External Environmental Scan
2012 Strategic Planning Initiative

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*Let us not be content to wait and see what will happen, but give us the determination to make the right things happen.*

-Peter Marshall
Introduction and Overview

Environmental scanning is a process of discovery. It is the internal communication of external information that may potentially influence an organization’s decision-making process.

In preparing this environmental scan the authors looked for clues about how the world is changing by examining the literature, reviewing the work of futurists, reviewing recent reports of the Institute of Medicine, the Carnegie Foundation and the Department of Health and Human Services, following leads and recommendation that were provided by university colleagues, and by following an endless trail of web links that took us down a rabbit hole of enlightenment. Finding information was not a problem. Limiting information became the real challenge. The information provided in the following pages is meant to be representative of trends and not comprehensive. There was no attempt to examine opportunities and challenges facing each of our nine colleges; believing instead that the colleges are in a much better position to examine their environment and draw their own discipline-specific conclusions. References to “medicine” or “medical education” should be considered in the broader context. We focused on the fact that we are a health professions university with a shared interest in quality education, health care delivery, factors affecting the health care workforce, the future role of technology in our professional lives, and research. These five areas were chosen for the focus of our work.

Education

Global Health

It is important for future health care providers to be knowledgeable regarding global health. Global health is defined as “the study and practice of improving health and health equity for all people worldwide through international and interdisciplinary collaboration.”

An established definition of what should be included in curricula for medical students on global health does not currently exist. The authors list several competencies that were discovered: understanding of the global burden of disease; travel medicine; healthcare disparities between countries; immigrant health; primary care within diverse cultural settings; skills to better interface with different populations, cultures and healthcare systems; develop a sense of social responsibility; appreciate contrasts in healthcare delivery systems and expectations; humanism; scientific and societal consequences of global change; evolving global governance issues; cost of global environmental change; taking adequate patient histories and physical examinations in resource poor settings; and cost-consciousness, using physical diagnosis without high technological support. It is recommended that schools begin this process by deciding on which competencies to address followed by determining which educational approaches are appropriate to achieve this training.
In order to address global health, the University of California is in the planning stages of “creating a unique transdisciplinary, multicampus academic global health model” (p. 499). This model would generate collaboration between those in the health sciences with others “from nonhealth sciences, such as agriculture, business, economics, engineering, law, etc.” (p. 500). The purpose is to research global health issues, find solutions and implement those solutions accordingly. Due to strategic planning discussions, it was “concluded that major universities have to have global reach if they are to be competitive in the twenty-first century” (p. 500).

- An emerging trend observed is the increasing interest expressed by students for educational programs relating to global health.
  - The UC system offers a Master’s degree in global health education. Requirements to fulfill this degree include 30 units of coursework and a completed thesis.


**Opening Campuses in Other Countries**

There is a trend in higher education where schools are increasingly opening campuses in other countries. For example UC Berkeley is opening a “large teaching and research center in Shanghai.” Duke, Stanford, New York University and Yale also plan to open campuses in China. Carnegie Mellon University is looking to open a campus in Rwanda. Some are opposed to these plans as they may affect “American academic values” in countries that may represent “oppressive governance, human-rights violations, and curtailment of academic freedom.” Others argue that as we become more globalized and educational institutions are more collaborative, a balance of educational values can be reached.

Space Considerations for Health Care Education

Space planning for the university should be focused on institutional learning objectives. This includes redesigning existing space as well as constructing a new building. The “four domains of technology” need to be considered in this process: infrastructure, data management, support services, and adaptability (p. 4). Since educational and technological needs are continually changing, future needs must be taken into consideration to allow accommodations to be made. It is recommended to bring together “stakeholders by having them brainstorm ideas and concepts around learning spaces that fall into these categories: educational trends versus health science education trends, economic climate, political factors, technology factors, customer needs, and uncertainties or unknowns” (p. 6).

Educators and facilities personnel need to be consulted in this process as well and good communication among all parties will benefit all in this process since many factors to consider are dependent upon one another. An example given is the addition of recording equipment requested by faculty. To fulfill this request, IT personnel will need to purchase and store a new server and those involved in security matters will need to make arrangements to limit access to this costly equipment. Other recommendations include:

- Conducting observations to gain an understanding of the use of current space.
- Interviewing users of the space such as faculty and students
- Taking photos of areas can give a good perspective
- Document uses of the space with considerations of the academic calendar
- Some vendors will lend equipment for temporary use to justify purchasing
- Conduct site visits
- Effects of implementation of new technology could include “additional staffing if needed, appropriate increases in the general supplies budget, as well as a dedicated ‘replacement cycle’ budget for equipment” (p. 11).


Donations

Donations given to colleges and universities decreased significantly in 2009, according to the annual Voluntary Support of Education Survey. The current economic environment is the primary reason given for this decline, which includes donations made by alumni. Donations increased just 0.5 percent in 2010. Colleges and universities are looking to increase alumni donations as a way to increase funding. One method for achieving this goal is to develop ways “to make alumni feel a part of the university” which will improve their dedication to their schools and possibly increase donations.

**Reform in Medical Education**

*Educating Physicians: Health Care Delivery*
*Carnegie Foundation for Advancement of Teaching*
*Educating Physicians: A Call for Reform of Medical School and Residency*
June, 2010

"The huge increases in medical knowledge, technology and specialization in recent decades have interacted with a now near-chaotic system of health care delivery, magnifying the challenges facing medical education," the authors write. "There is a need to motivate continuous learning and improvement across the whole arc of medical training. Those who teach medical students and residents must choose whether to continue in the direction established over a hundred years ago or take a fundamentally different course, guided by contemporary innovation and new understanding about how people learn."

They write that a new vision is needed to drive medical education to the next level of excellence. "The future demands new approaches to shaping the minds, hands and hearts of physicians." And they call for a much-needed dialogue to strengthen medical education and ultimately, provide better patient care.

Fundamental change in medical education will require new curricula, new pedagogies and new forms of assessment. Among the authors’ recommendations are:

- To standardize learning outcomes and assess competencies over time. A focus on learning outcomes and milestones could end the time-based structure of medical school and residency.

