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Health Care Score Card

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Ten 10-Year Trends for the Future of Healthcare: Implications for Academic Health Centers

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Abstract

The threat to the United States' Academic Health Centers (AHCs) has been reported for the past decade, signified most importantly by the decrease in the perceived value of patient care delivered and a significant reduction in direct payments to physicians in AHCs. These reductions have required AHCs to become more efficient and increased pressures to become more productive in both patient care and research. The U.S. healthcare system continues to evolve in response to these challenges and the additional pressures of increasing costs and the increasing numbers of uninsured. Ten trends for the next decade are evident: 1) more patients, 2) more technology, 3) more information, 4) the patient as the ultimate consumer, 5) development of a different delivery model, 6) innovation driven by competition, 7) increasing costs, 8) increasing numbers of uninsured, 9) less pay for providers, and 10) the continued need for a new healthcare system. In response to these trends, AHCs will have to continue to improve efficiency by increasing cooperation between researchers, clinicians, and educators while demonstrating how they are "different" and "better" than the competition.

The AHC has the tools and the personnel not only to improve patient care processes but also to understand how to decrease costs while maintaining quality. AHCs also have the size and expertise to establish control over geographic market share with services not available elsewhere. Such programs must be able to evolve and respond to market pressures, and the AHC must be an engine of innovation, continuously regenerating new knowledge and programs with "Centers of Excellence" and appropriate industry partnerships. Such progress is driven by better communication and greater sharing of information and collaboration at all levels, including building better physician referral networks. These accomplishments, driven by technology, will allow AHCs to improve quality of care and increase efficiency even under the increasing burden of patients and uninsured. This will position AHCs as the most important advocates and lead players in the development of an improved national healthcare system.

Over the past 10 years, doom has been predicted almost continuously for our nations Academic Health Centers (AHCs). Perhaps the most important threat to AHCs has been the decrease in the perceived value of the patient care delivered by their doctors and hospitals: the payment differential to AHCs in comparison to community physicians and hospitals has virtually disappeared. The most immediate impact over the past 5 years has been a 30% reduction in direct payments for physicians in many AHCs (1).

One positive consequence of these reductions has been the requirement that AHCs have had to look inwardly to demonstrate their own quality in patient care as well as the other missions; they have also been required to become more efficient. Since AHCs

have done this, pressures to improve productivity in both patient care and research have squeezed educators, in some schools placing the education mission at risk, but in others turning adversity to advantage and causing teaching to be treated as a true profession. The other major positive of the last decade has been the almost incredible increase in research funding by the National Institutes of Health over the last 3 years, with a projected doubling between 1997 and 2002.

As we look ahead to the next decade, the United States healthcare system will continue to evolve and may even undergo significant change in structure (2). Healthcare system changes will have important implications for AHCs not only in the patient care mission, but also throughout all the missions.

The significant approaching changes in research and education will be topics of future papers. In the short term, the increasing cost and increased numbers of uninsured will continue to place great stress on the healthcare system. Nonetheless, AHCs will continue to build in programmatic areas relating to translational research from "cell to bedside to community" and in information technology while at the same time becoming even more efficient. In the medium to longer term, AHCs should thrive as the healthcare system changes, the number of uninsured eventually decrease, and AHCs are better able to demonstrate their value. This value can be described by a sphere with true interaction among all areas of mission to improve health in innovative ways, as the researcher brings basic research directly to patient care and the student continues to question making the researcher and the clinician better at what they do, in turn again improving healthcare.

Ten 10-Year Trends for the Future of Healthcare

1. More Patients

As we "Baby Boomers" age, the number of individuals arriving at age 65 will increase dramatically. Ten years from now, more patients will be living longer. The ability to treat patients with chronic disease such as heart disease is clearly lengthening their lives; in the next 30 years, the number of people with heart disease in the United States is expected to double.

2. More Technology

As genetic diagnosis and treatment translate from cell to bedside, the information and armamentarium available to the clinician will increase perhaps inconceivably over the next 10 years. Markedly improved less invasive imaging (e.g., computer assisted diagnosis of coronary artery disease combining echo, magnetic resonance, and positron emission tomography) along with less invasive treatment using catheter techniques will provide better functional outcomes with earlier resumption of activity. DNA chip

technology or genetic fingerprinting will vastly improve risk assessment. Knowledge of the risks will increase the ability of other technology to extend life. Yet techniques such as these will require that we face and attempt to resolve a series of new ethical questions.

