CHAPTER 1

TRENDS IN THE HEALTHCARE INDUSTRY

SECTIONS

Healthcare is preparing to go into hyper-change. Just as the computer and the Internet have enabled "telework," home shopping, and a permanent change in the recording industry's distribution strategy, so will healthcare be affected in the next 10 years.

Events that are unfolding and are leading the change in healthcare are threefold:

- Evolution in the healthcare IT industry
- Introduction of HSA/CDHC and consumerism in healthcare
- Recognition of medical errors as a serious issue in healthcare

This book is not about the evolution of the healthcare IT industry, nor is it about consumerism in healthcare. It is, however, about medical errors, and the counterpoint of the issue, healthcare excellence—specifically, healthcare excellence that can be achieved through Six Sigma.

Trends in healthcare have been evolving in the direction of the customer since the advent of the Internet. One of the first popular search topics was healthcare, and it continues today. We have coined the phrase, "The Wired Retired" just to describe those aging baby boomers who

have helped fuel the most rapid adoption of a technology in the history of the world. These boomers, wired retired, and even the young have not accepted the status quo of healthcare as it has been delivered since the dawn of the medicine man.

This education of the healthcare consumer has, for better or worse, led to the start of a healthcare consumer revolution, which logically leads to the recognition of quality and medical mistakes. This chapter describes some of these trends and how they lead us to Six Sigma.

The Quality Crisis in Healthcare

> **"Hospital Apologizes for Surgical Mistake,"** *The New York Times,* January 19, 2003, by the Associated Press. Linda McDougal, 46, underwent a double mastectomy after being advised by her surgeon that she had an aggressive form of cancer. Two days after the surgery, she was informed that the lab at United Hospital in St. Paul, MN, had switched her lab results with another patient and that Ms. McDougal in fact had never had cancer. Ms. McDougal has been fighting several infections and will undergo reconstructive surgery before she decides whether to sue for malpractice.

Medical errors became a national issue in 1999, when the Institute of Medicine issued a highly published report stating that medical errors in the United States contribute to more than 1 million injuries and up to 98,000 deaths annually. A study by Thomas, Studdert, et al.[1] in *Inquiry* of 14,732 randomly selected 1,992 discharges from 28 hospitals found that medical errors cost an average of more than $65,000 per incident.

The most common medical errors are

- Sepsis infections, which result in a 22 percent higher risk of death and add an additional cost of $57,727 to the hospital stay and 11 extra days of hospitalization
- Surgical wounds, which result in a 10 percent higher risk of death and add an average additional cost of $40,323, plus more extra days of hospitalization
- Medical objects accidentally left in patients
- Adverse drug reactions (wrong or incorrect quantity of a drug given to the patient)

A study published in the *Journal of the American Medical Association* indicated that medical injuries in U.S. hospitals in 2000 led to about 32,600 deaths and at least 2.4 million extra days of patient hospitalization, with an additional cost to the U.S. healthcare system of about $9.3 billion. This is considerably lower than the 1999 study on medical errors reported by the Institute of Medicine that stated up to 98,000 deaths were caused by medical errors. In fact, it doesn't matter what the correct number actually is—even one lost life is one too many!

Although much of the information presented so far relates to the U.S. healthcare system, it is arguably one of the best in the world, and its error rate is probably below average. In some

developed countries, one would assume the healthcare error rate is many times worse than in the U.S. The developing countries error rate is even much higher.

In an article recently published in the *International Journal of Health Care Quality Assurance*, Jim Harrington and Brett Trusko wrote that you are probably safer traveling in Saudi Arabia than lying in bed at your local hospital. In 2003, the best estimates are that only approximately 613 people were killed by terrorists. Our assessment when we wrote the article in 2005 was that by far, healthcare and government (confirmed by the handling of the Hurricane Katrina response) are the two major industries that have the biggest opportunity for improvement in process and quality.

Unfortunately, and even today with all of the coverage around healthcare related to Health Savings Accounts (HSAs), it seems that American consumers care less about the number of people killed due to medical errors than they care about other industry errors such as e-coli, mad cow disease, and airline accidents. As a case in point, let's examine the response to the Firestone/Ford rollover case a few years back. At worst, the problem killed a few dozen people, but it was highlighted on television and in newspapers, and at several times the Federal Government felt obligated to step into the debate. As a result of the bad publicity, Firestone and Ford stock fell. However, the truth is that you are also safer driving your car (with the defective tires) than you are lying in a hospital bed.