- To strengthen connections between formal and experiential knowledge across the continuum of medical education, specifically by incorporating more clinical experiences earlier in medical school and providing more opportunities for knowledge-building later in medical school and throughout residency.

- To promote learners' ability to work collaboratively with other health professionals, such as medical assistants, nurses, pharmacists, physical therapists and social workers.

- To support learners' responsibilities for quality of care, team performance and their own learning while providing skilled supervision.
• To make professional formation an explicit area of focus in medical education through strategies such as formal instruction in ethics and reflective practice, exploration of the role of the physician-citizen and establishment of more supportive learning environments.

• To cultivate a spirit of inquiry and improvement in learners and in health care teams; this spirit supports both innovations in daily practice that translate into better service to patients, system improvements and improved patient outcomes as well as the development of larger research agendas, new discoveries, and knowledge building.

• To be more intentional about our selection, development and support of teachers and medical educators.

The authors note that in order for medical schools to innovate, the funders, regulators and professional organizations that control and influence medical education must be actively engaged. New policies will be required.

The study’s seven policy recommendations are that:

1. The Association of American Medical Colleges (AAMC) and medical schools work together to revise pre-medical course requirements and admission processes, ensuring the diversity of those in medical schools.

2. Accrediting, certifying, and licensing bodies together develop a coherent framework for the continuum of medical education and establish effective mechanisms to coordinate standards and resolve jurisdictional conflicts.

3. CEOs of teaching hospitals and directors of residency programs align patient care and clinical education to improve both and develop educational programs that are consistent with practice requirements.

4. Deans of medical schools and CEOs of teaching hospitals support the teaching mission of the faculty by providing financial support, mentoring, faculty development, recognition and academic advancement.

5. Deans of medical schools and CEOs of teaching hospitals collaboratively make funding for medical education transparent, fair and aligned with the missions of both medical schools and teaching hospitals.

6. AAMC, American Medical Association (AMA), Accreditation Council for Graduate Medical Education (ACGME), medical specialty societies, and medical schools advocate for sustained private, federal and state funding commitments to support infrastructure, innovation and research in medical education. Medical education is a public good that should be supported by society.
7. AAMC, AMA, ACGME, medical specialty societies, and medical schools collaborate on the development of a medical workforce policy for the United States. A variety of interventions addressing the cost of medical education, length of training, and practice viability ensure that the country has the mix of specialty and subspecialty physicians to meet the needs of the population.

Molly Cooke; David M. Irby; Bridget C. O'Brien


**Getting Credit for Informal Learning**

*Mind Shift*

*How we learn*

December 23, 2011 | 9:31 AM | By Audrey Watters

*Will Informal Learning Carry the Same Weight as College Degrees?*

The article describes the use of digital learning badges. These badges are meant to showcase and recognize all kinds of skills and competencies — the kind of subject matter expertise that college degrees are meant to indicate, for example — as well as “soft skills” that aren’t so easily apparent based on traditional forms of credentialing.

When the Mozilla Foundation announced the Open Badges Project, in conjunction with the MacArthur Foundation and HASTAC, “Badges for Lifelong Learning” was the theme of this year’s [Digital Media and Learning Competition](http://mindshift.kqed.org/2011/12/will-digital-badges-carry-the-same-weight-as-college-degrees/), an annual contest that supports research of how digital technologies are changing the way we learn and work. On stage at the formal unveiling of the Open Badges Project were representatives from not just Mozilla and the MacArthur Foundation, but from the Departments of Education, Labor and Veterans Affairs, from NASA as well as from other businesses.


**The Scholarship of Teaching**

*Scholarship in Teaching: An Imperative for the 21st Century*

Ruth-Marie E. Fincher, MD, Deborah E. Simpson, PhD, Stewart P. Mennin, PhD,
Gary C. Rosenfeld, PhD, Arthur Rothman, EdD, Martha Cole McGrew, MD, Penelope A. Hansen, PhD, Paul E. Mazmanian, PhD, and Jeffrey M. Turnbull, MD

Academic Medicine, Vol. 75, 9/Sept.2000
At some medical schools broader definitions of scholarship have emerged along with corresponding changes in their academic reward systems. Such situations are not common, however. The definition of scholarship generally applied by medical schools is unnecessarily narrow and excludes areas of legitimate academic activity and productivity that are vital to the fulfillment of the school’s educational mission. The authors maintain that creative teaching with effectiveness that is rigorously substantiated, educational leadership with results that are demonstrable and broadly felt, and educational methods that advance learners’ knowledge are consistent with the traditional definition of scholarship. Faculty whose educational activities fulfill the criteria above are scholars and must be recognized by promotion.

The authors specifically address scholarship in education, focusing on teaching and other learning-related activities rather than on educational research, which may be assessed and rewarded using the same forms of evidence as basic science or clinical research. They build on Boyer’s work, which provides a vocabulary for discussing the assumptions and values that underlie the roles of faculty as academicians. Next, they apply Glassick et al.’s criteria for judging scholarly work to faculty members’ educational activities to establish a basis for recognition and reward consistent with those given for other forms of scholarship. Finally, the authors outline the organizational infrastructure needed to support scholars in education.

[Note: This older article continues to have relevance in health professions education. Promotion criteria needs to recognize the importance of education in addition to being aligned with the mission of the university and academic unit]


[http://journals.lww.com/academicmedicine/Fulltext/2000/09000/Scholarship_in_Teaching_An_Imperative_for_the.9.aspx](http://journals.lww.com/academicmedicine/Fulltext/2000/09000/Scholarship_in_Teaching_An_Imperative_for_the.9.aspx)

*Technology in Education*

*5 Higher Ed Tech Trends for 2012*

As the New Year begins, education technology experts look at what's ahead for learners and educators.

By D.A. Barber

01/09/12

Washington, DC-based [Gilfus Education Group](http://www.gilfuseducation.com) has released its annual list of the top five trends in education innovation for 2012, which included three focused on higher education technologies:

- Prestigious institutions will launch online experiences designed to be as unique as those available to students on campus. Considerable investments are being made to enhance the student online learning experience.
• "Dynamic and flexible learning experience engines" will emerge to replace learning management systems. These products are adapting to the learner and returning with new content based on analysis of student performance.