Electronic technology will also improve efficiency. The electronic medical record will be tied directly to billing. It will soon be possible for a physician to dictate directly into the record and have software that analyzes the type of visit or procedure and creates a CPT code automatically. Since billing would be directly related to the content of the medical record, the need for complex compliance programs would be markedly reduced. Eventually, software should allow the ability to bill plans automatically regardless of the type of "billing form."

3. More Information

As the technology improves, the information deriving from patient care will also improve. With the Internet and its successors (which among other features will provide the important safeguards for confidentiality), the electronic medical record will not only be able to store patient information but also to provide information on "best practice" instantaneously, whether it is derived statistically from the practice of the physicians in that AHC, or based on health plan data or nationally generated practice guidelines. The opportunities for "online clinical research" are clear. The ability to question large numbers of patients and large segments of the general population may provide overall improved definitions of "quality" from the patient perspective.

Additionally, we will develop better information on severity of disease. Then, the "risk" of the cost of illness for a particular future year will also be better understood. This understanding (and the differential payment that should result) will benefit AHCs since they traditionally take care of patients who are more ill.

4. The Patient Will Be the Ultimate Consumer

As patients surf the web and as employers perhaps no longer choose the health plan for their employees (rather giving them a "defined contribution" to buy their own healthcare), patients will become the ultimate consumers. Measures of patient satisfaction and other patient-oriented report cards will assume increasing importance. An increasing consumer focus could reduce the need for wide geographic coverage of health plans that sell to employers: with the individual choosing the insurance product, patients will choose their own physicians and hospitals close to their own homes.

5. Different Delivery Model

With improved availability of data to the public, process and outcomes will improve. Those not capable of achieving the best outcomes will likely either improve or stop doing the procedure. In the next 10 years, process and outcomes will be optimized for a significant proportion of patients with relatively common diseases. With these patients,

care will become more regularized, making it possible to develop a better understanding of the best care delivery model. For example, it will be possible to measure the outcomes of nurse practitioners, generalist physicians, and specialty physicians in the management of certain diseases and determine the best utilization of each, creating better "hand-offs."

In the long-run, the increase in the number of patients will lead to a great demand for practitioners; the issue will be more one of optimization of the care model rather than negotiating over who will take care of which patient. As the population ages, specialists will be needed in the areas of disease that currently afflict the aging and also in areas of emerging diseases that are now relatively rare but will become more prevalent as other more common diseases become preventable, possibly even leading to the development of new specialties. In 10–20 years, as there may be a shortage of physicians (3) (perhaps even sooner if the trend continues for the 50–55 year old physicians to retire), both the generalist and specialist will need more nonphysician practitioners, who will be especially effective in areas where the care to be delivered is most regular. The need for hospital beds will continue to decrease but ultimately will probably increase again, due to the aging population.

There will be greater self-diagnosis and self-care as patients obtain more information from the Internet. With this information, as well as direct Internet video communication with a practitioner's office, the need to visit the practitioner will decrease. Hospitals will be places for extremely ill patients, with the remainder of patients at home communicating on the Internet. However, as we are learning from adult education, whether technology is available are not, humans want to interact with humans, and while visits may decrease, they will not decrease as much as technology might allow.

6. Opportunity for Innovation

As care for many patients becomes more regularized and process and outcomes data become more similar, competition among practitioners will be based less on who has the best outcomes for common diseases and more on ability to innovate: developing the best care delivery models for patients with common diseases or developing new strategies for patients with uncommon diseases or presentations. Again, this will favor AHCs.

7. Costs Will Increase

While it is clear that in addition to more efficient billing, less wasteful tests and procedures will be done as better information on appropriate care becomes available, and more efficient care models will emerge with technology for care of patients at home, these improvements will be dwarfed by increasing costs. Consider the cost of doubling the number of patients with chronic cardiovascular disease, currently 13% of medical care costs. A recent analysis on the "magic bullet" that could prevent atherosclerosis reveals that the drug would not save money, since individuals will need to take what will likely be an expensive drug for their entire lifetime (3).

8. Uninsured Will Increase

As costs rise, the major payers in the private system, the employers, will attempt to reduce their costs by reducing coverage and increasing the burden to the employee. As premiums continue to increase, workers will be less able to afford even basic health insurance, and the ranks of the uninsured are likely to increase. As these numbers increase, the cost of caring for the uninsured will increasingly be shifted to AHCs, as well as the government and private insurers, thus increasing the cost of healthcare coverage and increasing the uninsured in a vicious circle.

9. Providers Will Be Paid Less

All providers are being paid approximately the same amount by the majority of payers, whether the government or private insurers. As costs increase, health plans will pay the increases to those they must and reduce payments to the others. The priorities for payment will continue to include their own administrative costs, pressures on the bottom line for private plans to make profits, and payments for new drugs and devices; providers will be given what is left unless strategies are developed to demonstrate value and increase market share.