Simply put, healthcare needs to be reinvented. Some statistics related to the healthcare quality crisis in America include

- By extrapolating the deaths attributable to healthcare errors in the United States to the global population, we estimate that somewhere between 1.5 million and 2.2 million people die annually as a result of healthcare errors. The low-end estimates of a global pandemic related to bird flu are smaller than those of medical mistakes.[2] However, more money is spent to protect the world from bird flu than medical errors (understanding that the potential deaths from bird flu would outnumber those from errors by many thousands if the direst of predictions come true).
- According to the Centers for Disease Control, 1 person dies every 8 minutes as a result of nosocomial infection, 95 percent of which are preventable (CDC).
- Hospitals with an "atmosphere of mistrust" have a death rate 58 percent higher than average.[3]
- Some 2 million patients per year contract an infection in the U.S. while hospitalized for other conditions, and 88,000 die as a direct or indirect result. This adds an extra healthcare cost of $5 billion.[4]
- In the U.S., healthcare accounts for 15 percent of the GDP and, according to Uwe Reinhardt, a noted health policy expert and economist at Princeton University, that number is expected to be 20 percent of the GDP by 2013.[5]
- According to the Corporate Research Group, healthcare premiums rose only a modest 9 percent in 2005. Historically speaking, this is a small increase. Recent studies suggest that that amount is more in the last couple of years.

- U.S. national healthcare spending is $1.7 trillion.
- Approximately 46.6 million people in the U.S. do not have healthcare insurance.
- The first group of baby boomers is now retiring. This represents some 77 million people entering a time of life when healthcare consumption begins to rise.
- U.S. healthcare consumers pay the highest prices in the world for drugs, therapists, medical diagnostics, and treatment technologies, effectively subsidizing both healthcare research and development and treatment in other industrialized nations, as well as developing countries.
- Patients are uninformed about the quality of service and acceptable standard of care they will receive. This is largely in part due to poor information technologies in the United States. This issue is being addressed with approximately $100 million given to the Healthcare Technology office, which is only a fraction of what has been spent on the Iraq war, Homeland Security, and more importantly, other countries on their healthcare IT infrastructure.
- Geographic location is a significant variable in the quality of care a patient receives because higher quality doctors tend to be attracted to urban locations.
- It takes 15 to 20 years for evidence to be integrated into clinical care.
- Few healthcare facilities are ISO 9000 certified.
- Healthcare fraud and abuse are estimated to cost between $50 and $75 billion per year.
- Performance metrics in healthcare are virtually nonexistent, and there is strong resistance due to nonconformity of processes, regional differences in the way healthcare is practiced, and the fear of loss of business or litigation based on poor performance against metrics. Unfortunately, it is the understanding and communication of this information that helps to solve other problems.
- Indications are that physicians incorporate the latest medical evidence into their treatment decisions only 50 percent of the time, preferring to practice what they are comfortable with.
- Healthcare costs are contributing to the move of jobs off-shore (a tax on employment) with the latest reports attributing $1,200 of the cost of a new American-made car to healthcare premiums.
- According to the World Health Organization, administrative costs account for 15 percent of the healthcare premium dollar, and some studies suggest as much as 25 percent.
- We estimate that 30–40 percent of the cost of waste in the healthcare system is caused by medical inefficiencies and resultant errors.

- According to the Kaiser Family Foundation, the uninsured are about three times as likely as the insured to postpone seeking care, fail to get needed care, leave prescriptions unfilled, or skip recommended treatment. And many end up disabled—or die—because of these delays.
- The U.S. is the only developed country where healthcare is not run by the government.
- Total Quality Management (TQM) and Continuous Quality Improvement (CQI) were at best poorly implemented in most healthcare organizations in the 1980s and '90s.
- There is a critical shortage of nurses.
- The U.S. Government estimates that it can save $140 billion per year through improved patient care and the elimination of redundant tests.
- According to the Institute of Medicine, a total of 2 percent of hospital patients experience an adverse drug reaction, resulting in increased length of stay and $4,700 added in needless expense. This accounts for 2.5 percent of the typical hospital's budget.
- The healthcare error rate is approximately 6,210 errors per million opportunities (3.8 sigma), and for some, treatment activities run as high as a 1 sigma. Compare this with the manufacturing Six Sigma standard of 3.4 errors per opportunity for all processes.
- A patient improves faster at home by 10 to 60 percent than in a healthcare facility.
- In 2002, 13 percent of hospitals reported that they used EHRs (Electronic Health Records) (HIMSS, 2002). Physician office EHR use rates reported in 2002 ranged from 14 percent to a possible high of 28 percent, but there is almost no integration between systems, which is where the real value lies.
- About 20 percent of U.S. products and services' extra cost is caused by the legal system.
- In Canada, medical errors account for 9,000 to 24,000 deaths per year.
- One in four babies born vaginally suffers injury.
- One hip is fractured out of every 1,124 hospitalized seniors.
- Adverse events occurred in 7.5 percent of medical or surgical admissions, 37 percent of which are deemed preventable.
- Australia's adverse event rate is 16.6 percent (the Quality in Australian Healthcare Study Report).
- The U.K.'s adverse event rate is about 10 percent (UK Department of Health).
- Europe's adverse event rate is about 10 percent (European Working Party on Health).
- In the U.K., the average waiting time to get into a hospital is 9 months after the doctor recommends an operation. The government is trying to improve this to 18 weeks.

If this isn't enough to make you stand up and pay attention, then this book isn't for you.