• Tablets will surge as a means of delivering courses and e-learning media. E-books are more than digital representations of books since they can include video, 3-dimensional visualizations, web-links, dynamic charts, and embedded assessments.

Another trend is open educational resources. The state of California is considering a bill that would promote the use of online textbooks for the state’s 3 million college students. The bill would target the 50 most commonly used books for required lower-division courses. The resources would fall under a Creative Commons license, which means they will be open to reuse and customization.

The Massachusetts Institute of Technology through its MIT OpenCourseWare is a web-based publication of virtually all MIT course content including lecture notes, exams and videos, which are readily available to the world at no cost (no registration required).
http://ocw.mit.edu/about/

Campuses Move to the Cloud - With so many resources and learning opportunities moving online, and pressed by the need to reduce IT infrastructure costs, more and more campuses will take advantage of the benefits provided by cloud technologies. The way many college and university budgets work they can’t depreciate the equipment fast enough before it becomes obsolete. Schools are getting out of the hardware and technology stack business, focusing on content, and putting as much in the cloud as possible.


Educating the Net Generation (Oblinger and Oblinger) www.educause.edu/tgn

Campuses that make strategic investments in physical plant, technical infrastructures and professional development along the dimensions suggested will gain a considerable competitive advantage in both recruiting top students and teaching them effectively.

1. Encourage students to get involved in all curriculum committees at different colleges to enhance and improve syllabi as well as information delivery and to decrease the gap between faculties and students.
2. Hire IT personnel in each college to establish a unit for servicing staff, faculty and students.
3. Increase faculty understanding of teaching and learning power of technology.
4. Increasing the use of technology will increase demands for technological tools to be effectively integrated into the curriculum to enhance student learning.
5. Tools need to be developed to help faculty integrate technology into the curriculum.
6. Invest in physical and technological infrastructure like for example, wireless everywhere, multipurpose habitats and mirroring through experiments with virtual environments.

Net generation have high expectation for faculty members technology knowledge and skill (Gregory R. Roberts-Chapter 3 P.3.3)

Faculty should encourage interaction both within and outside the classroom. Group work should be emphasized alongside required one-on-one meetings with professors. Students should be given the opportunity to interact with faculty and researchers outside the confine of the curriculum and to develop meaningful relationship with them (Carie Windham. p. 5.7).

- Offer on line courses; Professors must find ways to offer a method of exploration and research within curriculum.
- Development of intentional learners who are empowered through intellectual and practical skills; informed by knowledge and ways of knowing; and responsible actions and civic values (Alma Clayton and Nancy O’Neil, p. 9.3).
- Faculty need to increase their capabilities of using the new technologies through:
  - Co-design: developing learning experiences students can personalize
  - Co-instruction: using knowledge sharing among students as a major source of content pedagogy
  - Guided social constructivist and situated learning pedagogies: infusing case-based participatory simulation into presentational /assimilative instruction
  - Assessment beyond tests and papers: evaluating collaborative, nonlinear, associational webs of presentations; using peer-developed and peer-rated forms of assessment; employing student assessment to provide formative feedback on faculty effectiveness
  - Offering a recurring four-year cycle of faculty development workshops
  - Linking professional development to replacing faculty computers every four years
  - Supporting course development initiatives.

*Faculty Development*
This article discusses research faculty development and their value to educational institutions. The principles of faculty development and lessons learned from this article can be applied much more broadly to help ensure the success of junior faculty who have expectations for scholarship related to promotion and/or tenure. “The faculty is an institution’s greatest resource”. It is for this reason that institutions must invest heavily in faculty development. Faculty development could be elevated to a central office (possibly dean-level office) that would be responsible for development, coordination, implementation and oversight of programs aimed at enhancing the success of faculty research and/or scholarship. Suggestions for enhancement activities may include: 1) faculty development seminars; 2) topic-focused workshops; 3) development or enhancement of web-based resources; and 4) faculty mentoring.


Greg Roberts-Chapter 3. Technology and Learning Experience of Net generation
Ben McNeely- Chapter 4. Using Technology as a learning Tool, Not Just the Cool new Thing.

Carie Windham. Chapter 5. Educating the Net generation.

Chris Dede –Chapter 15 Planning for Neomillennial learning Styles: Implications for Investments in Technology and Faculty.

Anne H. Moore, John F. Moore, and Shelli B. Fowler- Chapter 11. Faculty Development for the Net generation.

Malcolm Brown-Chapter 12. Learning Spaces.
Health Care

Health Care costs exceed 17% of the US GDP and continue to rise. At this rate, health care will destroy the US economy. We have 21st century technology delivered in 19th century organizational structures. Stakeholders are concerned with a number of disparate issues. Employers are very concerned about the ‘cost of poor health’ and the patient cares about their condition, not the provider’s specialty. ‘Value’ is the only issue that aligns everyone’s interests. Value in health care is defined as outcomes divided by the cost of delivering the care to achieve those outcomes. Outcomes are multidimensional and should be organized around the patient’s problem over the total care cycle, not simply at each episode of care. To manage value, outcomes need to be measured at the patient level.

Providers have an almost complete lack of understanding of how much it costs to deliver patient care. Thus they lack the knowledge necessary to improve resource utilization, reduce delays, and eliminate the activities that don’t improve outcomes. As providers and payers better understand costs, they will be positioned to ‘bend the cost curve’ within the system and not based on top-down mandates.

The opportunities exist to reduce health care costs without sacrificing outcomes.

Primary Care

Primary care is ‘Mission: Impossible’ if it tries to be all things to all people. Instead, primary care providers need to think of ‘buckets of patients’ with different needs and reorganize around these buckets. Increasing prevalence of chronic diseases and multiple co-morbid conditions in adults and children is producing many more patients with complex clinical needs. Developing strategies that redesign primary care to increase practice-level support for complex patients may represent improved PCP recruitment and retention. In chronic diseases such as diabetes, for example, poor glycemic control is a strong independent predictor of complexity beyond a diagnosis of diabetes, which suggests that elevated HbA1c levels reflect a complex interplay among disease severity, medical treatment, and patient self-management behaviors.

Measuring complexity is more challenging than many stakeholders might anticipate. A clearer understanding of the attributes that contribute to complexity may help in redesigning the health care system to meet the needs of our population.

The passage of the Patient Protection and Affordable Care Act could bring an additional 32 million currently uninsured Americans into the primary care system at a time when primary care is in crisis. Fewer medical school graduates enter primary care and many PCPs leave clinical practice due to decreased job satisfaction. In PCP surveys, higher overall patient complexity has been associated with decreased job satisfaction.

Integrated Practice Units
In 1962, coronary care units became the first integrated practice units (IPUs). Reorganizing units around a medical condition to standardize protocols and treatment processes, improve information systems, and measure the resource capacity cost through time-driven activity-based costing, has been successful in several notable centers in the US and Europe. These centers from the Schon Klinik in Germany to the Cleveland Clinic have successfully changed their culture to embrace a new paradigm: ‘measurable...tangible...better’.

These centers pursue a culture of learning by comparing ‘ourselves to ourselves’ and dealing directly with the patient, since they recognize that the patient, not the doctor, is the only customer. This new culture has translated into long-term patient loyalty and sustained growth.

Large employers, not unlike WesternU, are health care payers for their employees. It is essential that employers identify what’s driving their costs and then develop a strategic framework that understands the unmet health needs of employees, offers a portfolio of programs, and redefines health at work; redefining with innovation, not checklists.

The Cleveland Clinic recognized that every one of their employees is a caregiver. Outcomes drive learning and measuring the experience of care is as important as the other outcomes in calculating the value equation. Patients first!...transparency...improvement are core values there.

You can’t have a ‘brand’ without a strategy.

Recognizing they “can’t be the best at everything,” in 2007 the Clinic redesigned themselves into institutes focused on conditions. Neuroscience was first. Each was charged with defining diseases and conditions it would care for, developing a set of shared outcome measures for which the team would be jointly accountable, and identifying skills needed to be brought together for the sets of conditions the team will treat. Institutes were given autonomy to pursue different implementation approaches and were expected to share insights. Institute websites were created so others at the Clinic can learn and decide whether or not to use a similar approach.

Since institute physicians generate revenues together, rather than as individuals, traditional differences in compensation would not necessarily persist. Changing the culture required changes in medical education and it would take five years for the new culture to get established.

By 2009, the Clinic institutes covered the main campus. Their core purpose of measuring outcomes is to enable learning and quality improvement by the teams, not obtaining referrals, marketing, or impacting ratings. Measure costing based on time and activity, not charges and reimbursement.

_The Chronic Care Model as applied to Diabetes Care_

A major barrier to optimal care is a delivery system that too often is fragmented, lacks clinical information capabilities, often duplicates services and is poorly designed for the coordinated
delivery of chronic care. The Chronic Care Model has been shown in numerous studies to be an effective framework for improving the quality of diabetes care. The Model includes six core elements: 1) a delivery system design that is proactive rather than reactive where planned visits are coordinated through a team-based approach; 2) self-management support; 3) decision support (evidence-based guidelines, effective care guidelines); 4) clinical information systems using registries that provide patient-specific and population-based team support; 5) community resources and policies to support healthy lifestyles; and 6) health systems to create quality-oriented culture.

Fundamental to the successful implementation of the Model is the redefinition of the clinic staff roles and the promotion of patient self-management. Collaborative, multidisciplinary teams are best suited to provide such care for people with diabetes and to facilitate patients’ performance of appropriate self-management.

The 2012 American Diabetes Association Position Statement on Standards of Medical Care in Diabetes recommends four goals. First, care should be aligned with components of the Chronic Care Model to ensure productive interactions between a prepared proactive practice team and an informed activated patient. Second, systems should support team-based care, community involvement, patient registries, and embedded decision support tools to meet patient needs. Third, decisions should be timely and based on evidence-based guidelines that are tailored to individual patient preferences, prognoses, and co-morbidities. Fourth, a patient-centered communication style should be employed that incorporates patient preferences, assesses literacy and numeracy, and addresses cultural barriers to care.

Three specific objectives and practical strategies were outlined by the 2012 Position Statement. One, to optimize provider and team behavior, strategies include, setting explicit goals with patients; identifying and addressing language, numeracy, and cultural barriers to care; integrate clinical information tools into the process of care; and incorporate care management teams including nurses, pharmacists, and other providers. Two, support patient behavior change through high-quality diabetes self-management education and support, including emotional concerns. Three, making an institutional priority to provide high quality care through changes in the system of care. Strategies for change include expanding the role of teams and staff; redesigning the processes of care; implementing electronic health record tools; activating and educating patients; identifying and engaging community resources and public policy that supports healthy lifestyles.

It Takes a Village and Storytelling to Combat Diabetes

There was no word for diabetes in traditional Native American languages when the Europeans arrived on this continent. The Indian Health Service reported a single case in the entire state of Arizona in 1933. Today, diabetes is more than twice as prevalent in American Indian/Alaska Native adults. The Indian Health Service reports that 16% of their adult patients and more than
33% of American Indian adults in the US Southwest have diabetes. Native Americans are twice as likely to die from diabetes than are Caucasians.

Native American individuals and communities often feel indirectly blamed by the media for poor decision-making. Journalists have depicted people in those communities as being responsible for their diabetes because of eating habits, sedentary lifestyles, and obesity. Many suffering with diabetes have developed a fatalistic view of their disease. From a historical perspective, many Native Americans may be affected by a “soul wound” spanning lifespans and generations inflicted through events such as smallpox, forced relocation, land loss, forced abortions, and mass murders. Diabetes is often framed in communities as the final genocide.

To address this “historical trauma”, tribal leaders and health care practitioners can use holistic, cultural, social and spiritual approaches to supplement, not replace, current treatment protocols. The Indian Health Service, tribal, and urban Indian health programs are implementing innovative strategies to prevent and treat diabetes, including community-based programs and culturally appropriate solutions.

