Progress in Medicine and Healthcare

JAMES S. STUDDIFORD '65

I AM NOT a trauma surgeon, HIV researcher, or even a dean of medicine—I am not an expert in any of these fields. However, I am a Vietnam veteran, primary care physician, and professor of Family Medicine. My experiences afford me the ability to comment on select medical advancements as an informed practitioner who witnessed the traumas of war, treated patients during the height of the HIV epidemic, and is now vested in teaching the next generation of physicians. Yes, the decades flew by; as our aging parents declined, as we matured, as our young families thrived, health and wellbeing gradually moved to the forefront. My charge is to reflect on 50 years of healthcare and medicine and tease out the interesting, relevant and, sometimes, painful highlights.

Military Medicine: Advancing Emergency and Trauma Treatment

Got in a little hometown jam
So they put a rifle in my hand
Sent me off to a foreign land
To go and kill the yellow man
—Bruce Springsteen, 1984, *"*Born in the USA*"*

Vulgar and offensive are the lyrics; vulgar and offensive was the war. My orders arrived in 1970, as I was just finishing my internship, on a sunny, peaceful spring day in San Francisco. I had enlisted to serve in the Navy; I was assigned to the Marine Corps and ordered to a duty station on Hill 63, some 29 clicks south of Da Nang. Soon after my arrival I learned that an alumnus from my medical school had just been killed when AK-47 rounds ripped thru the fuselage of his helicopter. I knew it was an unpopular war, but it was the war of my time.

Major advances, particularly in the surgical care of trauma victims, emerged from the Vietnam experience. Progress in combat medicine has direct applicability to civilian emergency medicine. Life-threatening injuries present the same challenges: prompt evacuation to a medical facility and rapid resuscitation by a

James S. Studdiford, MD, teaches in the Department of Family and Community Medicine at Thomas Jefferson University in Philadelphia.

trauma surgeon, harnessing the latest science in radiology, transfusion, wound care, control of hemorrhage, and fluid replacement. One lesson learned in Vietnam was that overly aggressive fluid resuscitation had its downsides, including excessive accumulation in the lungs, causing acute respiratory distress, also known as "Da Nang lung." Hence, standards were revised emphasizing infusion of enough fluid to maintain consciousness and sustain a palpable pulse, but not overload the patient's circulation. Another lesson was to replace lost blood not only with fresh whole blood, but also with specific blood components such as platelets and fresh frozen plasma to enhance clotting and diminish ongoing blood loss.

Consider the medevac to a combat hospital of three Marines, seriously injured on a search-and-destroy mission near our hill circa 1970. The timeline of events was as follows:

9:00 pm: Incoming mortar inflicts multiple shrapnel wounds to the abdomens of all three (small bowel extruding in one); each in shock–pale, cold, shivering, pleading "mother help me"; corpsmen inserting IVs, applying pressure bandages and tourniquets, offering reassuring banter.

9:30 pm: The helicopter slowly descends creating a deafening "clap-clap"; the tailgate drops, casualties are loaded; the Medical Battalion is notified – surgeons and OR nurses prepare–canvas litters are suspended on iron horses, IV poles poised, Type O blood readied.

9:55 pm: The helicopter sets down in Da Nang, arriving within the "Golden Hour."

Rapid transport to the surgical trauma team, and prompt evaluation and treatment to control massive bleeding and shock (poor perfusion of vital organs), was instrumental in saving two of their lives. The other perished. The term "Golden Hour," coined by R. Adams Cowley, M.D., refers to a timeframe regarded as synonymous with improved survival. This trio of Marines would have been little more than statistics had they been injured in the Civil War and taken by horse or cart to military surgeons (often a journey lasting several days). Travel by jeep or other vehicle to medical facilities during WWII (a 12-18 hour trip) likewise would most certainly have proven fatal. These valuable lessons have also had a positive mark on civilian practices and spawned the fields of Emergency Medicine and Trauma Surgery. Current-day Combat Support Hospitals (re-incarnated MASH units), modern military field hospitals, can be transported to war zones and treat hundreds of patients with a full complement of surgeons, CT scanners, and operating rooms. Thus definitive treatment is rendered much sooner within the "Golden Hour."

The main cause of death for victims of both military and civilian trauma remains loss of blood. The control of hemorrhage within the "Golden Hour" by judiciously replacing blood and essential blood components has emerged as the singular most important advance learned during modern warfare. And, for the first time since the Crimean war, a drop in the mortality rate for combat casualties from 20 percent to between 10 and 14 percent has been noted.

