



Association of Academic Health Centers®

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Is There a Future for Generalism?

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Thinking about the future

-Some words of caution-

Was it Yogi Berra who said:

- The hardest thing to predict is the future, and
- The future ain't what it used to be

So here's one thought about the future...

- See video on Luddite Horses linked below

CGP Grey. (2014, August 13). Humans Need Not Apply. [Video file]. Retrieved from <http://youtu.be/7Pq-S557XQU>

Are we at risk of becoming luddite ~~horses~~ generalists?

- Our usual rationalizations:
 - Patients want a long-term caring relationship with a provider who not only knows them but can understand their unique needs
 - Patients want a provider that can navigate the complex healthcare delivery system to provide appropriate high-value care
 - Patients want someone to discuss their overall health needs, make recommendations, and look out for their best interests

But is this hold up for 21st century healthcare?

- The profession is rapidly losing its guild mentality with significant non-professional empowerment
- The locus of care is changing via the internet, social media, scientific discovery, and other technologies
- Care increasingly delivered by the collation and assessment of big data sets and broad teams of healthcare professionals
- And then there is...

The “Doctor Bots”

- See video linked below

CGP Grey. (2014, August 13). Humans Need Not Apply. [Video file].
Retrieved from <http://youtu.be/7Pq-S557XQU>

So what are some “thought leaders” saying about this

- Most quoted here are outside the profession and have vastly different perspectives from those of us who have grown up “inside the tent”

- 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>

- Inevitably, over 20 years, the majority of physicians' diagnostic, prescription and monitoring functions will be replaced by smart hardware, software and testing.
- Nurses, enabled by technology, will replace many of the functions doctors perform today.
- The core functions necessary for complex diagnoses, treatments and monitoring will be driven by machine judgment instead of human judgment.
- Today's doctors are not qualified to judge what surprising software technologies may emerge in the future.

- Venod Khosia, Techcrunch, Sept 22,2014,

<http://techcrunch.com/2014/09/22/the-reinvention-of-medicine-dr-algorithm-version-0-7-and-beyond/>

- 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.

- If patients readily open up to a machine, will clinicians be needed at all?

- John Bohannon, The synthetic therapist, Sciencemag, July 17, 2015

From inside the tent

- Perhaps the time will come when physicians are entirely removed from the healthcare picture

-Robert Wachter, in *The Digital Doctor*, McGraw Hill: 2015

A game-changer for generalists?

- 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

The reality

- The guild is rapidly eroding as knowledge expands outwards.
- Entrepreneurs, driven by the trillions spent on health care, are producing “solutions” that go beyond and/or bypass the profession.

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% |

These responses are mostly an understandable immediate reaction to the “new physics” of patient care that is now upon us

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
- Machines don't get tired
- Machines are a real threat to generalists

Machines are busy disrupting our mission areas

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

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

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

What are the implications of the “new physics” for generalists?

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

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
- Can generalists find their space in this environment?

**Generalists need to recalibrate
now for 21st century medicine**

21st century recalibrations

Some suggestions

Preamble: be guided by the unique value proposition of academic health centers

AHCs build the knowledge economy and apply that knowledge to improve health and well-being

- 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

21st century recalibrations

1. Decide on the best “mission-balance” for your department

- Emphasize those areas where the department can make the most difference and greatest contributions
- Budget accordingly

21st century recalibrations

2. Prepare for the era of no more open-ended funding by being more efficient

- Develop methodologies and tools to assess efficiency, especially in those areas chosen for emphasis
 - Determine what is meant by research, education, and administrative FTEs
- Establish how much you are willing to invest in both current and new areas and gauge how to account for optimization



21st century recalibrations

3. Develop an integrated, interprofessional global vision

- Improve interconnectivity at all levels to capture the combined power of all relevant components
- Shift the operations and leadership from a highly siloed enterprise to an aligned organizational structure
- Develop networked and interconnected consortia with other institutions around the globe



21st century recalibrations

4. Broaden the understanding of what your department entails

- Actively incorporate disciplines previously viewed as external (e.g., engineering and business management) as core healthcare disciplines to facilitate health system change
- Shift view of mission from management of individual patients to management of community and population health (locally, regionally, nationally, and globally)



21st century recalibrations

5. Address comprehensively the social determinants of health

- Increase consideration of the patients' environment in all mission areas
- View population health as a primary goal

21st century recalibrations

6. Find the right leaders

- Evaluate leadership skills – not just academic skills – as part of the search process
- Understand and support the qualities of a good leader
- Create leadership development programs

21st century recalibrations

7. Take the lead in “managing the machines”

- Machines are perhaps the greatest threat to generalism

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.

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

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

We need to answer 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 will humans and machines interact?

- 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
- But what about the personal, caring relationship?

“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.

One futurist's view

“There will be no distinction...between human and machine or between physical and virtual reality.”

- Ray Kurzweil, *The Singularity is Near*, Penguin Books, 2005, p 9

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

- 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?

- There is not a good track record of less intelligent things controlling things of greater intelligence
 - Geoffrey Hinton, quoted in The Doomsday Invention by Raffi Kharchadourian, The New Yorker, Nov 23, 2015.

A path forward?

- *“Not every patient can be saved, but his illness may be eased by the way the doctor responds to him – and in responding to him, the doctor may save himself...In learning to talk to his patients, the doctor may talk himself back into loving his work.”*

- Intoxicated By My Illness, Anatole Broyard

Healthcare in the Future

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

$$E = mc^5$$



Compassion (c⁵)

“Not every patient can be saved, but his illness may be eased by the way the doctor responds to him – and in responding to him, the doctor may save himself...In learning to talk to his patients, the doctor may talk himself back into loving his work.”

- Intoxicated By My Illness, Anatole Broyard

“...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.



Departments of Family Medicine will be well-positioned for success if they:

- Capture the power of *aligning* teaching and research with the care of patients and populations
- Focus on the *next generation* of education, research and patient care/population health
- Have the *transformational leaders* to change culture and behavior
- Take a lead in *managing machines!*



Thank you



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