**Applying a Value Framework within a Delivery System**

According to Thomas H. Lee, MD, Professor of Medicine, Harvard Medical School, and Network President, Partners Healthcare System, CEO, Partners Community HealthCare, Inc., which qualified as first ACO on January 1, 2012, systems need to ask themselves, “what are we trying to do?” The need is to commit to improvement in value and forget about ‘profitability’. Develop ‘value report cards’ with outcomes divided by cost. If you are not improving, you are declining.

Bohmer outlines four “habits” of high-value health as a way to improve health care delivery:

1. specification and planning;
2. infrastructure design;
3. measurement and oversight; and
4. self-study.

**Primary Care That Works for All**

The Institute for Alternative Futures provided four scenarios for primary care in 2025 based on three assumptions (zones) regarding an uncertain future. Zone 1 is a “zone of conventional expectation” reflecting the extrapolation of known trends; the expectable future. Zone 2 is a “zone of growing desperation”, which presents a set a plausible challenges an organization may face, a challenging future. Zone 3 is a “zone of high aspiration”, in which a critical mass of stakeholders pursues visionary strategies and achieves surprising success.
For our purpose we will consider the optimistic “zone of high aspiration” and describe Primary Care That Works for All. In this scenario primary care in the United States is reshaped by a series of policy and delivery system measures that focused on value and equity. The most significant of these measures was the aggressive expansion of the Patient-Centered Medical Home Model as a means to improve collaboration among providers and to reduce cost. Scenario highlights include:

- Policymakers in the United States actively pursue the “Triple Aim” in health care initiatives. 1) enhancing patients’ experience of care; 2) reducing per capita health care costs; and 3) improving population health.

- The patient-centered medical home evolves into community-centered health home that focuses on the individual and the community and that effectively leverages the social determinants of health at the community and neighborhood levels.

- Primary care teams expand to include social workers and community health workers.

- Advanced knowledge technologies and community mapping allow for identification and remediation of ‘hot spots’ of ill health.

- Payment systems use sophisticated statistical methods and apply the decision principle, ‘if it’s smart, we’ll pay for it.’ Most payments to health care providers are capitated payments with additional rewards for improved health outcomes.

[Note: This is but one of four possible scenarios described in this report]

http://www.altfutures.org/primarycare2025

**Interprofessional Collaborative Practice**

Government budget constraints and employer cost-shifting to employees will place increasing downward pressure on health care reimbursement. Narrowing margins demand greater efficiency in health care delivery, including health professionals practicing at or near the full extent of their training. This, in turn, requires that care be delivered in multi-professional/interprofessional settings where the type, scope, and extent of care needed can be matched to a health professional or team of health professionals with sufficient and appropriate expertise.

Aging populations with chronic conditions and multiple co-morbidities are consuming an increasing proportion of total health care expenditures. Effective care management for those with multiple chronic conditions and those needing behavioral health services demands effective interprofessional care coordination. There is emerging evidence that interprofessional teams achieve better outcomes treating a variety of conditions. Additional evidence suggests
that reducing errors and improving quality requires effective interprofessional collaboration. Health systems can no longer afford to absorb the adverse human resource costs of poor interprofessional collaboration and its consequences. To remain cost competitive, to improve quality and effectiveness in anticipation of value-based reimbursement systems, and to address the evolving health care needs of a demographically dynamic patient population, academic health centers and the health care system generally must make interprofessional collaborative practice a fundamental characteristic of how they organize and deliver care.

Until recently, there has been no consensus definition of core competencies for interprofessional collaborative practice to serve as the foundation for interprofessional education and training programs. The release in May 2011 of an expert panel report on core competencies for interprofessional collaborative practice provided the missing platform for the design and implementation of more focused and consistent educational outcomes for health professions education. The expert panel report was developed under the auspices of the Interprofessional Education Collaborative, with representatives from ADEA, AACOM, AAMC, AACP, ASPH, and AACN. Core competencies were identified within four domains: Ethics and Values, Roles and Responsibilities, Interprofessional Communication, and Teams and Teamwork.

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Workforce

This memo is an executive summary of the current and future capacity of the CA health care workforce with consideration of expected increase in demand resulting from expanded insurance coverage under the Patient Protection and Affordable Care Act (ACA).

Current Market Drivers of Change

- Demographic factors include a population that is projected to grow 15% in the next 20 years, an increasingly culturally diverse and aging population, and an increase in chronic disease burden.

- Market forces are also bringing about change. New models of care such as retail clinics and school- and work-based clinics are emerging to offer enhanced access to health care.

- Affordable Care Act, which will in part expand coverage to four to six million more Californians.

- There are over a million individuals in California’s health care workforce.

- Geographic maldistribution of health care professionals has resulted in shortages in some areas of the state, and surpluses in others.

- The health professions overall are not reflective of the state’s ethnic and racial diversity.

- California has numerous health professions education programs, but many are oversubscribed.

- Practice models are changing in response to new pressures and opportunities.

- California population = 37,266,000; active physicians = 95,198 (includes MD & DO), ratio of physicians to 100,000 population = 255 (ranks 20). Primary care physicians = 33,822, ratio of primary care physicians to 100,000 population = 90 (ranks 26). In the Inland Empire the ratio of primary care physicians to 100,000 population = 40.

- Oregon population = 3,855,500; active physicians = 10,594, ratio of physicians to 100,000 population = 274 (ranks 12). Primary care physicians = 3,976, ratio of primary care physicians to 100,000 population = 103 (ranks 11).

- Students enrolled in medical or osteopathic schools: Total California students = 6,460, 17.3 per 100,000 (ranks 41). Total Oregon students = 516, 13.4 per 100,000 (ranks 45).

Current and Future Demand:
While shortages exist, distribution poses a bigger challenge. California’s health care workers are not distributed appropriately throughout the state, leading to access problems for primary and high demand specialty care in many areas.

Only five percent of California’s MDs and eight percent of its nurses are Latino compared to 37 percent of the population.

It is clear that primary care will be the area most impacted by demographic and policy changes as preventive care and chronic disease management become increasingly important under the ACA.