DEMOGRAPHICS: FINANCIAL, POLITICAL, SOCIAL, AND TECHNOLOGICAL

The U.S., and in many respects, the global healthcare system, is in a period of tremendous change. After a prolonged period of technological innovation in the delivery of clinical care and medical advances, the realization has finally hit that delivery of quality healthcare might mean a little more than the latest scanning technology.

Changes in demographics, the political environment, social perceptions of healthcare quality, and information technology have the potential to dramatically change the face of healthcare. The population in the industrialized countries is (on the average) aging, creating issues of financing even more expensive technologies. Because the majority of healthcare in both the United States and the world is financed by the government, political questions related to healthcare delivery have been moving slowly to center stage and is anticipated to be the major focus of many elections in the coming years. Societal norms and values with questions about the quality of life have prompted discussions related to the ability to maintain life regardless of the perceived quality of that life.

While all of these issues will be played out over the next several years, there is a common theme related to the health of not just the U.S. population, but that of a global community—and that is the value and the quality of the healthcare delivered, not just the quantity.

Improved value and quality, which I will refer to as *efficient healthcare*, allows us to address directly or indirectly many of the problems we face in relation to the trends described earlier in this chapter. Efficient healthcare allows us to address the increased needs of a changing demographic in a fair and equitable manner, whether that be the aging of the industrialized world, the changing face of poverty, the uninsured, or the limitations on a government in a publicly financed healthcare system. Efficient healthcare assures us that the financing for healthcare isn't wasted or otherwise expropriated in fraudulent billing schemes or through administrative costs, estimated to be approximately 31 percent of the cost of healthcare in the United States (or approximately $300 billion) in 1999.[6] Granted, much of this is due to bureaucratic and regulatory requirements, but a great deal is also due to the requirements of defensive medicine and issues of quality, especially related to medical mistakes. In a major study by Brennan[7], more than 30,000 patients admitted to 51 hospitals in the State of New York were studied with the finding that adverse events, defined as "injuries resulting from the care process," occurred in 3.7 percent of all patients who were hospitalized. Of the 3.7 percent, 27.5 percent of events were judged to be caused by negligence. Death was associated with 13.6 percent of the occurrences with "a substantial amount of injury to patients from medical management, and many injuries are a result of substandard care." A similar study by Thomas, et al.[8] consisted of 15,000 discharges from Colorado and Utah hospitals, finding that 2.9 percent experienced an adverse event, and 32.6 percent in Utah and 27.4 percent in Colorado led to a death rate of 8.8 percent in the population suffering adverse events. The data from these two studies contributed to the now famous estimate in 1997 by the Institute of Medicine[9] that 44,000 to 98,000 Americans died annually due to negligent care. While the IOM asked for a 50 percent reduction in medical errors in five years, in that initial report the best they could say in 2005 was that we "have a vision in place."[10]

Although the 2004 presidential election held promise for a national debate on healthcare, the war in Iraq and issues of terrorism overshadowed the discussion (which is interesting given

the cost of healthcare and the fact that the number of people who perished in the attacks on the World Trade Center is equal to the number that perish every three days due to medical mistakes). As the nation once again finds its footing, and job losses attributable to the high cost of healthcare are addressed, there promises to be interesting debates in the political arena.

Societal questions remain the great unknown of healthcare quality. Attitudes about healthcare quality are bound to change as society assesses healthcare issues, especially in light of the fact that more and more Americans and citizens of the industrialized world will be faced with difficult decisions regarding the healthcare of their ever-aging parents and friends. Will quality take the place of quantity, or will society demand greater quantity, regardless of the quality? Most likely, there will be greater demands for both quality and quantity, with the likely outcome being greater quality and less quantity.

Technologically speaking, information will be the key to the kingdom of healthcare quality. The 2001 IOM report made ten recommendations, seven of which are dependent on improvements in IT. Worldwide healthcare IT improvements have become a priority with major initiatives in the U.K., Australia, and Canada, to name a few. The United States even appointed a healthcare IT czar. IT improvements are dependent on standards, agreements, and legal modifications centered on the medical record. Dramatic efforts are taking place at the time of this writing, and we anticipate that high quality information in healthcare will become more available within the next five years, creating the opportunity to lay the groundwork for quality efforts today.

Demographics

The single greatest driving force in healthcare is the aging of baby boomers. This population is roughly defined as individuals between the ages of 45 and 62 in 2006. Without a doubt, the aging of the industrialized world and the resultant increase in healthcare consumption throughout the next 40 years will present challenges to governments and societies that have never been seen before. According to actuaries at the Centers for Medicare and Medicaid Services (CMS), people age 65 and older spent $11,089 for personal healthcare goods and services in 1999, while those under 65 spent only $2,793 per capita, with the average person in the United States spending $3,834 per year. As a percent of total healthcare spending, that over-65 population, which is currently approximately 13 percent of the population, represents 36 percent of total healthcare dollars spent. Or stated another way, the $387 billion dollars spent on the over-65 group is quadruple of that spent on the under-65.[11]

Taken as a purely futuristic exercise, we can extrapolate forward that given the estimated percent of those older than 65 expected in the year 2019 to move from an estimated 12.5 percent of the population in 1999 to 15.7 percent of the population in 2019 and to 21.3 percent in 2049 will consume more than half the money spent on healthcare. Regardless of quality improvement efforts, the percentages will remain very high and continue to go higher over time. The most severe implication of this is that healthcare for the elderly is paid in large part by the government (46 percent Medicare and 15 percent Medicaid). If all we consider is the total cost outlay to a government that is already struggling financially, then it is clear to see that Health and Human Services will soon begin to demand value for the healthcare dollars it spends.

