of the "rice that would be worms" can teach us that our system, imperfect as it is, does have some useful redundancies built in. Even the best trained U.S. internist, when faced with a presumed rare disease, would be ill equipped to be certain prospectively that what was obviously rice in hindsight (outcome bias is *so* strong) was not in fact a parasite in a hard shell form. But the patient did not receive dangerous treatment for her presumed diagnosis. Instead, the "samples" were sent to a laboratory equipped to identify them properly. The patient herself caught her own mistake, illustrating that patients and their families also have a major role to play in ensuring their own safety.

The saddest part of Dr. Madsen's piece is at the end where she says: "And, in spite of Lucian Leape's excellent efforts I am taught everyday that if I am smart enough and careful enough, I won't make mistakes—at least not the ones that will get me sued." What a disappointment to Lucian and the rest of us who have been working so hard for a new paradigm. Suppose she was being taught every day that pneumococcal pneumonia was untreatable or that coronary artery disease was caused by the devil? We would recognize those as falsehoods and wonder at the system of medical education (not to mention of medical treatment) that could perpetuate such notions. As Madsen herself has correctly pointed out, it is now *known* from experience with a wide variety of highly hazardous enterprises that being smart and careful, as important as they are, will by themselves surely fail to deliver the extreme reliability asked of health care.

People and their systems can never be perfect, but systems can be designed and operated with nearly failure free results in extremely hazardous environments—the so-called High Reliability Organizations (HROs). Among the important characteristics of HROs, four are critical: (1) optimum organizational structures and procedures; (2) intensive training during operations and simulations; (3) creating and maintaining active cultures of safety; and (4) maximizing learning from incidents and accidents. Sadly, while health care contains seeds of each of these approaches, and some of the seeds are sprouting, there remains such a long way to go. Ultimately, implementing fully the lessons of HROs may require radical changes in the nature of our health care industry. But the changes can be made. Yes, we need more knowledge of how to do so most productively, but for the most part what we lack is not the knowledge of what to do, but rather the ability to deliver on the changes that we know quite clearly should occur. I can only hope that those of the Class of 2003 will be better able to make this happen than their predecessors. They can start by talking openly about errors and systems, fostering a culture that actively forges safety. The road to optimal patient safety is a long one—and it will never end—but at least maybe now the car (fueled with gasoline!) has left the driveway.

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# Instructions for authors

We welcome material that addresses scholarly and nontechnical topics in medicine and public health such as history, biography, health services research, ethics, education, and social issues. Fiction is not accepted; poetry is welcome, for review. Photography and art with relevance to our quarterly will be accepted for review.

Contributors should note the following information:

1. Papers should be 12-point or larger type, double-spaced, with one-inch margins, and should be submitted in triplicate to Dr. Edward D. Harris, Jr., Editor of *The Pharos*, 525 Middlefield Road, Suite 130, Menlo Park, California 94025. Papers should include an abstract of 150 words or less. The author's return address must appear either on the manuscript or in the cover letter.
2. Contributors need not be members of Alpha Omega Alpha. Papers by medical students and residents are particularly welcome.
3. Manuscripts will not be considered for publication if they are currently under review by or have been accepted by another journal, or have been published previously.
4. Papers that exceed 15 double-spaced pages may be returned to the author.
5. Authors are responsible for the accuracy of citations and quotations in their papers. Once a manuscript has been accepted for publication, therefore, the author will be required to provide photocopies of all direct quotations, from the primary source material, indicating page numbers. In addition, the editors will require photocopies of all references: the title page and copyright pages of all books cited, the first and last pages of book chapters cited, and the first and last pages of journal articles cited, as well as the Table of Contents of the particular issue of the journal in which the cited article appeared. The foregoing items will be used to verify the accuracy of the quotations in the text and the references cited, and to correct any errors or omissions.
6. References, not exceeding a total of twenty, should be double-spaced, numbered consecutively in the text, and cited at the end in the following standard form:

   (Journal) Zilm DH, Sellers EM, MacLeod SM, Degani N. Propranolol effect on tremor in alcoholic withdrawal. Ann Intern Med 1975; 83:234-36.

   (Book) Harris ED Jr. Rheumatoid Arthritis. Philadelphia: WB Saunders; 1997.

   (Book Chapter) Pelligrini CA. Postoperative complications. In: Way LW, editor Current Surgical Diagnosis and Treatment, 9th ed. Norwalk (Conn.): Appleton & Lange; 1991:pp. 25-41.

   Each reference should be listed in the bibliography only once, with multiple uses of a single reference citing the same bibliography reference number. Examples are available at our web site: www.alphaomegaalpha.org.

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