**Educational Alignment with Emerging Need**

- California needs more primary care providers, and yet the state has fewer family medicine residency slots available today than it had ten years ago.

- Some of this decrease has been offset by growth in NP, PA and DO programs and graduates of those programs choosing primary care.

- Racial and cultural disparities between patients and the health care workforce continue.

- Health care delivery will increasingly depend on teams from multiple professions. Having students from multiple disciplines learn with, from and about each other through team-based Interprofessional education programs will improve team-based care, patient satisfaction and health care outcomes.

- Health care institutions need to work with colleges and universities to transform traditional curricula to 1) meet the requirements of new and evolving work models, and 2) to provide the critical thinking skills necessary to work with the increasingly sophisticated technology of contemporary medical care.

**Policy Solutions**

- There are development opportunities offered in the ACA.

- New practice and financing models, including patient-centered medical homes and accountable care organizations, look to teams of providers where doctors, nurses, medical assistants, and many others might play key roles in providing care.

- To provide care with a smaller workforce, health systems will need to increase involvement of patients and families in the care process, including home and community-based services.

- Because professionals tend to practice where they train, increasing training and residency opportunities in under-represented fields and communities is a good investment.
• Expand loan repayment programs for practicing in underserved areas and for high-need professions.

• Enhance telehealth to improve communications between clinicians, particularly in remote areas.

• Strengthen the capacity of safety net providers who serve under-represented patient populations.

• Expand the legal scopes of practice for professions such as nurse practitioners, physician assistants, and others.

• State practice acts should be based on demonstrated initial and continuing competence. This process must allow and expect different professions to share overlapping scopes of practice. Pathways should be explored to allow all professionals to provide service to the full extent of their current knowledge, training, experience and skills.

• Invest in training and health information technology that would allow the safe delegation of tasks to clinical support staff in team-based models.

• Develop financing models that mitigate income differences between primary and specialist providers and that reward patient outcomes-based services by teams of providers.

• Improve, standardize, and streamline workforce data collection and availability to enhance regional and statewide planning.

• Promote ongoing statewide and regional partnerships for health workforce planning. Adequate responses to changes in demand can only be met through coordinated planning efforts beyond the level of individual organizations or communities.

• Hospitals need to develop new work models that increase efficiency, workforce satisfaction, and patient outcomes. Proven process improvement strategies developed outside of health care may expedite efforts to improve performance.

• To accommodate preferences of the multiple generations in our workforce, hospitals, educational institutions and others need to replace traditional human resource policies (largely developed with baby boomers in mind) with policies and programs that include greater flexibility and choice.

**Educational Considerations**

• Increasing the number of primary care physicians is an important but long-term goal that cannot be achieved fast enough to meet the upcoming increase in demand.
However, investing in strategies to encourage medical students to practice in primary care is an important step.

- Refocus some education resources on professions such as nurse practitioner and physician assistant, which require less training time than medical school and could help meet some of the more immediate demand for primary care providers.

- Ongoing reductions in support for public education will negatively impact access to health care education in the state’s community colleges, CSU and UC systems.

- Promoting and supporting innovations in California’s community colleges to increase completion of health professions programs and enhance retention of historically under-represented students would also help increase diversity and meet workforce demands. WesternU may want to increase collaboration with community colleges.

*Increase Diversity*

- Investing in interpretation, including training existing providers to work better with interpreters and interpretation services; training existing bilingual clinical support staff such as medical assistants to serve as dual-role interpreters; and improving reimbursement and reward for practices utilizing interpretation services.

- Training for positions such as community health worker, promotoria, and health educator that can 1) facilitate links between clinical care delivery and population health and 2) reach out to California’s diverse communities to assist them in navigating the system, inform them of opportunities under the ACA, and support interest in health careers.

- Building career ladders that allow members of California’s diverse allied health professions to move up will improve their careers, help their communities, and help diversify the health care workforce.

- Evaluating and replicating models that work to enroll members from under-represented communities in health professions programs.

- Including communities of color in the policy and planning processes for ACA implementation.

*Source:* California’s Health Care Workforce – Are we ready for the ACA?  

Other workforce related links –

For the OSHPD Health Workforce Data Clearinghouse link:  http://www.oshpd.ca.gov/HWDD/HWC/
For maps of Healthcare educational programs offered in California:  http://www.oshpd.ca.gov/hwdd/Post_Secondary_Education.html

Technology

Future Technology and its Effect on Clinicians and Patients

- The increased use of new technologies will require clinicians to stay current on these technologies and be flexible in their practice.

- Insurance companies may not support coverage of new technologies unless there is concrete evidence of their effectiveness; clinicians should be supporters of coverage for these new technologies.

- “Advances in medical technology will continue at a rapid pace and will be one of the major drivers of the health care system.”

- Technology will allow clinicians to increase services to patients such as remote care for chronically ill patients and the ability to conduct specific tests on patients in-house without the need for testing in a hospital setting.

- Increased use of technologies such as genetic testing will bring increased concerns for “ethical, legal and social implications.”

Online Searching for Health Care Information

- 55% of internet users have searched for health care information for themselves, a family member or someone else they know; 29% search once a week; 30% search once a month

- More women (63%) search for medical information than do men (46%)

- People between the ages of 30-64 conduct the most searches for health care information

- 91% of those searching for medical information are covered by health insurance

- Factors such as race and economic status was not an indicator of searching for health care information

- 41% of searchers “say that the material they found during their last online search affected their decisions about whether they should go to the doctor, how to treat an illness, or how to question their physician”

- Most important reasons for searching online were convenience, anonymity and the large amount of information available online
Educause conducted a survey to find what “issues of strategic importance [were most relevant] to technology leaders in higher education.”

- In this economy it becomes difficult to achieve the funding levels that IT departments require. IT departments are now meeting with leaders in the campus community to create priorities to focus funding expenditures.

- IT administration should be involved in “local, national, and global information security communities and resources.” The campus community should receive training to increase awareness of security concerns and information technology.