Older people consume more healthcare than younger people. Given the shift in the population in the United States, this means that we may see an inflation-adjusted increase (held

constant in today's dollars) in healthcare expenses of greater than $3.2 trillion almost entirely accounted for by the aging population and healthcare inflation (at 10 percent annually). Additionally, the aging baby boomers do not have as many younger people contributing to the Medicare system, which conceivably could lead to several outcomes, including greater borrowing by the government, higher taxes to pay for healthcare for the retired, or in all likelihood reduction in services to the elderly.

Because none of these alternatives is desirable (and perhaps not possible), we have another option: to improve the quality of healthcare dramatically during the next five to ten years, aimed at reducing the costs of healthcare to the entire population, and potentially aim for an actual inflation-adjusted decrease in the cost of healthcare. Quality initiatives can aid in the overall plan to improve quality and reduce costs.

The aging population will lead to a number of other changes in the healthcare system, such as a shift in the spending patterns of healthcare beneficiaries. Not only will the costs go up as older Americans change their spending patterns, but the mix of expenses will change. For example, it is anticipated that as older women move beyond menopause, there will be a large jump in heart disease among females—a condition that is largely ignored in the female population today and, consequently, ignored in general.

Along with shifts in spending patterns, the federal government will find that federal budget allocations will become more and more difficult as healthcare takes an increasing amount of the pie. Current account deficits in the industrial nations of the world will become larger and create real choices between caring for the population and other priorities of the federal government. Given that there is no viable choice to make between healthcare and the rest of the "rest" of the governments' priorities, the only choice is to bring the cost of healthcare down, either artificially through reduced reimbursements (not a realistic alternative), allocations (another difficult choice), or by improving the quality of healthcare to the point where costs are actually decreasing.

One of the great taxes that few know they pay is collected through the government paying for healthcare at a rate below the cost of healthcare, effectively passing that cost on to individuals who are insured or creating a "healthcare tax" that the average individual isn't aware they pay. The fact is that we already have a form of socialized medicine—it just isn't universal coverage.

A potential bright side to the aging demographic is the shift in occupations that will become available to American workers. The baby boomers are the wealthiest population in the history of the world. After retirement and throughout the next 40 years, there will be unlocked wealth on a scale never seen before in history. This wealth will be available to a smaller population, potentially creating incredible opportunities for enterprising individuals who can deliver healthcare and personal services cheaper, better, and faster.

Other Demographic Considerations

Other drivers of healthcare change are related to structural changes in society, such as the rise of immigrants, money in the hands of females, and perhaps most importantly a term used more and more often these days—consumer centric healthcare.

Females

Females in the United States are the primary purchasers of healthcare. It is an unfortunate fact of the U.S. healthcare system that most healthcare delivery is focused on men, a fact that many healthcare providers are beginning to recognize and address. Couple this with the fact that the aging demographic is not only aging, but is living longer, and many of those living longer are females. In fact, the current population of baby boomers will live longer than any generation in the history of the world. Not only will they live longer, they will have problems that we never before envisioned. It is likely that the older female population in 50 years will be higher than today, and also bestowed with the power to change the way healthcare is delivered.

Obesity

In many parts of the world, particularly in industrialized nations, the average weight of the population in steadily increasing. Of particular concern is the increased rate of childhood obesity (or clinically overweight children), which by some estimates applies to almost a third of the population in some countries. Yes, you may want to read that again—according to www.earthtimes.org, fully a third of the children in the U.K. are obese. And what we know about obesity is that people who are heavy generally are sicker than the non-obese person, and that the heavier a person, the less likely they will be to get well once they are sick. Illnesses that strike the obese are diabetes, heart disease, and many related bone and joint diseases.

Racial Diversity

Racial diversification in most developing countries is increasing due to falling fertility rates. While many deny the need, a generally large population of older citizens requires a support infrastructure that is no longer available after the fertility rates drop. This failure to replace the population demands that the society accept ever larger numbers of immigrants from "younger" countries to fill much needed areas in services, manual labor, and healthcare.

Racial diversity creates problems for quality in a healthcare system, where communication is critical to a patient's health. Anyone who has had a very young, sick child can attest to the frustration of knowing that he or she is ill but not able to communicate just what it is that hurts or where it hurts. Racial differences also create a paradigm of standards. For example, an immigrant who has endured extreme hunger might answer differently than a Native American when asked if they are hungry, because the paradigm of hunger would be so different from one population to the next.