Lyme Disease: In Praise of Polly Murray

In the discovery of important infectious diseases identified in the 1970s, the name Polly Murray does not immediately rank with such female medical pioneers as Florence Nightingale, Clara Barton, or Madame Curie. Nonetheless, her singular achievement (captured in her 1996 book, *The Widening Circle*), was to realize that a disproportionate number of arthritic children with swollen, painful knees, residing in the bucolic village of Lyme, Connecticut, could not all be afflicted with Juvenile Rheumatoid Arthritis (JRA). Her maternal instinct prompted the someone-please-listen-to-me mantra that she presented to the Connecticut State Health Department, listing 39 children from Lyme and nearby towns all carrying the presumptive diagnosis of JRA.

Dr. Allen M. Steere, a former member of the Epidemic Intelligence Service of the CDC (the arm responsible for investigating novel diseases like HIV/AIDS and Legionnaires Disease), who was a budding rheumatologist-in-training at Yale University, met her challenge and also found an additional 12 adult patients meeting the same criteria. In these patients afflicted with arthritis, he and his colleague, Dr. Ste-

phen Malawista, ingeniously pieced together such disparate clues as a slowly spreading annular skin rash and seasonal occurrence with a predilection for the summer months, making the tick a likely vector. They established a linkage between the rash and the bite of a specific tick and discovered, in earlier European medical literature, that the rash was responsive to penicillin, thus signifying a bacterial origin. The putative organism, a spirochete identified in 1983 as *Borrelia burgdorferi*, proved sensitive to antibiotics already in widespread use. If allowed to progress to late stages, Lyme Disease causes extensive joint damage and devastating neurologic complications. Today, thanks to the work of Dr. Steere and others, we are able to teach our medical students the essentials of early recognition and treatment. The extent of the knowledge of this and other diseases that we have acquired over the years is truly humbling.

Hepatitis B: Bested by Dr. Baruch Blumberg

The past half-century has witnessed the expansion of hepatitis-associated viruses to include types A, B, C, D, and E. The history of hepatitis B, now both preventable and treatable, deserves special attention. Consider the dire facts: more than a third of the earth's population has become infected, upwards of 350 million people will develop chronic infections, and more than 750,000 people die of it annually (most from liver failure or cancer).

The year 1981 saw the successful pioneering of the hepatitis B vaccine, resulting in a drastic reduction of the threat of infection. Epidemics of hepatitis B, spread by exposure to infectious bodily fluids, date back 100 years. One in 1909 followed the re-use of unsterilized hypodermic needles for the administration of Salvarsan, the "magic bullet" treatment for syphilis. Since then, sterilization techniques have been successfully implemented to halt the spread of infection. Development of the hepatitis B vaccine started in 1966 with Dr. Baruch Blumberg's discovery of the Australian Antigen (later termed hepatitis B antigen). In 1980, the genomic sequence was mapped out, leading to the development of the first hepatitis vaccines.

The vaccine has been routinely recommended for all newborns in the U.S. since 1991. Subsequently, new cases have fallen by 90 percent. In 2011 vaccination for hepatitis B was introduced in 193 countries. Rates of viral carriage and liver cancer complicating hepatitis B fell dramatically. In Alaska, for example, carriage fell from 16 percent to zero. Fittingly, Dr. Blumberg received the Nobel Prize for Physiology and Medicine in 1976 and, arguably, should be placed near the same lofty academic pedestal as Jonas Salk, creator of the polio vaccine.

HIV/AIDS: Sidelined but not Cured

November, 1997: A 44-year-old man with a history of HIV is evaluated for fever, cough, and a chest x-ray typical of PCP pneumonia. He has refused standard antiretroviral therapy because of a prior reaction to an HIV medication, AZT, and now he is refusing hospital admission. Aware that this is a "death sentence" if left untreated, he declines. He leaves the office with a prescription for antibiotics and an anti-inflammatory, saying that his partner has a supply of morphine that he will use it if things get worse.