10. Need for a Healthcare Reform

Between 5 and 10 years from now, the situation will become critical for Americans. The costs for employers will continue to rise, causing many to desire exiting the healthcare business; the number of uninsured people will also continue to increase with a widening gap between what can be afforded and what is available. The ranks of the uninsured will extend into the present middle class. These disenfranchised individuals, and their employers, may vote for a change in the healthcare system. We have recently described how that system might achieve healthcare coverage for all by 2010 (2).

Implications for Academic Health Centers

Over the next several years, strategies must be developed to ride out the decreased patient care revenue, increased uninsured, and increased competition on the basis of price and increased expense on technology.

The first strategy is to "push back" against the squeeze in prices by demonstrating to the patient that the AHC is "different" and "better." The AHC can and should be the engine that drives improved health in the United States. The interdependent parts of the AHC mission allow the development of knowledge in the laboratory, the application of knowledge to patients, and the teaching of that new knowledge to established physicians as well as physicians in training. Thus, it is the AHC that will improve quality of care. The AHC has the tools and the personnel not only to improve patient care processes, but also to understand how to decrease costs in providing care while maintaining quality. AHCs should take these functions back from managed care

companies and thus demonstrate their value as an important resource worthy of legislative, financial, and philanthropic support. The second strategy is to control geographic market share.

"Push Back"

Different

AHCs provide a certain number of services that only they can provide by virtue of their "quaternary" nature. These programs are almost always related to research and generally occupy a niche that people cannot obtain locally; consequently, patients are willing to travel from surrounding states. These programs have a relatively short shelf life since other hospitals may be able to apply similar protocols to similar patients. The AHC must, therefore, be an engine of innovation and continuously regenerate the next new knowledge in current quaternary programs and birth new quaternary programs as well. It will be important for AHCs to demonstrate innovation to patients and physicians by developing new ways to describe new techniques and treatment. Continued innovation can also be fostered by appropriate partnerships with industry. If an AHC is the first to have a new drug or device available to treat patients, this benefits the patients and the AHC. With even a few of these relationships and breakthroughs, the halo effect that "this is the place to be" for advances in care for sick patients will be an important differentiator for the AHC and ultimately a good negotiating tool in determination of pricing with health plans. While quaternary programs can demonstrate that the AHC is "different," these hospitals and doctors cannot survive by quaternary programs alone.

Better

The AHC (including its affiliated community hospitals) also needs to demonstrate that it is "better" at tertiary care. AHCs should therefore create visible Centers of Excellence that are large and multidisciplinary. The size, breadth, and depth of a tertiary program in, for example, heart disease can dwarf most local hospitals. Combined with quaternary programs, two or three truly outstanding Centers of Excellence may be all that is required for the halo effect to steer patients in the direction of the AHC.

AHCs can also be "better" by improving both the effectiveness and efficiency of patient care. AHCs should develop centers for health services research that integrate with quality improvement programs and clinical research to create not only protocols for efficient patient care and demonstrating outcomes, but also integration of new drugs and devices into these protocols. The AHC's electronic medical record can facilitate the identification, enrollment, and analysis of large numbers of patients into cutting edge research protocols.

The support from health services research programs can form a core of individuals to support these other areas. The health services research group can help to develop outcome measures to test the hypothesis that these process and outcomes data are better than those of the local competition. In many cases, local benchmarking data may not be available, but an AHC that demonstrates leadership in a particular area of outcomes establishes a gold standard that others will have to meet. Many local hospitals may not be able to collect or produce these data, thus, in themselves, providing an advantage for the AHC. Collection of data regarding physician effectiveness and efficiency across patient care, education, and research also has proven helpful in providing feedback to the physicians and their leaders (1). If it is found that the AHC is not competitive in either process or outcomes data or most certainly in service standards (such as the time to the next appointment and patient satisfaction), the AHC must take active steps to improve in all of these areas. One slogan that we have advanced for this effort is *go get lots better and prove it*.

A third way in which AHCs can demonstrate they are "better" is by providing information to physicians and patients. Patients are vitally concerned with access, and the AHC can develop web tools to improve scheduling in all departments and centers. Eventually, patients should be able to schedule appointments on the web. They should be able to access laboratory data; and for those without computers, technology is available that allows laboratory data to be telephoned into a system that leaves test results in a secure voice mail system, which patients can access. AHCs can also provide health information to patients as a service, and become a trusted source for information, helping patients through the interpretation of Internet data. AHCs should take the lead in devising web technology to care for patients at home, especially elderly or indigent patients who may not be able to travel but who will likely have inexpensive and simple Internet access. AHCs can take the lead in creating automated billing systems that will be attractive to health plans and also potentially to patients. For physicians, the development of an electronic medical record allows earlier demonstration of outstanding outcomes and can also provide instantaneous feedback on their practice and the means to improve it. As the electronic medical record becomes tied to more physician data and information, it will become a valuable tool to attract physicians to a health system without the practice necessarily being purchased. While these investments in information technology will be expensive, AHCs are more likely able to afford them than some local hospitals, and therefore the use of this technology may establish the view that the AHC is better than the local competition.

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Control Geographic Market Share

As the individual patient begins to choose his or her health provider directly rather than through an employer, the need for employers to contract with widely distributed networks will decrease. Therefore, a new strategy will emerge: AHCs will need to control market share in one or more geographical areas. If the AHC is the only provider for a population within a certain distance, it is likely that patients will choose the AHC.

To control geographic market share, quaternary and tertiary hospitals in an area (the size of the area determined by geography and population) should consider "collaboration." This collaboration does not necessarily imply merger. If even process and outcomes data are shared across hospitals and physicians using internal benchmarking, improvements will occur. If medical services further concentrate, to the extent that certain outcomes are dependent upon the number of procedures performed, outcomes may again improve.

The size and location of the physician referral network of the AHCs is also important to control the geographic market share. Since most physicians practice in hospitals relatively close to their offices, it will be important to attract physicians whose offices are close to the hospitals in the geographic area. Traditionally, referring physicians have been thought of as primary care practitioners. However, as the care models improve, it is likely that not only will primary care physicians (or nonphysician practitioners) refer to specialists, but once again specialists will refer to specialists. An emerging player in the referrals is the patient. The number of self-referrals will likely increase, and systems will be needed to deal with these self-referrals appropriately. As the required geographic distribution of the AHC for tertiary care is better understood, it may be necessary to site specialists in offices at a distance from the main quaternary hospital.

In addition to the network of physicians physically close to the AHC, a "virtual" network for referrals beyond the geographically close network should be developed. The techniques for attracting both geographic and virtual referring physicians will be similar, including shared electronic medical records (with appropriate confidentiality), methods for obtaining rapid referral and rapid appointments; shared best practice data, practice guidelines, and quality infrastructure; personalized Continuing Medical Education; shared marketing and perhaps other office functions such as billing (especially if the AHC has automated billing processes); and, finally, shared access to research protocols and learners.

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Conclusions: Light at the End of the Tunnel

The benefits to riding out the storm will be an increased ability to demonstrate quality at a time when quality will be better understood, improved patient care and service at a time when patients will potentially be the direct consumers of healthcare, and clearly improved administrative systems that will be capable of handling larger numbers of patients with electronic medical records and billing systems. Such administrative capability, provided by investment in information systems, will form a major part of the strategy for AHCs over the next 10 years.

With decreasing margins in patient care and increasing numbers of uninsured, the physicians and administrators of the AHCs can become more effective and efficient in their practices – but this may not be enough: they can become important advocates on behalf of their patients for an improved healthcare system. Coverage for all is clearly

beneficial to patients and physicians, allowing access and administrative simplification. Employers also benefit: in Texas in 1994, the parents of uninsured children missed 600,000 more days of work than the parents of insured children (4).

The light at the end of the tunnel is the engine of the AHCs which will improve the health of our patients through innovation, not only in the maintenance of health and treatment of disease but also in proposing, piloting, and advocating new systems that deliver appropriate care to all Americans.

The Rising Cost of Health Care by Year and Its Causes

•••Sam Edwards/Getty Images

By Kimberly Amadeo

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In 2017, U.S. health care costs were $3.5 trillion. That makes health care one of the country's largest industries. It equals 17.9 percent of gross domestic product. In comparison, health care cost $27.2 billion in 1960, just 5 percent of GDP. That translates to an annual health care cost of $10,739 per person in 2017 versus just $146 per person in 1960. Health care costs have risen faster than the average annual income. Health care consumed 4 percent of income in 1960 compared to 6 percent in 2013.

What Caused This Increase?

There were two causes of this massive increase: government policy and lifestyle changes.

1. First, the United States relies on company-sponsored private health insurance. The government created programs like Medicare and Medicaid to help those without insurance. These programs spurred demand for health care services. That gave providers the ability to raise prices. A Princeton University study found that Americans use the same amount of health care as residents of other nations. They just pay more for them. For example, U.S. hospital prices are 60 percent higher than those in Europe. Government efforts to reform health care and cut costs raised them instead.

1. Second, chronic illnesses, such as diabetes and heart disease, have increased. They are responsible for 85 percent of health care costs. Almost half of all Americans have at least one of them. They are expensive and difficult to treat. As a result, the sickest 5 percent of the population consume 50 percent of

total health care costs. The healthiest 50 percent only consume 3 percent of the nation's health care costs. Most of these patients are Medicare patients. The U.S. medical profession does a heroic job of saving lives. But it comes at a cost. Medicare spending for patients in the last year of life is six times greater than the average. Care for these patients costs one-fourth of the Medicare budget. In their last six months of life, these patients go to the doctor's office 29 times on average. In their last month of life, half go to the emergency room. One-third wind up in the intensive care unit. One fifth undergo surgery.

Government Policy

Between 1960 and 1965, health care spending increased by an average of 8.9 percent a year. That's because health insurance expanded. As it covered more people, the demand for health care services rose. By 1965, households paid out-of-pocket for 44 percent of all medical expenses. Health insurance paid for 24 percent.

From 1966 to 1973, health care spending rose by an average of 11.9 percent a year. Medicare and Medicaid covered more people and allowed them to use more health care services. Medicaid allowed seniors citizens to move into expensive nursing home facilities. As demand increased, so did prices. Health care providers put more money into research. It created more innovative, but expensive, technologies.

Medicare helped create an overreliance on hospital care. Emergency room treatment is very expensive, making up one-third of all health care costs in America. By 2011, there were 136 million emergency room visits. An astonishing one out of five adults use the emergency room each year.

In 1971, President Nixon implemented wage-price controls to stop mild inflation. Controls on health care prices created higher demand. In 1973, Nixon authorized health maintenance organizations to cut costs. These prepaid plans restricted users to a particular medical group. The HMO ACT of 1973 provided millions of dollars in start up funding for HMOs. It also required employers to offer them when available.

In 1973, Nixon completely abandoned the gold standard. As the dollar's value plummeted, it unleashed double-digit inflation. Health care costs rose at the same rate.

From 1974 to 1982, health care prices rose by an average of 14.1 percent a year for three reasons. First, prices rebounded after the wage-price controls expired in 1974. Second, Congress enacted the Employee Retirement Income Security Act of 1974. It exempted corporations from state regulations and taxes if they self-insured. Companies took advantage of these lower-cost and flexible plans. Third, home health care took off, growing by 32.5 percent a year.

Between 1983 and 1992, health care costs rose by an average of 9.9 percent each year. Home health care prices increased by 18.3 percent per year. In 1986, Congress

passed the Emergency Medical Treatment and Labor Act. It forced hospitals to accept anyone who showed up at the emergency room. If the patient couldn't pay, Medicaid covered it. Prescription drug costs rose by 12.1 percent a year. One reason is that Congress allowed prescription drug companies to advertise on television.

Between 1993 and 2010, prices rose by an average of 6.4 percent a year. In the early 1990s, health insurance companies tried to control costs by spreading the use of HMOs once again. Congress then tried to control costs with the Balanced Budget Act in 1997. Instead, it forced many health care providers out of business. Because of this, Congress relented on payment restrictions in the Balanced Budget Refinement Act in 1999 and the Benefits Improvement and Protection Act of 2000. The Act also extended coverage to children through the Children's Health Insurance Program.

After 1998, people rebelled and demanded more choice in providers. As demand increased again, so did prices. Between 1997 and 2007, drug prices tripled, according to a study in Health Affairs.

One reason is that pharmaceutical companies invented new types of prescription drugs. They advertised straight to consumers and created additional demand. The number of drugs with sales that topped $1 billion increased to 52 in 2006 from six in 1997. The U.S. government approved expensive drugs even if they were not much better than existing remedies. Other developed countries were more cost-conscious.

In 2003, the Medicare Modernization Act added Medicare Part D to cover prescription drug coverage. It also changed the name of Medicare Part C to the Medicare Advantage program. The number of people using those plans tripled to 17.6 million by 2016. Those costs rose faster than the cost of Medicare itself.

The nation's reliance on the health insurance model increased administration costs. A 2003 study found that administration made up 30 percent of U.S. health care costs. It's twice the administrative costs in Canada. About half of that is due to the complexity of billing.

For example, U.S. private doctors' offices need seven people to do billing for every 10 physicians. A big reason is that there are so many types of payers. In addition to Medicare and Medicaid, there are thousands of different private insurers. Each has its own requirements, forms, and procedures. Hospitals and doctors must also chase down people who don't pay their portion of the bill. That doesn't happen in countries with universal health care.

The reliance on corporate private insurance created health care inequality. Those without insurance often couldn't afford visits to a primary care physician. By 2009, half of the people (46.3 percent) who used a hospital said they went because they had no other place to go for health care. The Emergency Medical Treatment and Active Labor

Act required hospitals to treat anyone who showed up in the emergency room. These uninsured patients cost hospitals a staggering $10 billion a year. The hospitals passed this cost along to Medicaid.

Preventable Chronic Diseases

The second cause of rising health care costs is an epidemic of preventable diseases. The four leading causes of death are heart disease, cancer, chronic obstructive pulmonary disorder, and stroke. Chronic health conditions cause most of them. They can either be prevented or would cost less to treat if caught in time. Risk factors for heart disease and strokes are poor nutrition and obesity. Smoking is a risk factor for lung cancer (the most common type) and COPD. Obesity is also a risk factor for the other common forms of cancer.

These diseases cost an extra $7,900 per person. That's five times more than the health care costs for a healthy person. The average cost of treating diabetes, for example, is $26,971 per family. These diseases are difficult to manage because patients get tired of taking the various medications. Those who cut back find themselves in the emergency room with heart attacks, strokes, and other complications. (Source: "The Impact of Chronic Diseases on Health Care," For a Healthier America, 2014.)

Recent research found that even Alzheimer's disease might be preventable. The study, called SPRINT MIND, found that high blood pressure could worsen dementia caused by Alzheimer's.

How the ACA Slowed the Rise of Health Care Costs

By 2009, rising health care costs were consuming the federal budget. Medicare and Medicaid cost $676 billion. That was 19 percent of the total budget of $3.5 trillion. Payroll taxes only cover half of Medicare and none of Medicaid. This so-called mandatory spending also included federal and veterans' pensions, welfare, and interest on the debt. It consumed 60 percent of the federal budget. Congress knew something had to be done to rein in these costs.

By 2020, retiring baby boomers will drive Medicare and Medicaid costs to 24 percent of the budget. As health care costs increase faster than economic growth, Medicare taxes and the Trust Fund will cover less and less. By 2030, the Trust Fund would be bankrupt, and taxes would only pay for 48 percent of the costs.

Federal health care costs are part of the mandatory budget. That means they must be paid. As a result, they are eating up funding that could have gone to discretionary budget items, such as defense, education, or rebuilding infrastructure.

Obamacare's goal is to reduce these costs. First, it required insurance companies to provide preventive care for free. That treats chronic conditions before they required expensive hospital emergency room treatments. It also reduced payments to Medicare Advantage insurers.

Since 2010, when the Affordable Care Act was signed, health care costs rose by 4.3 percent a year. It achieved its goal of lowering the growth rate of health care spending.

In 2010, the government predicted that Medicare costs would rise 20 percent in just five years. That's from $12,376 per beneficiary in 2014 to $14,913 by 2019. Instead, analysts were shocked to find out spending had dropped by $1,000 per person, to $11,328 by 2014. It happened due to four specific reasons:

1. The ACA reduced payments to Medicare Advantage providers. The providers' costs for administering Parts A and B were rising much faster than the government's costs. The providers' couldn't justify the higher prices. Instead, it appeared as though they were overcharging the government.
2. Medicare began rolling out accountable care organizations, bundled payments , and value-based payments. Spending on hospital care has stayed the same since 2011. Part of the reason for this is that hospital readmissions dropped by 150,000 a year in 2012 and 2013. That's one of the areas hospitals get penalized if they exceed standards. It resulted in increased efficiency and quality of patient care.

1. High-income earners paid more in Medicare payroll taxes and Part B and D premiums. For more, see Obamacare taxes.
2. In 2013, sequestration lowered Medicare payments by 2 percent to providers and plans.

Based on these new trends, Medicare spending was projected to grow just 5.3 percent a year between 2014 and 2024.

Six Healthcare Technologies Coming in the Next 10 Years

- Donna Marbury

February 2, 2019

- Technology, Automation, Connectivity, Data Analytics

Experts agree that forecasting the future of healthcare technology isn't difficult—machine learning, artificial intelligence (AI), cloud technologies that apply to clinical, workplace, and financial processes will have better and richer incorporation into the industry.

But to get there, healthcare executives need to be laying the cultural foundation today for upcoming technology changes in the next decade.

For example, investing in AI over the next five years could cost, on average, more than $30 million per organization, according to a survey of 500 healthcare executives by OptumIQ published in November 2018. However, 38% of employers and 20% of health plans believe they would see a return on that investment in four years or less. Ultimately, 94% of respondents see investments in technologies, such as AI, as the clearest route to affordable, accessible and equitable healthcare in the future.

