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The “New Physics” of Patient Care

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There are many disruptive forces impacting academic health centers [alphabetically]

- Business sector
- Changing market forces
- Consumer empowerment
- Disease patterns
- Globalization
- Pace of change
- Politics and policies
- Population demographics
- Science
- Societal needs and values
- Technology



What's *different* this time?

- **1. Business sector**
- **2. Changing market forces**
- Consumer empowerment
- Disease patterns
- Globalization
- Pace of change
- Politics and policies
- Population demographics
- **3. Science**
- Societal needs and values
- **4. Technology**



1. Business sector

- Trillion-plus dollar spend on healthcare opens up enormous opportunities
- Catalyzed by tremendous entrepreneurial growth in niche areas
- Has the potential to bypass the hegemony of academic health centers in some areas

Some examples

- Ambulatory Care
 - Retail Clinics – now over 1900 and growing. CVS, Walgreens, Kroger, and Target have clinics in only 8% of their 20,000 stores
 - Urgent Care Centers – about 6400 with annual growth rate of 300-600 per year

Convenient Ambulatory Care – Promise, Pitfalls, and Policy. Chang JE, Brundage SM, Chokshi DA, N Engl J Med 2015;373:382-388/July 23, 2015



Other examples

- Diagnostic and other testing
 - 23andme
 - ANYLABTESTNOW
- Wearables
 - Fitbit
 - Pebble Time
 - Apple Watch
 - Jawbone Up2



2. Changing market forces

- Wave of consolidation in healthcare
 - Forcing partnerships among willing (and unwilling) entities
 - Large capital formation with local, regional and national market power
 - Academic health centers largely regional in scope



3. Science

- We are entering a new era in medical discovery that will focus on precision medicine
- This changes the paradigm for care delivery, drug discovery, and virtually everything else

4. Technology

- Has fostered the enormous empowerment of healthcare consumers
- Changes fundamentally the nature of the “guild”
- IBM Watson is an current example

Let's not discount other forces as well

- Disease patterns
- Globalization
- Pace of change
- Politics and policies
- Population demographics
- Societal needs and values



The forces at play in 21st century healthcare are in effect creating a “new physics” of patient care

- These forces are creating a perfect storm for the transformation of our enterprise

The new “physics” of patient care

$$E = mc^4$$



$$E = mc^4$$

The Emerging model of healthcare^a, where:

- m = the population, both individually and collectively
- c⁴ =
 - c¹ = care anywhere
 - c² = care in teams
 - c³ = care by large data sets
 - c⁴ = care by machines

a. Inspired by Eric Dishman's Ted Talk at http://www.ted.com/talks/eric_dishman_health_care_should_be_a_team_sport.htm.

Care anywhere (c¹)

- Technology is moving with and inside the patient's body, wherever the patient may be
- Large, fixed infrastructures are necessary, but could be configured differently
- Consumers want convenience and one-stop shopping



Care in teams (c²)

- The sacrosanct one-to-one doctor patient relationship is being replaced by relationships with multiple health professionals
- Figuring out how to gain the most value from team care is key
- Reimbursement must be supportive
- Scope of practice needs careful re-design



Care in large data sets (c³)

- Collections of huge meta-data sets are becoming standard for patients, eventually leading to continuous monitoring
- A new interpretive and functional infrastructure is required to manage this data
- Locus of decision-making is shifting



Care by machines (c⁴)

- Machines can out-perform humans in many tasks (surgery, data storage and recall)
 - They don't have to be perfect, but just make less mistakes than humans
- Machines' abilities don't decline with age
 - They can be updated
- They are “HR friendly”
- Machines don't get tired
- Machines are a real threat to conventional medical practice



What does the “new physics” mean for academic health centers?

- Patients are gaining increasing power and more choices
- Health systems are consolidating to gain provider power
- Workforce projections are difficult, if not impossible
- The private sector, technology, and political forces have the potential to “bypass” the academic health center hegemony on education, research and patient care

Academic health centers need to increase their relevance



How do academic health centers stand today?

