Health Care Without Walls: What It Means for Practice, Education, and Training

Presentation by Susan Dentzer

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To the Nexus Summit

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NATIONAL CENTER for INTERPROFESSIONAL PRACTICE and EDUCATION

NEHI Network for Excellence in Health Innovation

This Presentation at a Glance

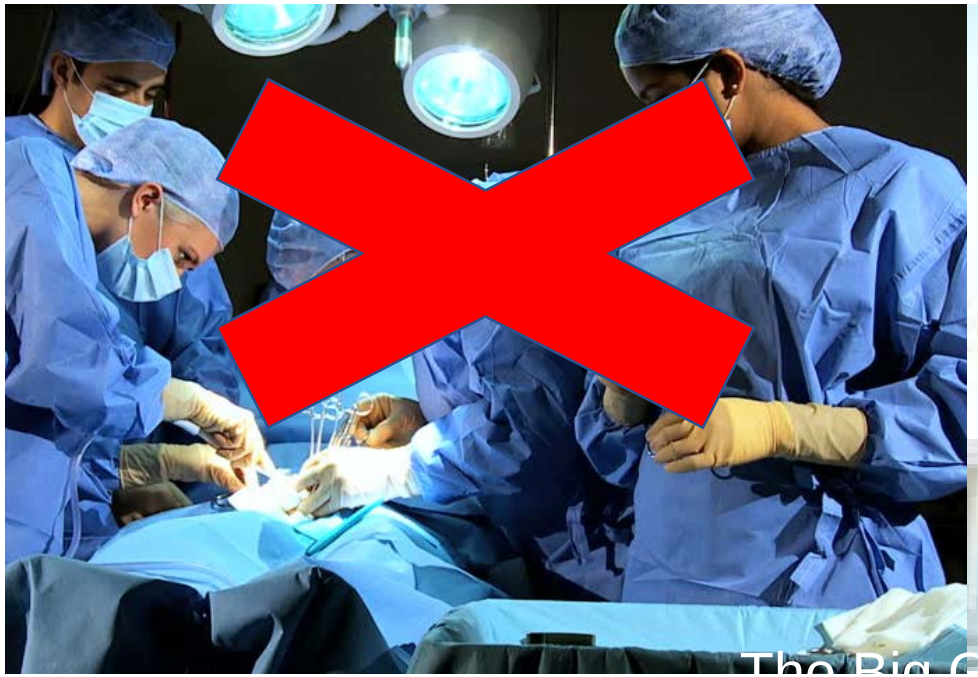
- Health Care Without Walls: The Vision
- