

The Education & Training for Health Care Transformation Conference



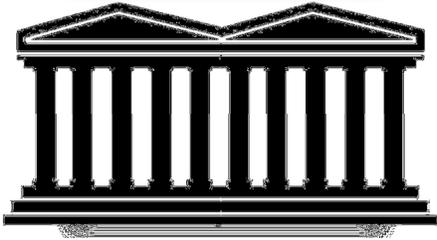
**The Ten Pillars Shaping the Future of Health Science Education:
External Forces, Ongoing Evolution and Future Trends**

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The challenge of developing some thoughts framing the future of education and training in the health sciences and on the critical relationship to the delivery of tomorrow's healthcare in the United States and globally is surely significant. Many have done so, much has been proposed, yet it has never been more relevant and time sensitive than it is today. I am truly honored to have an opportunity to share thoughts based upon the foundations of much experience and a strong desire to help to vision the pillars for future excellence and sustainability in the education & training for the ongoing transformation of health care.

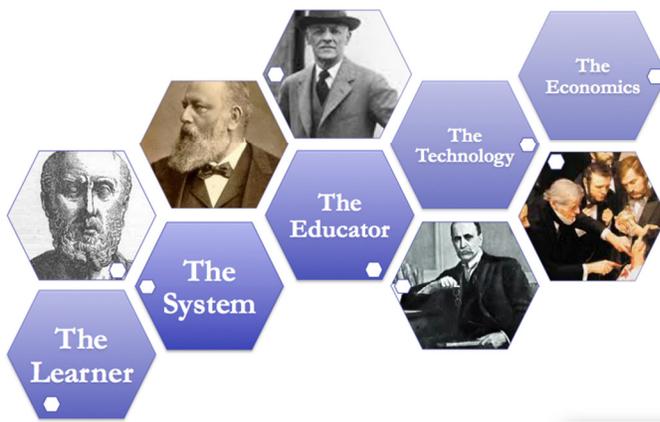
Now, more than a hundred years since the time of Abraham Flexner, we have a unique opportunity to look critically at the structure of the educational processes that form the knowledge, skills, as



well as the attitudes and behaviors, indeed, the core values, of the next generations of healthcare professionals in the United States. The healthcare educational programs in the United States in Medicine, Nursing, Pharmacy, and the Allied Health professions, have been widely recognized as among the finest in the world. However, the challenges that we now face with an aging population requiring more healthcare, multiple and increasingly severe workforce shortages, and a rapidly escalating cost base

in the setting of more advanced treatments and diagnostics is formidable. It is in this regard that an attempt at truly seeing the future, the “La Clairvoyance” is in order.

The external forces that these educational programs face fall into at least five separate domains. First, and probably most important of the ongoing and changing needs of the learners, the way



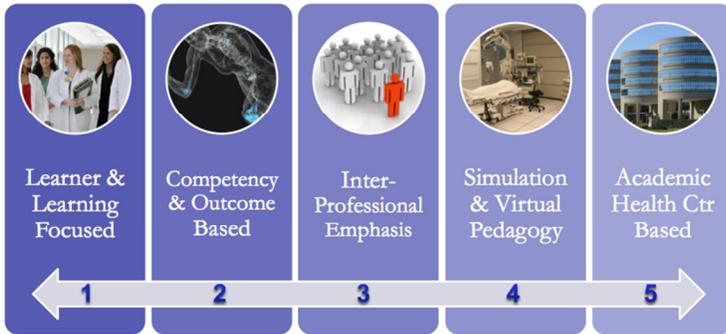
students learn today and the way they effectively retain information, as well as have access to instantaneous facts, is dramatically different than that of even twenty years ago, let alone in the days of Abraham Flexner. Therefore, it is no longer a question of whether an individual

can retain or access facts, but how they use them, evaluate them and apply them to the day-to-day challenges of the healthcare of individuals and of their communities. The changes in our healthcare delivery systems are also been quite complex in that we no longer deliver care as individual providers as much as we do in integrated practice groups, healthcare systems and across interprofessional teams.

The educators themselves are also quite different than they were over the last century in that with a wealth of information to impart, we spend far more time teaching nuances of clinical decision making and how to integrate and evaluate information as well as the bedside skills of application. The need to focus on the content and format of interprofessional education as well as the relative paucity of interprofessional curriculum. The workforce shortages of the team of health profession

educators, who will shape the next generation of healthcare professionals, is also a great challenge. Grooming the educators is an extremely important part of our future focus. There is rapidly advancing technology, not only at the bedside, in the operating room and in the clinic, but also in the classroom and in small group and reflective learning sessions. Traditional curriculum and pedagogy is rapidly being replaced, or at least supplemented, by advanced two-dimensional and rapidly becoming three-dimensional imaging and communication technologies. The environment of classroom-based education where there is not only mentorship from faculty, but camaraderie of fellow students directly abuts against the high technology interface of smart phone learning and virtual immersive reality learning environments. Optimizing that interface is a critical component of visioning the future of our educational programs and ongoing career development. Finally, the economics of these educational programs has shifted such that we continue to stress the nearly inelastic limits of the costs of attendance and the amount of student debt that is currently being incurred by those pursuing undergraduate and graduate degrees in the health sciences. The relentless increase in not only tuition and fees, but the cost of technology and access to student borrowing, has created a critical imbalance given the lifelong earning capabilities and the escalating costs of traditional healthcare professional instruction. Given the classroom, laboratory and technology platforms that are necessary for state-of-the-art learning for our current and future students, a way of managing the educational costs and delivering them in a way that does not preselect applicants, but allows our graduates to have productive and fulfilling careers without the unwelcomed burden of immeasurable debt is an important and highly critical goal.

There are ten pillars, ten structural elements, upon which the future of education in the health sciences will likely be built and with which the global megatrends that are shaping our future will hopefully be managed. What follows is a very brief description of these ten structural elements.



The first of these pillars is that our curriculum, pedagogy, tools of assessment as well as the overall structures will become increasingly learner and learning focused. Many

historical trends have been focused around traditional educational environments, the needs of faculty and classroom/laboratory instruction. A better understanding of the learning needs of the current and future generation of students as well as the neurophysiology of retention and application of this knowledge and skill sets will become a critical pillar of our future educational programs. Self-paced learning that is individualized to the student's learning style will hopefully become the norm and not the exception.

The second pillar will be the use of competency and outcome based assessment strategies that will not link the educational programs to time of study, but will link them to their individual competencies and to the outcomes of their learning. The ability to perform in the domains of knowledge and skill, as well as professionalism and communication, will be increasingly measured on an individual basis and the chronological passage through the curriculum will be adjusted accordingly. Just as individuals learn at rather different paces the best ways to swing a golf club or acquire a foreign language, others learn the health professions at different paces as well.

The third pillar will be based upon a solid component of interprofessional education leading to team-based collaborative care. The days of individual healthcare professionals functioning alone without an interdependence on their well-run team and the health care system are diminishing. The educational programs, while adjusting, will need to embrace the interprofessional needs will have to work out complex logistics of scheduling, assessment, pedagogy and curriculum in order to be sure that a genuine respect for the interprofessional learners and the understanding of the collaborative nature of healthcare is emphasized across all aspects of undergraduate and graduate curriculum. Not to under estimate the importance of individual professional standards, but to blend the interprofessional competencies and to establish a common set of goals around professionalism, communication and other aspects of the curriculum.

The fourth pillar will undoubtedly relate to the use of increasing amounts of simulation and virtual immersive reality in the learning environment. These widely discussed, but currently minimally applied, educational techniques will use not only mechanical and high technology simulation, but will continue to rely on simulated patients as well as three-dimensional immersive virtual reality for the education of the next generation of healthcare professionals. The use of smart phones, I-spaces, CAD-caves as well as technical and didactic problem solving in simulated environments will enhance the safety of healthcare, create an ongoing basis for team participation and create learning environments that are far less challenging than the “see one, do one, teach one” methodology that has been around for decades.

The fifth pillar is the basis of the use of our current and future academic health centers as learning environments around which our interprofessional students and collaborative care teams develop. The use of outreach community-based sites, as well as the myriad of outpatient settings, will of course enhance the educational experience. However, the ongoing health professional workforce production at the academic health centers combined with the educational and clinical research that is being conducted will continue to form an important pillar and touchstone for all of the health professions. The academic health centers will continue to be the “safety net” for healthcare delivery and health care education in our country and around the world. Not only for those patients who will self-refer, but for those who are referred by other health systems and other healthcare professionals for whom local or regional services have either been unable to reach diagnoses or solutions, or for those in which attempts have been unsuccessful. This is indeed one of the finest roles for the academic health centers in our country and will continue to be strengthened as a pillar of the future educational systems. The academic health centers of the United States and around the world will continue to be the economic drivers, not only from an educational and research perspective and those that deliver high quality complex clinical care, but also as a major employer in their regions and as an innovator for intellectual property that will ultimately form the next generation of pharmaceuticals, medical devices and technology that will be used for personalized healthcare, early diagnosis screening and more effective treatments.



The sixth pillar will be based upon the sequential and highly interlocked alignment of the establishment of knowledge, skill and professionalism

competencies. The passage from a pre-professional program through the professional program into the ongoing specialization and ultimately practice, currently is relatively fragmented and not highly aligned. In the instance of the medical profession, the pre-medical competencies are individualized and not tightly connected to those acquired in medical school. The interrelationship in the competency-based education to the next generation of graduate medical education and ultimately into lifelong learning is also fragmented and heavily siloed. The establishment of a common set of competencies, a singular vocabulary and a learning portfolio-like environment where these competencies can be aligned and stored will clearly be an important part of the future. It will markedly enhance the ability of an individual or a specialty to make changes in their competency requirements and to keep track of their ongoing educational performances.

The seventh pillar is based upon team care, in which performance will be assessed. While independent performance of any healthcare professional or of their specialty will likely continue to be taught and assessed, it will be the ability of a team to perform care to prevent complications of diseases to continue to focus on not only individual, but population-based care and to responsibly manage the access and cost, will be increasingly part of the assessment of all healthcare professionals not only during their educational intervals, but well into their careers, as the costs and logistics become increasingly complex. The development of systems to assess team based care and systems to align compensation models will become increasingly important.

The eighth pillar is the critically important accountability for the quality and safety of the outcome of the educational programs and the lifelong practice patient and community outcomes of healthcare professionals. Book learning, and indeed even skill performance in real or simulated patient

settings, will no longer be the only basis of competency progression through the educational programs and into their careers. Indeed, the quality of the care delivered, patient satisfaction and the overall safety of the environment created will become increasingly important measurements for which the educational systems and the individual products of those educational systems will be held accountable. Hospital readmissions, hospital-acquired infections, as well as the appropriate and judicious use of healthcare resources will become increasingly important outcome based milestones of progression and measurements of continued competency.

The ninth pillar of the future of health science education will be the intensified focus on the diversity of the healthcare workforce, as well as the global responsibilities and interactions. We have been long aware that the global needs of the healthcare system are very disparate and directly impact upon the care in any part of the United States. With the rapid transmission of disease and the diverse increase in medical knowledge and technology, we cannot safely rely on individual, regional or even national programs without reaching out to our global roots. As the workforce becomes increasingly diverse across the myriad of the components defining diversity, we will enhance the quality of the care that we deliver in the United States and around the world and become better providers as we truly understand the needs of the patients and the communities that we serve.

The tenth and last structural pillar relates to the economics and more broadly, the sustainability of the delivery systems and the educational systems that are intimately interlocked. The cost of health education is increasingly high because of the intense need for faculty, laboratories and technology as well as the ever escalating advising, counseling, regulatory and accreditation components of the

systems. The cost to the students both contained within the average cost of attendance during their preprofessional and professional education, as well as the amount of debt that health professional students are currently incurring, is clearly a problem and will need to be managed by stabilizing the costs and increasing the value connecting the ongoing costs to lifelong learning and indeed to lifelong competency is one way of enhancing the value proposition. Similarly, the educational programs will need to increasingly focus on the economics and sustainability of the healthcare delivery system as we currently know it on a national level, but also on a regional and local level. The responsibility of the healthcare providers and in particular, the healthcare team leaders, for not only insuring the quality and safety of the healthcare delivery, but for also focusing on the economic sustainability on a community base, but also on an individual level, will become an increasingly important competency for all of our educational systems across the healthcare professions. While simple solutions are not immediately available, the clear recognition that quality safe care is also the most economic way to deliver care, has widely permeated the educational environment and clinical care arena. The hand-in-hand relationships that need to be built among and between the health professions, but also the large healthcare delivery systems and academic medicine and the tightly integrated industries, will further enhance the safety and quality and produce the only alignment possible to result in economic sustainability of the delivery system.



The ten pillars that have been discussed above form just the beginning of the elements for a vision for the future. It is in the hand of the skilled, experienced and visionary artist that the future will be seen. The only way to truly predict this future is to create it, and to

create it together. The question is not one of the feasibility of change, for those who fear change will certainly markedly dislike the concept of becoming irrelevant. The challenges are how to best engage the dialogue in a highly time sensitive manner and to make the highly logical, yet in some ways complex decisions, on how these barriers are best broken and how the ten pillars can be most successfully joined into an enduring structure. Agreement around a common set of pillars will markedly facilitate this progress.

Again, I am honored to participate in this dialogue and look forward to the opportunity to continue to do in the future.

Dr. Jeffrey Gold is the Chancellor and Executive Vice President of Health Affairs and the Dean of the College of Medicine at the University of Toledo. After more than 20 years of practicing cardiac and thoracic surgery in the New York metropolitan area, he joined the University of Toledo in 2005 and has served in this role overseeing the educational programs, research programs as well as the clinical programs of the University since that time. A graduate of the Engineering School of Cornell and the Medical School of Cornell University, Dr. Gold did his surgical training at the New York Presbyterian Medical Center and Memorial Sloan Kettering Cancer Center in New York. He then went on to complete fellowships in adult and pediatric cardiothoracic surgery at the Brigham and Women's Hospital in Boston and at the Children's Hospital of Boston before returning to the New York Presbyterian Health System and Cornell to become the Chief of the Division of Pediatric Cardiothoracic Surgery. Following the decade as Department Chair at the Albert Einstein College of Medicine in New York, Dr. Gold joined the University of Toledo team.

In addition to his Ohio responsibilities, Dr. Gold has served on numerous Boards of Trustees and currently is the Co-Chair of the Liaison Committee on Medical Education, the accrediting body for all allopathic medical schools in the United States and Canada, serves as the Chair-Elect of the Council on Medical Education of the House of Delegates of the American Medical Association, on the Board of Directors of the Accreditation Council on Graduate Medical Education, as well as having served on numerous editorial boards, think tanks and other organizations. He is the author of several hundred peer-reviewed publications, numerous books, chapters and over 100 invited lectureships in the areas of health education, science, healthcare reform policy development and economic innovation.