A unique hybrid of business and academics

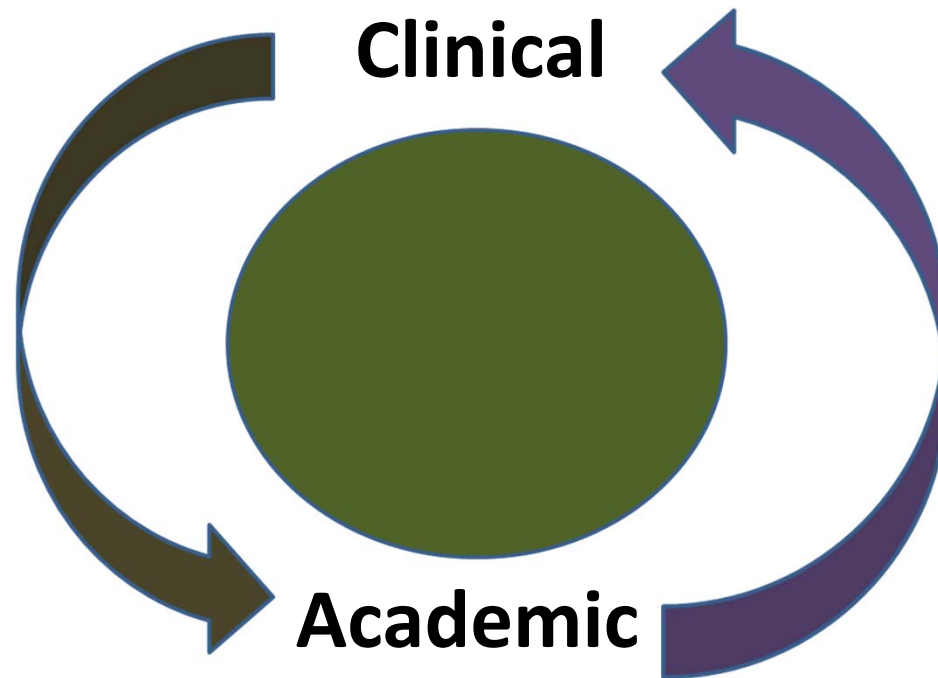


Their key strength

- The ability to *align* academics (education and research) with the care of patients in order to achieve the “virtuous cycle”

The “Virtuous Cycle”

The clinical and academic missions support each other and make each other better



No other health-related entity has this unique capacity

- But can this unique property provide a path to future success?

Some vulnerabilities to overcome

- High reliance on clinical margins to support the missions because:
 - Education is *not* profitable
 - Research is *not* profitable
- Efficiency is hard to measure in many mission areas, so solutions are sometimes elusive
- Leadership conflicts abound in many institutions, which compromise the ability to achieve the virtuous cycle



The new environment

The current and coming environment is forcing changes in the ways universities, hospitals, health systems and research institutes operate:

- Making internal inefficiencies unaffordable
- Pushing the seamless integration of academics and health care in new ways



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In a recent AAHC poll, our members' dominant concerns are:

- Clinical market consolidation
- Clinical funds flows
- Research funding
- Leadership transitions



AAHC survey

Education Mission: Impact & Response

Impacts on education mission (N=56)	
Reduced funding streams to subsidize the cost of medical education	62%
Increased interest by partners in training opportunities in primary care and community-based settings	41%
Other	7%

Response to education impacts (N=58)	
Increased emphasis on inter-professional training programs to meet future workforce pipeline needs	88%
Increased health professions school(s) student enrollment to meet future workforce pipeline needs	57%
Opened a new health profession school(s) to meet future workforce pipeline needs	29%
Other	3%



AAHC survey

Research Mission: Impact & Response

Impacts on research mission (N=58)	
Reduced funding streams to subsidize the cost of research	60%
Increased interest of sponsors in translational research or community-based research	43%
Other	9%

Response to research impacts (N=59)	
Increased emphasis on population health/community-based research	78%
Increased emphasis on translational research and implementation of new scientific discoveries	73%
Increased collaborations with industry groups and non-profit funders	69%
Organizational realignments to streamline academic operations	46%
Other	2%



AAHC survey

Clinical Mission: Impact & Response

Impacts on clinical mission (N=60)	
Consolidation of health systems within academic health center's market	78%
Change in owned or affiliated hospitals or practice plan operating margins	67%
Narrowing of insurance networks in market to exclude the academic health center	33%
Other	8%