- There is a growing trend toward including IT professionals in instructional technology decisions affecting instruction and learning assessment. Increased responsibilities of being more involved with instruction create “an environment of growing information fluency, bringing libraries, IT organizations, and academic units to a common ground where they assist students to effectively find, evaluate, and use information and to take active roles in the learning process” (p. 52).

- Disaster Recovery/Business Continuity plans are necessary to keep essential campus functions operational during a crisis that is organized and communicated. Elements considered include assigning responsibilities, funding, communication instructions, backup and recovery sites, and working with other organizations.

- Identity and access management, allowing the correct amount of access to information continues to be an important role for IT professionals. These include portals and learning management systems. The authors explain that “outsourced, hosted and cloud computing solutions present new I/AM challenges” (p. 52).

- It is advantageous for IT professionals to maintain adaptability and responsiveness to the rapidly changing technology environment that “not only impact traditional IT support models but also challenge deeply rooted institutional policies, business processes, and operational practices” (p. 56).

Technology and Minorities

There are trends that have emerged concerning the use of technology of minority groups, including the use of the internet, “broadband adoption,” social networking sites and mobile devices.

**Trend #1:** The internet and broadband populations have become more diverse over the last decade, although key disparities do remain. Statistics for internet use has increased overall for minorities and better represents the demographics that exist.

- “Foreign-born and Spanish-dominant Latinos” are less likely use the internet or have home access to the internet than whites or English-speaking Latinos. Therefore, “language proficiency” has a large influence.

**Trend #2:** Access to the digital world is increasingly being untethered from the desktop, and this is especially true for people of color.

- “Both blacks and English-speaking Latinos are more likely to own a mobile phone than whites.”

- The author explains that minorities use more features of their cell phones than whites in the following ways:
  - Text messaging
  - Use of social networking sites
  - Use the internet
  - Record and watch videos
  - Make a charitable donation via text message
  - Use email
  - Play games
  - Listen to music
  - Use instant messaging
  - Post multimedia content online
Trend # 3: Minority internet users don’t just use the social web at higher rates, their attitudes towards these tools differ as well.

- Blacks and English-speaking Latinos are more active on social networking sites such as Twitter and are more favorable of the government using this method for reaching populations than whites.


Technology and Advances in Patient Care

“The health care system has quickly adopted new medical technologies, both devices and pharmaceuticals. Despite increased interest in cost-benefit assessment techniques, the pace of introducing new technologies is unlikely to slow, and there will be a significant increase in the number of new technologies available in the coming decade. Some of the most interesting new technologies include:

- Rational drug design—the use of computers to design drugs that target a particular receptor
- Advances in imaging—the use of new imaging technologies, such as electron-beam computed tomography (CT), harmonic ultrasound, high-resolution positron emission tomography (PET) and functional magnetic resonance imaging (MRI), to look at the form and function of organs that were once examined only in surgery
- Genetic mapping and testing—the identification and testing of genes and genetic interactions that cause disease
- Gene therapy—the use of site-specific genes to treat a variety of inherited or acquired diseases
- Vaccines—the use of vaccines to bolster immune systems, target tumors or immunize against viruses, and of delivery methods including oral and nasal sprays to simplify the vaccination process
- Artificial blood—the use of recombinant hemoglobin, using E. coli, to create a blood substitute
- Xenotransplantation—the transplantation of tissues and organs from animals into humans, primarily bone marrow and solid organs
Minimally invasive surgery—the use of miniaturized devices, digitized imaging, and vascular catheters in neurosurgery, cardiology and interventional radiology

“Anticipating changes in orthopedics, Stryker Chairman John Brown predicts that joints and joint surfaces replaced and regrown using biotech products (e.g., bone morphogenic proteins) will replace mechanical implants.”

“Telemedicine has been slow to catch on. However, an aging population, decreasing equipment costs, and rapidly evolving computer and telecommunications technology make its future widespread use more promising. Studies have found that remote monitoring of ICU patients by intensivists can be medically and economically effective. Telemedicine also is being used in disease management programs for congestive heart failure and diabetes.”

“The success of organ and tissue transplantation continues, as evidenced by the improvement in long-term survival rates and the increased number of organs being transplanted.”

“Experimentation in robotics medicine and remote operations is becoming more widespread and could have implications for delivery of care, licensure, professional liability and payment. Telerounding using robots to complement formal postoperative care has been shown to augment patient satisfaction.”

“Nanotechnology has the potential of having a dramatic impact on the practice of medicine. It will enable clinical research using microelectronic mechanical systems (MEMS) or “labs on chips” concepts. Nanotechnology may be used to track the course of disease in people at home, under natural conditions, in order to monitor the effect of interventions and see what perturbations are critical to success or failure.”


Technology and the Security of Health Information

This article discusses the use of technology in the health care setting and how its use can improve care. The increased use of technology allows health care providers to manipulate patient records and share them effortlessly. These benefits also bring increased concerns about the safety of these records with regard to HIPAA regulations. The author comments, “the health care sector’s overall shift to information digitization may prove to be one of the greatest challenges to privacy, confidentiality, and security.”

Research

Genomics

Initial sequencing of the human genome took 13 years and $2.7 billion to complete. Today a consumer can have her entire genome sequenced in a matter of days for less than $10,000. Next generation sequencing technology will drive cost down to something comparable to a diagnostic imaging test such as a CT scan.

Patients enter the health care system to answer three questions: What is wrong with me? What caused it? and, What can I do about it? Genomics has the potential to shorten the diagnostic odyssey and direct therapeutic intervention. Genomic testing is moving from a single assay to test a single hypothesis, which is both expensive and time consuming, to a high-throughput assay capable of answering all of those questions. A major problem is that genomic analysis generates much more data than any clinician or patient can use. Clinicians are trained only to order the tests they need. What happens when a “panic” value is reported for something unrelated to the initial question? As more tests are performed the likelihood of a false positive increases. Should clinicians be trained as geneticists? Systems will need to be in place to protect sensitive patient information and allow patient control over who has access.