Single-case reports of seemingly unrelated diseases started to appear in the medical literature in the early 1980s. I recall that an entirely new cohort of esoteric conditions was being linked to this sinister newcomer on the medical horizon—later termed the human immunodeficiency virus (HIV). In these profoundly immunocompromised patients, infections and cancers that even seasoned clinicians would not ever have seen before in their careers became commonplace. These were collectively referred to as opportunistic infections: the result of previously innocuous organisms flourishing in a defective immune system in tissue devoid of defenses. This immune deficiency was determined to be the root cause of clusters of PCP pneumonia and Kaposi sarcoma, diagnosed at the time almost exclusively in homosexual men in New York City and California.

In an age of fear and a paucity of answers, it was initially called GRID—gay-related immune deficiency. The name was accepted in 1981 after agreement was reached among gay community leaders, the

federal government, and the CDC. The disease mechanism, a defect in cell-mediated immunity, was formally recognized and case definitions unfolded. A likely culprit, a retrovirus, was isolated by two different teams of researchers lead by Dr. Robert Gallo, an American, and Dr. Luc Montagnier, a Frenchman. Dr. Gallo is a renowned Jefferson graduate and I was fortunate to be in the audience at his alma mater when he delivered a keynote lecture on his revolutionary discovery. In 1986, the agreed upon name for the virus, human immunodeficiency virus, was adapted, and an HIV blood test soon became commercially available, allowing widespread screening for the vicious disease.

The core public health problems associated with HIV included major medical, social, and political dimensions. These issues were expertly addressed by Randy Shilts in his 1986 book *And the Band Played on: Politics, People and the AIDS Epidemic.* He provided insight into the political infighting that impacted the government and gay community during the 1980s. As time wore on, the AIDS epidemic took its toll: Rock Hudson, Liberace, Freddy Mercury, Tom Waddle, Ryan White, Arthur Ashe, and even Randy Shilts himself. Finally, in 1995, the long awaited HIV cocktail of three drugs, known as Highly Active Antiretroviral Therapy (HAART) became available. By 1997 a dramatic fall in the mortality rate from AIDS had occurred.

The 44-year-old man mentioned above, an actual patient of mine, miraculously survived his 1997 episode of PCP pneumonia and agreed to start HAART therapy. Seventeen years later, he faces new challenges due to cholesterol abnormalities induced by HAART: hyperlipidemia, ischemic heart disease, pre-diabetes, and others. If he stops his HIV therapy because of these metabolic complications, the virus likely will replicate in an uncontrolled fashion and return in a more virulent form. Like many, he has elected to "stay the course." His HIV remains at bay. It is amazing to think that an infectious disease that was once so highly feared and considered a "death sentence" is now treated as a chronic condition not unlike diabetes.

End-of-Life Decisions: Start Now

> *But, it's a long, long while from May to December*
> *But the days grow short when you reach September*
> *When the autumn weather turns the leaves to flame*
> *One hasn't got time for the waiting game.*
> —Frank Sinatra, 1965, "September Song"

Issues surrounding one's own mortality are rarely aired in conversation with loved ones or doctors until a crisis occurs. Usually, the "waiting game" goes on far too long. We live in a society that savors every moment of life, and at times quantity is valued over quality. Physicians are often criticized for falling prey to the mantra of our patients and their family members, "We want everything done." A big part of the medical profession's fault lies in the last-minute delegation of these monumental end-of-life decisions by primary care physicians to specialists such as surgeons, oncologists, or cardiologists who, focused on the specificity of the disease process within their field, often default to "try one more heroic measure." According to Dr. Atul Gawande, author of the current best-seller, *Being Mortal*, we are inflicting more harm than good in our pursuit of longevity. He urges physicians and patients to engage in the end-of-life conversation long before they are in the midst of a deteriorating medical situation. This discussion should focus on improving quality of life by invigorating daily existence rather than making longevity alone the goal.

As illness intervenes, the patient should understand the nature of his condition and be urged to express his fears and concerns regarding the future. The pivotal part of the conversation centers on the question, "When time runs short, what would be an unacceptable outcome for you?" The latter refers to interventions like dialysis, feeding tubes, and respirators. This approach embodies the essence of palliative care and the dialogue enables the patient to make end-of-life decisions early on. Family members should be included as integral parties to the "conversation" and agree to abide by the final decisions, so as to decrease the stress and possible disagreement among care givers and family members in the end.

