Make The Future

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Looking into the future

• Health and healthcare are undergoing more changes and at a faster pace than ever before in history.
• These changes require us to anticipate the impact on all aspects of health and healthcare to address the needs of the future.
• Roles of individuals must change as well as relationships among individuals.
It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change.

Charles Darwin
The future is not a gift – it is an achievement.
Albert Einstein

The best way to predict the future is to create it.
Abraham Lincoln

The future ain’t what it used to be.
Yogi Berra

It’s our turn to make history!
• Change is continuous.
• Change is ubiquitous.
• Change rate is exponential.
• Change occurs at its own volition.
• Change impacts each of us.
• Our future will be dictated by change.
TECHNOLOGY …

The primary driver of change

- Computational power & size
- World Wide Web and Internet
- Instant communications world-wide
- Smart phones and mobile devices
- Wearable sensors and the Internet of Things
- Cloud computing
Change in focus

- Shift from “sick” care to health
- Shift from fee for service to value based care
- DIGITAL HEALTH
- New emphases
  - Precision Medicine
  - Population Health
  - Patient-Centric EHRS
  - Health Information Exchange
  - National and Global Registries
  - Creation of Big Data
Policy, process, and focus change

- Policies of data sharing and patient-centric EHRs create Big Data with clinical research producing new knowledge.
- Site focus shift to the patient: telemedicine
- New types of data including behavioral, social, economic, genomic, environmental plus clinical.
- Increased focus on patient/consumer
  - Consumer engagement – population health
  - Personalization of care – precision medicine
  - Patient reported data
Big Data

• Big data is a consequence of more things that create and more initiatives to merge data.
• Big data is not so much about the size as it is the predictive analytics performed on that data.

In 2017, we created 44 zettabytes of new data daily.

1 zetta byte = 10^{21}
1,000,000,000,000,000,000,000
New Voices …

- Patients, consumers, citizens or whatever we wish to call them are having an influence in health and health care.
- “Googling” has opened the knowledge and understanding of disease for the non-professional to change the communication between physician and patient.
- Shifting care outside traditional settings
- Data collected and analyzed in real time becomes more responsive.
- Patients want to push this data back into their EHR.
New Methods

• Predictive Analytics
• Clinical Decision Support
• Artificial Intelligence
• Machine Learning
• Virtual and augmented reality
• 3D Print
Decision Making

• The amount of data and the kinds of data influencing health and health care has far exceeded the ability of the human brain to make fact based decisions.

• Therefore, decisions will be made by computers and executed directly without human engagement.
Multiple roles

- Counseling
- Education
- Companion-ship
- Caregivers
- Hospice
- Others

Sophia

Tomorrow’s Nurse
Data Sharing becomes the norm

- Organizations unable to share patient data will find it very difficult to improve quality and avoid financial penalties under value-based care.
- Unique and universal patient identity becomes mandatory for error-free aggregation of data.
- Success depends on interoperability and that requires standards.
Make the future – don’ts

• Don’t assume the barriers that currently exist are here to stay, anything we do must fit within those boundaries.
• Don’t spend do work-arounds rather than face the true problem.
• Don’t avoid the hard problems.
• Don’t solve a problem with a siloed outlook.
• Don’t tackle today’s problems with yesterday’s tools.
Make the future - do

• Look at the total picture.
• Fully understand the problem.
• Assume barriers are part of the problem that must be solved.
• Have unbounded vision.
• Create true collaboratives.
• Be willing to accept new thoughts.
• What’s wrong with perfect?
The art of the future possible

• The volume of data, the variety of data types, the increasing wealth of knowledge, and the ability to track disease and co-morbidities from start to finish will overpower the ability of humans to make informed decision about health and health care.

• Computers will not only become the decision makers but will carry out the decisions directly.

• The role of the human clinician will change to being an interface between computers and patients, and that may only be a temporary step.

• Humans will be replaced.