Response to clinical impacts (N=60)	
Major expansion of clinical network	67%
Large scale initiative to improve clinical quality	63%
Large scale clinical cost-reduction initiative	62%
Organizational realignments to streamline clinical operations	60%
Merger or other form of clinical consolidation	53%
Spinning off clinical operations to improve financial flexibility and responsiveness	17%
Spinning off clinical operations to limit liability	7%
Other	8%



The current and coming environment

- The “guild” is rapidly eroding as knowledge expands outwards
- Rapidly developing technologies are driving entrepreneurs, driven by the trillions spent on health care, to produce “solutions” that go beyond and/or bypass the academic health center



We don't really know what the future healthcare workforce will look like

“Simply adding more doctors to the current mix is not a thoughtful solution to workforce challenges.”¹

“It is not possible to determine the future shape of health care delivery and to project the workforce needed”²

1. From Pizzo et al. The Future of Graduate Medical Education: Is There a Path Forward? Chapter 11 in *The Transformation of Academic Health Centers*, Elsevier, May 2015
2. Nasca and Thomas. Medicine in 2015: Selected insights from ACGME's scenario planning. *J Grad Med Ed*, March 2015: 139-142

But there are *existential* vulnerabilities

- “With the possible exception of organized religion and the courts, few institutions of modern society so rigidly adhere to tradition as academe”
 - Crowe and Dobars, Designing the new American University, Johns Hopkins Press: 2015
- “Institutions seek to preserve the problem to which they are the solution”
 - Clay Shirky <http://kk.org/thetechnium/the-shirky-prin/>



The path forward

The commitment to aligning patient care with teaching and research is core



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Setting foundational goals

- Restructuring health professions education to meet changing and evolving societal needs
- Linking research to improved health outcomes
- Transforming patient care based on population needs and priorities

Pushing beyond the ivory tower

Two essential areas

1. Engagement with the private sector and other external entities
2. Adapting to technologic breakthroughs (rather than resisting them)



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1. Engagement strategies for academic health centers

- A consolidating market often requires partnership development
- The engagement could be with health providers, companies, foundations, among others
- But academic health centers are often late to the table and without a clear strategy



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Eight keys to successful collaborative partnerships

1. Decide on the best mission balance for the organizations involved
 - Do not assume that you can drive your missions across the partnership with the same focus and prioritization as before
 - Strive to achieve an operational form of alignment by emphasizing those areas where each partner can make the greatest contribution
 - Respect for mission differences must be built in

Eight keys to successful collaborative partnerships

2. Create a “bridge board” or its equivalent
 - Representatives of the boards of the entities involved
 - Sets the tone for productive engagement
 - Manages the big picture only
 - Monitors the execution of the partnership
 - Evaluates the partnerships’ senior leadership



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Eight keys to successful collaborative partnerships

3. Be prepared to give up something to make the partnership work
 - Necessary to demonstrate confidence in the value of participation
 - Promotes trust in the newly formed entity
 - Goes beyond monetary support to ameliorate issues of control and dominance



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Eight keys to successful collaborative partnerships

4. Form an implementation team across the partnership
 - Essential in order to execute the strategic vision
 - Full-time effort tasked with operationalizing the partnership
 - Selected from each institution and/or from the outside



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Eight keys to successful collaborative partnerships

5. Leave egos at the door
 - Each leader must believe (and act accordingly) that the other partner(s) makes his/her institution better
 - Confidence and arrogance should not be confused with competence
 - Emotional intelligence is as necessary as intellectual capacity

Eight keys to successful collaborative partnerships

6. Manage the clash of the horizontal and vertical forces
 - Communicate constantly to circumvent the problem of comfort with the status quo

Eight keys to successful collaborative partnerships

7. Adapt new business models that work for the system as a whole
 - Adapt and/or develop new business models as needed for the new entity
 - Take into consideration the operational implications of changing clinical care delivery, payment systems, research trends, and education platforms



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Eight keys to successful collaborative partnerships

8. Do not lose sight of the big picture
 - Successful partnerships are not solely dependent on finding the right financial model
 - They are also dependent on a deeper understanding and appreciation of the entities involved

In sum, successful partnerships

- Based on a careful risk/benefit analysis
- Not solely dependent on finding the right financial model
- Rely on a deeper understanding and appreciation of the entities involved
- Grounded on a plan that engages the strengths of each institution and the partnership as a whole
- Are effectively implemented