Related article: Real-World Applications of Artificial Intelligence in Healthcare

But in order to realize those future possibilities, a culture shift needs to happen in healthcare today, says Tom Lawry, director of worldwide health for Microsoft. He adds that the future of healthcare technology relies more on the culture and framework being created by clinical and business leaders today.

"What really is going to be needed in the future is not just the breakthroughs in technology, but breakthroughs in creative thinking and the ability of leaders to think differently when redeveloping their processes to leverage the power of the technologies rather than trying to insert these new technologies into a framework," Lawry says.

Anil Jain, MD, vice president and chief information officer for Watson Health at IBM, says that healthcare organizations will need to shake the stigma of being bureaucratic and slow to adapt in order to be agile enough to adopt future technologies.

"Healthcare organizations need to start to push the agenda that says that innovation is important to healthcare. People outside of healthcare view the industry as very conservative, very slow to adapt," Jain says. But when you talk to people inside the industry, we all think we're moving very, very quickly. The key is for these healthcare organizations to get involved in the national debate, at the advocacy level and advising others on what the industry needs, so that movement is made collectively."

Although it is difficult to predict, these experts have given their insights on where healthcare technology will be the most impactful in the next decade:

1. Better cloud integration with existing technologies

Although devices collecting digital data are important to healthcare, how that data is shared is the most essential part of the equation, Lawry says.

Related article: Five healthcare technologies likely to be developed in the next 10 years

More than 90% of healthcare organizations are widely utilizing the cloud to host applications, according to a 2017 Healthcare Information and Management Systems Society (HIMSS) survey on cloud use. However, the industry is still using the cloud for separate functions, such as clinical apps, data hosting, and backup, and not in a holistic fashion. The HIMSS survey found that though there is a high level of cloud usage at healthcare organizations, the functionality is still limited.

Use of cloud integration has allowed for data from different healthcare silos to be shared, and as more organizations continue to connect those dots, Lawry says that it will transform the industry.

"Everyone's digitizing their data, whether that's electronic medical records or X-rays. But digitizing data doesn't do anything other than that. It changes data from one form to another instance," Lawry says. "The transformation that's brought about by the cloud and bringing that data together, allows for all kinds of interesting things. That to us is the number one transformational aspect going forward for the next few years."

2. Deeper AI infusion

Artificial intelligence has been a part of the healthcare for years, but experts believe in the next decade it will be a regular part of the industry.

A survey of 200 healthcare professionals by Intel Corporation, released in July 2018, found that 37% of respondents were using AI in limited ways, and 54% believe that there will be widespread AI adoption in the next five years.

John Doyle, director of business strategy for Worldwide Health Industry at Microsoft, says that moving forward we should expect to see AI infused into all aspects of clinical and operational workflow.

"We are early in the journey for cloud and AI adoption today, but we are already starting see some amazing progress being made and we expect this continue and with a broader adoption of applied AI in areas such as the clinical interpretation of complex datasets, intelligent medical images, voice integration, and real-time insight of streaming medical devices and sensors data," Doyle says.

As a new generation of consumer-focused services aim to merge patients and consumer journeys, applied AI will disrupt how patients engage with healthcare providers today, Doyle says.

Related article: How Health Systems are Using AI and Future Predictions

"Applied AI has the potential to reduce the complexity of how healthcare data is captured and analyzed, examples of this include how intelligent voice integration and bot technologies are being used during virtual consultations to reduce the time spent entering data by both patients and clinicians, and how pre-trained clinical knowledge can be applied at the point of care," Doyle says.

3. Infrastructure upgrades that make healthcare more accessible

The ability for clinicians to meet with patients via web and mobile portals is essential for chronic care management, says Rhonda Collins, DNP, RN, chief nursing officer at Vocera, and founder of the American Nurse Project.

"A majority of this country is still rural. So, we need to rely on technology to fill gaps in human connections in healthcare—telehealth will be more important going forward, as infrastructure and technology continue to improve. Hospitals and clinics will need to prepare for a world that technology is making smaller," Collins says.

A 2017 report issued by the Federal Communications Commission found that 50% of U.S. counties house people who both have high occurrences of chronic diseases and a greater need for broadband connectivity. The commissioned coined this, "double burden," and incidents can be as high as 60% in rural counties.

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"That makes a remote consultation with a doctor or video chat very difficult, but the situation is improving, and over time, I think at-home, remote care will be most valuable in rural areas, where technology use is far more practical than a long drive to see a doctor," Collins says.