So, from the perspective of quality of care, racial diversity can significantly increase the risk to the patient who is of a different ethnic background than that of the caregiver.

Fertility Rates and Racial Diversity

Immigrants influence fertility data in two ways:

- First, regardless of their countries of origin, they tend to have higher fertility rates than do native-born people.

- Second, immigrants are concentrated in the 20- to 39-year-old age group, which is also the prime period of family formation.

Under conditions of low fertility—such as has characterized the U.S. population in the past 30 years—immigration becomes especially important. For example, although Washington State is not one of the major destinations for immigrants, in 1998 about 19 percent of residents giving birth were foreign-born. Long-standing fertility differences between racial and ethnic groups contribute to increasing population diversity.[12]

Worker Shortage

The government's latest projection is that we would need 5.3 to 10 million new healthcare workers by 2010. As the demand for workers increases based on lower fertility rates and an aging population, many see an impending worker shortage in the industrialized world. This shortage may be the largest determinant of how quickly we move to the world of George Jetson (*The Jetsons* being a 1960s cartoon depicting life in the future where robots are in every household and George's idea of a hard day's work is "punching buttons all day"). With a worker shortage, labor becomes expensive, and in a utopian scenario we learn how to be more efficient with our production and services. In some respects, the high cost of labor in certain parts of the world has permanently changed the complexion of the GNP, while areas of the world where labor is less expensive have been able to erode much of the middle class in some countries.

To see how this labor shortage might affect healthcare, we can take the formula:

Demand for workers = Private consumption + Public consumption

As the demand for labor increases with the needs of an older population, the labor market will driven by private consumption, such as hospitals, personal trainers, and grocery store clerks, and through the public consumption of Medicare clerks and government agencies dedicated to an ever-rising population. Of course, because there potentially will be fewer workers, we will find that just as the demand for healthcare professionals and the supporting infrastructure increases, we will have a decreasing number of individuals in the labor pool. This will potentially drive up the price of healthcare and compound the problems of healthcare finance as outlined earlier.

Employment opportunities will generally come in the service sector in the form of nurses' aides, home care aides, and general support for the elderly (such as housekeeping, maintenance, and so forth). Many of these occupations tend to be labor-intensive but require skills beyond those of the average individual walking off the street. In some respects, even the housekeeper is semi-specialized because the procedures for cleaning and servicing patient rooms and common areas are likely to increase as healthcare providers try to get a better handle on infections in the future.

Supply of Workers

Unfortunately for the human resources department in the healthcare industry, the United States has been experiencing a birth rate that is just below the population replacement rate. Therefore, the population in the U.S., without immigration, is going down. This phenomenon is particularly acute in places like Italy and Japan, where birth rates have fallen off significantly

during the last 20 years. In the United States—a nation of immigrants—this means that we have a chance to allow young immigrants to enter the country and fill the worker shortage. In countries like Japan, where attitudes toward non-Japanese immigrants are more negative, there will need to be major changes to accommodate the healthcare needs of an aging population.

In some respects, there is a macabre bright spot in all this. Savings rates in the United States are actually negative. This means that people who previously thought they would retire early may find themselves working many years beyond the age they thought they would retire. This necessity to work is also a potential labor source for the future. The elderly already serve as volunteers in most hospitals, so why not paid employees? Given the laws of supply and demand, these lesser skilled healthcare jobs may pay a living wage in the future.

Therefore, predictions of widespread worker shortages as a result of baby boomers retiring are overstated. Many baby boomers will continue working past the age of 65. Some will work because they do not have enough resources to comfortably retire. This may be because they did not plan well, or because downsizing, outsourcing, or divorce put a hole in their best-laid plans. Others will continue to work, or create new careers after retiring from their primary career. Why? Because they cannot imagine a life without contributing something, and cannot imagine a life without the stimulation a working environment provides. With general advances in medicine, it is likely that healthy seniors will work abbreviated schedules and stay active and vital.

Outsourcing

The outsourcing trend will continue. We have a global market for labor. Any skill that can be taught and that goes into any product or service which can be exported will be exported—both the labor and the product. Outsourced jobs will not come back to this country. This means that the projected labor shortage may not be as large as predicted, either. This also will mean that our labor needs to be incredibly productive, and sometimes older workers are just that.

Consumer-Centric Healthcare

Take all the above demographic changes and throw in the Internet. Some studies suggest that when a customer/patient is experiencing a healthcare incident in their life, they may spend up to 50 percent of the time on the Internet. This unheralded access to healthcare information, coupled with the emergence of Health Savings Accounts, promises to create unique challenges for the healthcare provider in the future.

