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FROM THE DESK OF THE PRESIDENT

Technology and the Future of Medicine

As a young boy in the 1950s, I tagged behind my father as he saw his patients at his “in home” office. I watched in amazement as he spoke to them as friends and at their gratitude at the end of the visit. I even had the privilege of going on house calls with him. Several years later, at the ripe old age of 12, I even held a retractor as he performed an emergency weekend appendectomy. Yes, no credentials and no waivers, just the word of the patient and the doctor allowing his 12-year-old son to watch. These were the moments that sparked my desire to be a doctor like him. Later that year I would write a term paper on why I wanted to become a “public health servant” as physicians were known back then.

Medicine today, nearly 50 years later, is much different. Scientific advances have allowed us not only to crack the chromosome structure but even map out all the human genome—a feat accomplished only with the advent of computers. We now talk about genetic engineering and the use of nanotechnology to make micro machines to cure diseases and repair disorders in the body. Medical advances have been occurring at a breakneck speed. That biologic engineering may replace mechanical surgical implants in the years to come to cure degenerative disc disease is no longer a fantasy.

Now let’s turn the clock ahead. How will our practice look in another 20 years? I look upon the aviation industry as analogous to the practice of medicine except that we currently practice with turboprops, not advanced jet technology. Former NASS Annual Meeting speaker John Nance showed us how the aviation industry had made flying very safe. The principles they use

can be applied to most aspects of medicine. Through extensive training with simulators, pilots are prepared for their first flight with passengers. Medical students and surgeons will be trained with life-like simulators. We will practice and perfect our skills without making patients our training ground. In fact, through the use of computers and haptics (which enhances realism by adding the sense of touch to robotic or computer-assisted surgery), this is already being employed in teaching various injection techniques.

Will surgeons be like pilots, eg, highly skilled technicians who “take off” or set up the surgery, put the surgery on auto pilot with robotic assistance and then “land” finishing the surgery? Already, cardiac and prostate surgery is being performed robotically with such systems as the DaVinci. The surgeon sits at a control panel and manipulates instruments that scale down his motions, eliminate tremors and “freeze” the heart, for example, through computer imaging! Imagine, these can even be done remotely. We will have our form of real time navigation/image guidance with submillimeter precision similar to satellite technology allowing identification of human faces from 90 miles above the earth. No more just feeling the spine with instruments to determine if the decompression is adequate; instead we will actually see the progress of surgery with more precision than even our best current MIS techniques. Intraoperative CT technology is already here and MRI compatible ORs exist and are being further developed.

What about the nonsurgical care of our patients? Hands-on treatment will never go away, we hope, but with technology, the diagnosis and treatment will be more precise.

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A national database system assuring all physicians' adherence to accepted guidelines will allow additional improvement in quality of care. Physicians will get report cards. If NASS has anything to do with it, as we hope, this grading process will be developed by physicians in conjunction with other stake holders.

With electronic records, safety will rise to a much higher level. Just as pharmacies print up drug interactions for prescriptions, for example, our patients' electronic records will prevent us from missing cues. Patients will carry their medical records in an electronic device such as a radio frequency identification (RFID) chip (possibly embedded in their skin much like currently available pet identification chips. Personally, I wish I had one instead of carrying around numerous electronic ID cards for my office and multiple hospitals.) This data will be downloaded upon the patient's arrival at the doctor's office. No more wondering and playing guessing games as to which drugs and what surgery the patient had because it will be accessible by any physician anywhere. The patient's electronic data will guide the physician to the correct diagnosis and help make sure rare diseases are not overlooked. For example, electronic records will allow incorpora-

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tion of all diagnostic studies and alert the physician who may otherwise overlook the one line of an MRI study that points out an unrelated but possibly fatal tumor of the kidney.

We should not be afraid of electronic medical records (EMR) and artificial intelligence but rather use such technology as an aid to elevate the quality of our practice. EMR will get less and less expensive, and easier to use and implement. Paper charts will become a thing of the past much like the slide rule. Note slips on a desk are already a relic of the past. Our current PDAs and the internet will allow us to have better communication and to be more productive. Patients' problems will be handled more expeditiously. Even today, in many large practices, almost all patient issues and problems are addressed through intra-office e-mail.

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medical care and, I hope, more time to get to know my patients better and focus on their problems. In his presidential address last year, Joel Press discussed the power of physician-patient interaction. Much of our healing, as he reminded us, will always be related to our interpersonal relationships with our patients.

As much as my father's practice was like the Norman Rockwell images of the past, the future of medicine will be much different. The key, however, is to leverage all this technology while maintaining the same or better relationships with our patients. The efficiencies we gain from technology should not be used merely to let us see more patients but rather to enhance our ability to become better doctors. Nothing should ever intrude on the wonderful and priceless bond of the doctor patient relationship that my father taught me so many years ago!