As a practical example of the above, a patient of mine with longstanding severe rheumatoid arthritis and unrelenting chronic lung disease developed acute kidney failure and was offered thrice-weekly hemodialysis. After only one treatment, he refused further dialysis, declaring that this end-of-life existence was totally unacceptable for him. We had discussed that possibility in previous conversations and he was confident in his decision. He had developed the ODTAA syndrome ("one damn thing after another") coined by Dr. Gawande and died peacefully, on his own terms, three days later. Another patient of mine confronted the final stages of malignant melanoma, which included metastases to the spine which rendered her partially paraplegic. She expressed one final wish to her oncologist—to be kept alive on chemotherapy just long enough to see and feed her three newborn granddaughters in their bassinets on the second floor of their new home. Nearing the end, she abandoned her walker and slowly ascended the staircase to greet the triplets with a broad smile just weeks before her death. Believe me, I was there.

These two cases, with confirmed living wills, lend support to the value of the end-of-life discussion. However, these conversations are rarely embarked upon during routine doctor visits, which is one reason that American healthcare receives a failing grade in the management of the final days of life. Palliative-care consultations and hospice decisions often arrive too late. We should all heed Mr. Sinatra's advice to abandon the "waiting game" and be more proactive, by providing our physicians with our personal list of healthcare "fears and concerns" and "examples of what we consider unacceptable" end-of-life outcomes. Better yet, we should put them in a living-will format, discuss them with our children and significant others, and make copies available to interested parties. And as the final curtain falls, many hospice experts endorse this five point conversation between dying patient and each child: I forgive you. Please forgive me. Thank you. I love you. Goodbye.

End-of-life care exerts a tremendous burden on the Medicare budget. According to 2011 figures, Medicare spending on U.S. health care approximated $550 billion, of which $170 billion or 28 percent was spent on care rendered during patients' final six months of life. With thoughtful end-of-life discussions started earlier, many of these expenses could be eliminated and more patients might be apt to take advantage of hospice care. Currently, hospice care, which offers pain management and emotional care to patients entering life's final phase, is selected by only a third of qualifying Americans. Without it, many patients end up dying in emergency rooms or ICUs instead of in the comfort and familiarity of their own homes.

Electronic Medical Record: Legible Verbiage and Empty Promises

Primed for the capture of health-related information in digital format, the dawning of the 21st century saw the advent of the electronic medical record (EMR). This comprehensive file was designed to contain data ranging from patients' medical history, laboratory tests, and radiology to billing and insurance information. The files were to be populated daily with the most recent information. Legibility would no longer be an issue; prescription pads would be obsolete; consultants' notes would no longer travel by way of the fax machine or Postal Service, but would instead be available in real time.

Prepare for the downside. The promise of EMR patient information being shared in a back-and-forth exchange across different healthcare systems both intra- and extramurally (so called interoperability)—failed to be realized. Consequently, the electronic record of what happens at one hospital system is usually not accessible to a provider at another hospital system. If my patient is seen in the ER of a hospital across the street, I have to once again rely on the fax machine and the many people involved in relaying this information to me. But the bloating of the record kept for an ordinary medical visit (be it a blood-pressure check or a common cold) did happen. A doctor's note replete with a copy-and-paste glut of labs, radiology, and endless, irrelevant system reviews has empowered billing departments to embellish a mundane visit to the doctor into a much higher level of service and to charge accordingly.

The final product, a dazzling clinician's note often several pages long, basically stating "blood pressure normal, continue meds," becomes memorialized in the EMR. Meantime, the vis-à-vis contact between

doctor and patient, the very foundation of all that is embraced by the medical profession since antiquity, has been diminished to near irrelevancy. Eye contact with the patient is significantly reduced as each doctor tests his skills at typing without looking at the keyboard or computer screen. And the physical exam, often an afterthought, is hurriedly conducted on the fully clothed patient, an affront to the traditional teaching of medicine everywhere.

So consider the real case of a 65-year-old lady who lives in a Winnebago motorhome and, with her husband, travels annually cross-country. They both have their entire personal health record (PHR) typed in a 12-point font on one side of an 8.5 x 11-inch sheet of paper. That's right: current and past medical history, medications, allergies, and pertinent studies such as colonoscopies, pathology reports, and labs. It's easy to read, folds up, and fits snugly into their wallets. We should all take a lesson from this couple. The wife also uses her smart phone to take and display select images while on the road, at other physicians' offices, of EMR records that she deems important. She has produced the perfect PHR and receives accolades from every thoughtful physician who sees her. And she insists on a thoughtful physical exam at each visit.