Financial

Income inequality, or *relative income*, is when the median (half earn more and half earn less) is different than the relative income. In 1969, 18 percent of people earned low relative incomes and 15 percent had high relative incomes. Although a comprehensive report of current relative income awaits analysis of the 2000 census data, numerous surveys suggest that income disparity continued to increase during the 1990s. One survey found that in 1973, average income for the wealthiest fifth of households was $83,000; by 1994, it had soared to $105,000 (in adjusted dollars). For the poorest fifth of households, average income dropped from $8,100 to $7,800.[13]

This inequality of income points to the potential for many more elderly to fall into the charity care category. As more charity care is required, costs shift from those who pay to those who can't. We have recently witnessed a minor backlash against the increasing costs of healthcare, especially considering the public perception that quality is falling dramatically, notably in the United States. Healthcare providers have an advantage that many industries do not have in that when healthcare is needed, it must be purchased. The healthcare industry also has the curse that people generally view healthcare as a right and many do not feel obligated to pay their hospital bills, such as choosing to pay their credit cards before they pay their hospital bills.

The terms *costs* and *expenditures* often are used interchangeably. They are, however, conceptually different. Costs reflect the resources devoted to healthcare that are not available to produce other goods and services. Expenditures are what are paid for health services by purchasers or what is received by providers. The two differ when the payment (expenditure) is greater—or less—than the resources (costs) that go into providing the services. As we dedicate more and more costs to the healthcare system, this means that we have fewer and fewer resources to apply to other problems such as energy independence, the poor, and education. From this perspective alone, the healthcare community has an obligation to deliver healthcare in the most efficient and effective manner possible.

The Pluralistic Healthcare Insurance System

Private insurance coverage dominates the U.S. healthcare system. Most Americans under the age of 65 receive their health insurance benefits through their employer or the employer of their parent or spouse. About 65 percent of Americans fewer than 65 have private insurance, including both group and individual coverage. Most of the remainder are either uninsured or covered by Medicaid. About 4.5 percent (10.5 million) of those under 65 are covered by individual health insurance plans (GAO, 1996), including the self-employed, those not in the labor force, those working for employers who do not offer coverage along with their dependents, early retirees, those who lose their jobs and have exhausted or are not eligible for continued benefits, and dependents of these individuals.

Medicaid covers about 36 million low-income and needy individuals nationally and serves a heterogeneous mix of individuals with diverse needs. Medicare covers 37 million elderly and disabled individuals, as well as those with permanent kidney failure.

This leaves approximately 40 million uninsured individuals in the United States. As previously discussed, these individuals either do not receive healthcare, depend on others to pay for them, or actually pay their own bills. Regardless of exact numbers or how the bills are paid, there are a significant number of individuals who live day-to-day on the brink of either a financial or healthcare disaster—financial for obvious reasons, and healthcare because preventative medicine, prenatal care, and medical conditions are not done, performed, or treated.

Political

The politics of healthcare are complicated. In the early 1990s, the Clinton Administration introduced a bold plan for "fixing" healthcare. The plan never got off the ground because of a combination of the following:

- An insurance industry with a lot to lose
- A "free enterprise" democracy who views "socialized medicine" with skepticism
- A community of practitioners who see socialized medicine as a path to poor quality, long waits, and rationing

This book is not about having an opinion on healthcare policy and politics. It is about pointing out the very real fact that healthcare quality and costs is a major driving force behind political efforts to change the way healthcare is paid for. Politicians see the world's most expensive healthcare with marginal or at least debatable quality. Conventional wisdom basically tells us that the more we spend, the higher the quality. We believe that more expensive cars are generally of higher quality, more expensive food is of higher quality, and more expensive clothes are of higher quality, so this should also hold true for healthcare. Unfortunately, there appears to be little correlation between the cost of healthcare and the quality. In fact, quality luminaries point out that quality is cheap. Higher quality means cheaper healthcare! There does appear to be a lot of factors that affect quality, including defensive medicine, government policy, insurance, socioeconomic profiles of patients, and numerous other factors.

Going back to the Clinton plan of the early '90s, at the time of this book's writing several initiatives in many states are introducing significant changes in healthcare reimbursement and even a little-noticed move by the U.S. Office of Personnel Management to require preferred provider organizations (PPOs) and other fee-for-service plans to collect and report quality performance measures. It will remain to be seen whether anything meaningful will come from any of the state plans or the numerous efforts to require quality data—but the tide is swelling for changes in healthcare generally motivated by the failure of the industry to address its own problems.

Social

Social factors that are motivating a move to quality in healthcare include the increasing number of uninsured, the impact of wellness, and the divergence of aging and disease.

The growing number of uninsured has begun to affect our society as well as our economy. Individuals who are insured are beginning to see the uninsured, right or wrong, as free riders to the system. Most of the insured will not argue that healthcare should not be denied to anyone, but for the first time we may be seeing a change in attitude from the general population. Not an attitudinal change related to distain or anger against the uninsured, but one of concern for the failure of a system that leaves so many people vulnerable.