As telehealth expansion continues through Medicare reimbursements, patients are still unclear about its availability and use. A survey released by Healthline in August 2018 found that 46% of Medicare Advantage members were unsure if telehealth was an option, and 37% stated telehealth was not offered, even though it is.

Collins adds that hospitals are still lacking full-scale Wi-Fi and consistent cellular service, which impedes integration of telehealth and other mobile health offerings.

"These basic issues make it very difficult to bring technology in to provide extraordinary care and connectivity to all patients everywhere. Infrastructure upgrades are a must, and that should be the focus of many hospitals, so they can leverage great technologies that improve the lives of patients and clinicians alike," Collins says.

4. Smarter therapies

Though smartphones, smart watches and other smart devices are being used by consumers, a focus on "smart" hasn't translated to healthcare solutions, says Kal Patel,

MD, MBA, president of BrightInsight, a Flex company that provides biopharma and medical technology internet platforms.

"By and large, many healthcare solutions lack meaning. They are not smart," Patel says. "The data from them is either not collected at all or it is collected, and it stays in some type of local environment which inherently limits the value you can derive from that."

Patel says that in the next decade drug delivery devices such as insulin pens, biologic auto injectors, inhalers, and smart packaging for pills will be commonplace to enhance both clinical and business operations in healthcare. The goal of tracking this data is to add to the landscape of behavioral insights that can help enhance patient care. Patel says that the ability to observe how patients use chronic therapies both inside clinical settings and at home or inpatient care settings is enhanced by integrated cloud and artificial intelligence use.

"Most of that technology is already there, so in the next five to 10 years it's about unlocking that data. Once you can unlock that data, we will really be able to see progress using artificial intelligence and machine learning within those data sets," Patel says.

Jain says that IBM Watson is currently studying concepts around prescribing digital therapies that can be powered by blockchain and artificial intelligence and be tailored to patients' behavior.

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"Wouldn't it be really interesting if I prescribed an anti-diabetes tablet, and I'm also prescribing an app on the patient's smartphone that makes sure that they stay somewhat adhering to the medication? If they have any side effects, they're educated about when they should see the doctor or when they could just simply ignore them," Jain says.

He says smarter therapies could also prescribe diets that work in conjunction with medications and give patients more feedback on their progress.

"The idea is that we have to go beyond the pill," Jain says. "As a physician, there has to be a better way to virtually have eyes on the patient even when they're not in my exam room four times a year for 15 minutes."

5. Enhanced personalized medical care

In the next decade, clinicians will have the ability to use blockchain, machine learning, and artificial intelligence seamlessly to provide specialized care to patients, says Jain.

"The biggest thing is going to be our ability to use these advanced technology enablers to get much better at doing personalized medicine and personalized healthcare with our patients," Jain says. "Because the back-end healthcare technology is crunching all of their clinical data and administrative data, looking at their genomic profile, looking at their social determines of health much faster than any human physician or clinician could, and combining that information in a trusted way."

Jain says that fitness trackers are currently collecting siloed data, but are an important part of the equation when the data can be integrated along with other health determinants. Ultimately, he says more personalized treatments, especially for chronic conditions, would increase adherence to care plans.

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"Essentially a clinician will have the ability to say, instead of just practicing in an evidence-based way, we're going to combine evidence and personalized choices to give patients a much higher likelihood of being successful at the first set of treatments that are offered, instead of going back and forth a few times trying to figure things out," Jain says.

6. Workflow that mimics consumer technology

Collins says she is hopeful that the workflow technology that the healthcare field adopts over the next 10 year will match and adapt to technology that people are used to in other areas of their lives.

"Before a hospital shift, someone can sit in their cars and buy movie tickets, make dinner reservations, and chat with friends—all from their smartphones. They then enter the hospital for a day's work, and many times, the technology landscape is entirely different," Collins says.

She fears that the antiquated processes and devices in healthcare workplaces will be a deterrent to tech-savvy millennials.

"When millennials go to work at a hospital, we are asking doctors, nurses and care teams to step back 20 years and use landline phones, fax machines, pagers, and overhead calls—all of which downgrade and add complexity to our millennial workforce. They carry a heavy burden every day working with patients in stressful hospital environments, and the very basic technology they're using only adds to the stress," Collins says. "Furthermore, we are adding to cognitive loads by forcing them to remember procedures and how to use outdated technologies they are not naturally accustomed to using. So, over time, antiquated technology that doesn't mirror what is used in our personal life and is not secure will be eliminated. As younger people continue to enter the workforce, many hospitals will be forced to modernize."