Pushing beyond the ivory tower

Two essential areas

1. Engagement with the private sector and other entities
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Care by machines (c⁴)

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Machines are busy disrupting our mission areas

- Education of healthcare professionals
- Biomedical and clinical research
- Patient care delivery and population health

The reality

- No human can effectively process the exploding volume of medical knowledge and data
- Machines will know more and be able to perform more tasks than care givers
- Devices out-perform human capacity in both the cognitive and physical senses



The rise of smart machines

- The market for the mixture of intelligent algorithms and robots is growing seven times faster than traditional manufacturing robots¹

1. Business Insider, February 2015

Robots trending in healthcare

- Examples -

- Data management: Watson-like models
- Dispensing meds: robot pharmacists
- Administering cancer treatments: Nano robots
- Diagnosing diseases: pap smear screening
- Caring for the elderly: 24 hour live-in robots
- Surgical robots: now a billion dollar industry in a growing range of medical specialties



- Medicine is becoming digital...we'll eventually be able to use artificial intelligence instead of doctors for much of our health care

- Vivek Wadhwa in Forbes, 12/14/15,

<http://www.forbes.com/sites/chasewithorn/2015/12/14/artificial-intelligence-doctors-and-virtual-reality-vacations-are-on-the-horizon/#6935f6bd544a>

- You'll be paid in the future based on how well you work with robots

- Kevin Kelly, quoted in Brynjolfsson and McAfee, The Second Machine Age, Norton: 2014.

The challenge

- The private sector, economic and political forces have the potential to “bypass” the academic health center hegemony on education, research and patient care
- What is the space for academic health centers in this environment?

Example: technology and machines

QUESTION:

- “Will smart machines replace humans like the internal combustion engine replaced horses?”¹

1. <http://www.esquire.com/lifestyle/a34630/viv-artificial-intelligence-0515/>



JAMA Viewpoint 2-9-16

“The profession of medicine has a tremendous opportunity and an obligation to oversee the application of this technology to patient care.”

- Darcy AM, Louie AK, Roberts LW, JAMA
2016; 315: 551-2.

We need to take the lead in answering a series of daunting questions

- In healthcare (and other fields), what is the role that humans will play?
- Who ultimately manages the machines?
- What is the reality of the “human touch?”
- How do we need to change our curricula and care practices?
- What kind of future planning is essential now?



- How does the human factor in medical decisionmaking go beyond probabilities to address uniquely human complexities?

Managing the interface between humans and machines

- Calls for a new kind of mastery -

A New Kind of Professional intelligence
Based on the confluence of professional values and expertise



“Healing, whether physical or emotional, is an experience of life, one that technology can never replace.”¹

- Is this [still] true? –

1. Polacco MA. The \$6 million physician. *The Pharos* 2015; 78(2): 11-15.

- The greatest clinicians...have a sixth sense for biases
- The discipline of medicine concerns the manipulation of knowledge under uncertainty

- Siddhartha Mukherjee, The Laws of Medicine, TED Books, 2015



But can they love us back?

- The issue is not can humans develop deep emotional attachments to machines, but rather can machines develop deep emotional attachments to humans?

not so
The new “physics” of patient care

$$E = mc^4$$



Healthcare in the Future

newer
The ~~new~~ “physics” of patient care

$$E = mc^7$$



c⁵ = Character for ethical practice

- “...the physician’s duty is not to stave off death or return patients to their old lives, but to take into our arms a patient and family whose lives have disintegrated and work until they can stand back up and face, and make sense of, their own existence.”

- Paul Kalanithi, When Breath Becomes Air, Random House, 2016



c⁶ = Choice

- Respecting the right of patients to make choices according to their values

c⁷ = Compassion

- *Not every patient can be saved, but illness may be eased by the way doctors respond*

- Adapted from Intoxicated By My Illness, Anatole Broyard, Ballentine Books, 1992

In sum, an academic health center will be well-positioned for success if it:

- Captures the power of an organization that *aligns* academics (teaching and research) with the care of patients
- Focuses on the *next generation* of education, research and patient care
- Has the *transformational leaders* to change culture and behavior
- Enters into *strategic partnerships* that advance health and well-being



Thank you



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