What are the necessary skill sets required for analyzing, interpreting, and using genomic information? Education and training should focus on competencies, not knowledge. Importance should be placed on what clinicians are able to do, not necessarily what they know. Much of the accumulated knowledge concerning health care will be embedded into point-of-care decision analysis tools associated with electronic health records. When pharmacogenomic testing is routine, clinicians will not order pharmacogenetic tests and wait for the results to decide on drug and dosage. Instead an electronic prescribing system will search a database, find a patient’s results and recommend the proper drug and dosage.

The role of genomics in population health is yet to be defined. Knowing there is a risk of acquiring a disease, as in the case of type 2 diabetes and other common diseases, may not be enough to change behavior, particularly because the degree of risk cannot be predicted from genomic tests along. It will require the maintenance of large curated databases in order to bring population-based genomic medicine to fruition. Unlike laboratory tests, genomic findings are enduring and they can be useful throughout a person’s life.

Stem Cell Research

Stem cells hold great promise for advances in medicine. They can be used to regenerate a range of damaged tissues, treat a variety of medical conditions, and assist in the development of new drugs. Those involved in stem cell research are keenly aware of the challenges and opportunities with each of the three main kinds of stem cells: adult (somatic), embryonic, and induced pluripotent (IPS) cells. Stem cells are undifferentiated cells that have the capacity to
self-renew and differentiate into more than one specialized cell type. It is because of stem cells that one’s body is able to grow, develop, and repair itself.

Medical advances in this field depend on our ability to isolate, cultivate, and manipulate stem cells. Advances also depend on understanding the interaction between derived cells and those being affected. For example, mesenchymal stem cells (a form of adult stem cell) derived from blood, bone, fat and the umbilical cord can readily differentiate into connective tissue. When injected, they are known to “home” to injured tissue where they can assist repair. This affect is not by replacing damaged cells, but indirectly; through paracrine effects (hormones synthesized in one cell affects adjacent cells). Mesenchymal stem cells secrete factors that reduce inflammation, suppress the host’s immune response, and perhaps stimulate stem cells already present in injured tissues. Understanding how to harness the paracrine effects of infused stem cells holds great promise for regenerative medicine.

Stem cell treatment requires a sufficient quantity of cultured cells. A current problem with culturing adult stem cells is that cultured cells in vitro can exhibit genomic instability. They also have a limited capacity to proliferate outside of the body. Research into improved methods of cultivating stem cells will certainly address these limitations.

Embryonic stem cell overcome the chief obstacle of adult stem cells in that they are pluripotent and can be maintained in culture and self-renew indefinitely. Embryonic stems cells can be differentiated into a wide variety of cell types including hepatocytes, neurons, retinal cells, blood cells, pancreatic cells and cardiomyocytes, etc. An exciting area of biomedical research is to model the effects of a range of factors on embryonic development to identify those that predispose to disease later in life.

Cells can be obtained from a patient with almost any disease, reprogrammed to a pluripotent state, cultured in vitro, and differentiated into a cell type that can express features of the disease. Such disease models “in a dish” can be used to test new drugs and gene therapies.

When a new drug is developed it must undergo extensive preclinical evaluation. Embryonic stem cell lines offer an unlimited supply of normal tissue such as heart, neural or liver cells for routine early testing of new drugs for toxicity.

Excitement for the future of stem cell research and therapy is well founded. It holds the promise for tissue regeneration, treatment for degenerative diseases, and as an aid in the understanding the origins of disease. A major challenge with the advancement of stem cell therapies will be to avoid transfusing undifferentiated cells that carry the potential for gene mutations, cellular dysfunction, and tumorigenesis.

*Translational Research*

The pace of discovery in the life sciences is breathtaking. Our understanding of human genetics, the physical and chemical interactions of single molecules within cells, and the
promise of tissue regeneration through stem cells has grown exponentially. Yet, there have been painfully few equivalent advances in human health. The challenge is to turn the intellectual riches that flow from biomedical discovery into practical riches from which humanity can benefit.

Translational science addresses the challenge of bringing discovery from “bench to bedside”. Science has made tremendous progress in identifying the molecular causes of disease - discoveries that have revealed hundreds of potential new therapeutic targets. However, therapies exist for just 200 of the more than 4,000 conditions with defined molecular causes. The problem is that the translational pipeline is full of bottlenecks that slow the process and add expense. Currently it takes about 15 years from molecular discovery to new therapy.

In a new scenario, imagine that a researcher enters seamlessly into a team that is ready for translation. The team features experts in all aspects of clinical research, including medicine, pharmacology, toxicology, intellectual property, manufacturing, clinical trial design and regulation. The basic researcher is now part of a team that has the necessary tools and infrastructure to move from discovery to a therapy or technique that benefits society.

The NIH has recently launched the National Center for Advancing Translational Sciences (NCATS). This new entity will strive to reengineer the process of developing drugs, diagnostics, and devices. The NCATS will require partnerships from academia, industry, patient advocacy groups, regulatory agencies, and philanthropies to break the bottlenecks that currently exist. NCATS will seek to generate innovative methods and technologies that will enhance the development, testing and implementation of diagnostics and therapeutics. Those who can offer components of translational science will likely be early funding targets, such as:

- therapeutic target validation
- chemistry
- virtual drug design
- preclinical toxicology
- biomarkers
- efficacy testing
- phase zero clinical trials (exposure of small numbers of patients, for limited time, at minimal nontherapeutic doses)
- rescuing and repurposing (investigating new uses for approved and abandon compounds)
- clinical trial design
- post marketing research

Challenges exist with the new translational paradigm. Team members must be adequately rewarded in terms of pay and promotion just as richly as if they were individually funded and had produced a string of publications. Cost sharing in a collaborative translational research
environment can pose many problems that must be addressed. Despite the challenges, anything is better than the current situation in which an individual’s publications trump real societal need.

**Research Readiness**

- Pharmaceutical companies are looking to decentralize basic science research and partner with academia.

- Contract research organizations (CROs) and pharmaceutical companies are looking for looking for efficient and productive partners, particularly at academic health centers.

- Creating a university portal for industry research collaboration could streamline decision-making process, increase capacity, and improve access. Providing a forum for industry pipeline presentations to faculty researchers would stimulate discussions regarding potential areas of collaboration.

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