Another unknown social phenomenon is the impact of wellness. Although we see increasing obesity in the United States and worldwide, we also see the healthier becoming more healthy. Still unknown is the long-term effects of a great number of people who are getting better healthcare and exercising more than any other generation in history. We assume that these later-in-life athletes will develop more long-term injuries to knees and joints but a reduction in conditions related to a sedentary lifestyle, such as diabetes and heart disease. These late-life athletes are understandably concerned about themselves having to supplement those less concerned with their health. Perhaps more so than any other time in the past, we see growing discrimination against the overweight and unhealthy.

Another interesting phenomenon appears to be a divergence of aging and disease. In the past, disease was directly related to age. While this is still generally the case, with the advent of science, new medicines, and better approaches to chronic disease, aging need not be a recipe for disease. Instead, lifestyle, preventative medicine, and improved medical management may significantly affect this paradigm.

Technological

Technology by itself may be the single most important factor affecting healthcare in the future. David Brailer recently resigned as the healthcare IP czar for the United States. Upon his resignation, he noted that his interest in the job was related primarily to improving the quality of medicine in the United States rather than improving technology. In fact, it is impossible to improve quality without improving information. As you will see later in this book, Six Sigma and other quality approaches rely heavily on information to improve processes and quality.

Additionally, technology allows for healthcare breakthroughs and has created the conditions and opportunities for healthcare in the United States to be the best in the world. Given the right circumstances, we have more space-age technology available to us as patients in the United States than anywhere else in the world. Unfortunately, even the best technology utilized in an ineffective way does not necessarily improve quality.

In the long term, technology is the absolute dominant driver in healthcare spending—and thus, employment. Technology accounts for more than half of the growth in healthcare spending per capita over time, and it does so by offering new treatments and diagnostic procedures. Late-life athletes who have trouble with their knees now receive minimally invasive surgery that was unavailable 15 or 20 years ago. Medical care is offering more than it did before, people benefit from it, but it costs more money; however, whether costs are contained or not, it's inevitable that healthcare is going to become a more important source of jobs over time. And that is happening around the world as well as in this country.[14]

The problem with healthcare technology is that one hour of care in the emergency room means one hour of paperwork. It's not a good way to keep content those people who went into the care professions. The U.S. government, as well as several other governments around the world, is aggressively moving on the problems related to healthcare paperwork, lack of IT, and the standardization and digitization of medical records.

The Cost of Healthcare and Six Sigma

The cost of healthcare is a reflection of a number of phenomenon, including a cost-shifting effect from uninsured and "underpayers" (governmental payers such as Medicaid and Medicare that pay essentially cost), increases in infrastructure and medication costs, as well as increased labor and supplies. But all things remaining equal (everyone has to pay higher prices for fuel, for example), the increased costs for healthcare boil down to a few significant issues—a downward spiral, if you will, of healthcare quality erosion (see Figure 1.1).

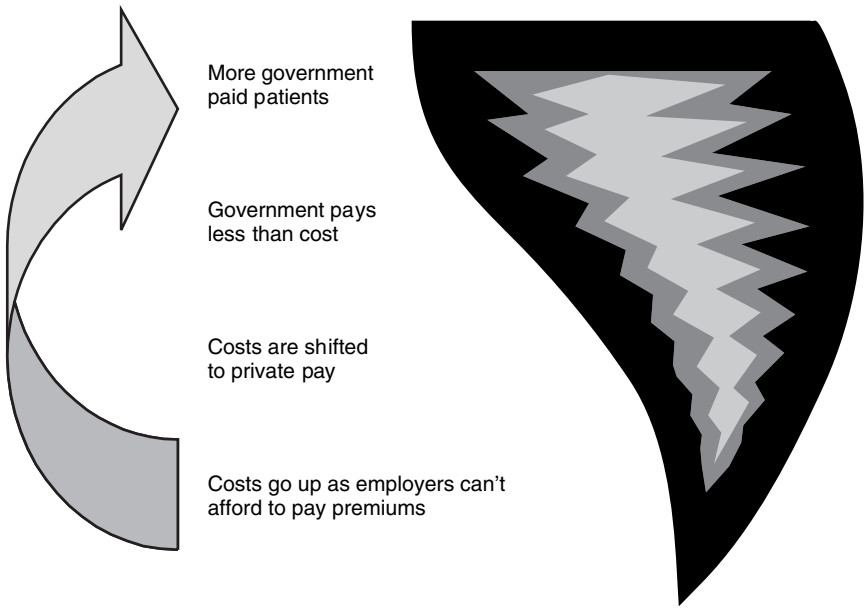

FIGURE 1.1 The cost spiral in healthcare.

The components of the spiral start with the uninsured and governmental programs that pay less than the cost of healthcare. This forces the shifting of cost and those who pay, including private payers and insurance plans. During the 1990s, in an effort to control costs the system created *managed care*. The bottom line in managed care is for an insurance company to contract with a healthcare provider to provide care for a fixed cost. This arrangement effectively removes one source of cost shifting—meaning, traditional health insurance plans and private payers were absorbing increasing costs. At the same time, federal and state governments found that budgets were increasingly running at deficits. Cost-cutting measures by those governments in many cases went to social programs such as Medicaid and Medicare. This reduction put more pressure on insurers and private payers, which continued the spiral.

Today, major employers throughout the United States blame the cost of healthcare for losing a competitive edge in world markets. In fact, many employers have moved operations to places such as Canada, where healthcare is provided by the government. Some estimates in the car industry place the cost of healthcare at 15 percent of the price of a new automobile. Faced with global competition and an ever-frustrated electorate, politicians are beginning to act. Unfortunately, most of the action is not related to increasing the quality of healthcare but to reducing the cost. The understanding that high quality is actually cheaper than low quality has not been recognized. These concepts—reduce costs and improve quality from a Six Sigma perspective—are complementary, not competing. Increased quality leads to lower costs —most importantly in healthcare—and improved experience and outcome for the patient.

Healthcare Quality and Error Reduction

Errors are difficult to measure—not only because of inadequate reporting and varied definitions, but also because most errors are not a single act but a chain of events. For example, prescribing the wrong dose of a drug may be counted as a single error and given a single name, such as a "prescription error," but the physician's prescribing error may have occurred because the medical record contained an incorrect body weight or because a laboratory report was missing. Researchers and administrators ignore the complexity and systems that can produce skewed statistics and propagate imprecise notions about the anatomy, causes, and consequences of errors. A better way to address medical errors would be to develop a cascading model that can be addressed by the Six Sigma approach to process evaluation.

In other words, in a process management environment that Six Sigma promotes, we are not simply looking for the cause of an error for the error's sake; we are instead looking for a total understanding of the process that led up to the error. As many of us have discovered, very seldom do we find anything in this world that is actually black and white—and the same is true of medical errors. Many times the error is caused by a single small and seemingly insignificant error or process breakdown that cascades into something much larger. As an example, consider a lab slip that travels from the unit secretary to the lab, and back to the patient's room. How many opportunities might that slip have had to pick up a bacterial agent in route? Then consider that the slip is dropped in the hallway and picked up by a nurse who then comes in contact with another patient and now cross-infects another patient. It's a seemingly minor incident and, given the frequency of handwashing, it's probably not in your healthcare organization.

This is apparently not the case in Pennsylvania where the Pennsylvania Health Care Cost Containment Council reported in March 2006 that hospitals in Pennsylvania alone reported 13,711 infections during the first nine months of 2005 compared with 11,688 for all of 2004. The infections were associated with an additional 1,456 deaths, 227,000 extra hospital days, and an added $52,600 to treat every patient. As the old saying goes, for lack of a nail, the battle was lost…. Perhaps the saying should be revised to say that for lack of a lab information system, the patient died. Of course, it is irresponsible to suggest that any of these infections were caused by the lack of a lab order information system—but is it any less irresponsible than not finding out why these infections were caused in the first place. To fail to understand the process and the opportunities for "errors" is perhaps the most irresponsible part of the equation.

Why It's Difficult to Deal with Healthcare Errors

If you as the reader are looking for some great insight into why we fail to act aggressively in regards to healthcare errors, the debate has been discussed without resolve for years—defensive medicine.

Defensive medicine merely means that in a litigious society, we order extra tests and don't really pursue the cause of errors as aggressively as we might if it weren't financially devastating to be found guilty of making an error—an error that in most cases could have been avoided had the process been designed so as to eliminate or at least mitigate the opportunity for error.

Consider the multiple stories of hospital operating rooms that amputated the incorrect limb on patients. The best advice I have read on dealing with this blatant process breakdown is for patients themselves to write in permanent ink on the affected limb "amputate this one" and "don't amputate this one" on the other limb. Granted, an amusing story for the press, but a tragic reflection on our healthcare providers when they can't get something as simple as amputating the correct limb right. An even better question is why the patient is advised to do the labeling themselves? It seems to me that we could have figured this one out ourselves years ago. Labeling a limb is a low-tech solution to a catastrophic problem that easily could have been generated by an astute Six Sigma quality team.

Conclusion

Everything in today's healthcare world is pointing to increased costs and lower quality in healthcare. Efforts are being made by the federal government to promote healthcare technology as a shortcut to quality, but as we have seen in the examples, IT is a tool of quality and not quality itself. Patient families and healthcare professionals will still forget to wash their hands, paper will continue to move around the organization, and we will continue to see the incorrect limbs amputated. Only by applying true quality techniques such as Six Sigma to our processes (patient care and administrative) can we begin to proactively address the quality problems in healthcare.

Additionally, and perhaps most importantly, adopting Six Sigma allows the healthcare organization to proactively address process breakdowns before they become life-threatening errors. As you will see in this book, the application of Six Sigma in healthcare is a natural approach to solving many of the problems healthcare faces. The methodology seeks to improve customer satisfaction, reduce cycle times, reduce costs, and improve quality. Six Sigma is different from other efforts in the past since the focus of the improvement is always the patient or other customer. We will talk about why customer satisfaction through reduced variability leads to higher quality and, contrary to popular belief, higher quality is always the low-cost alternative.

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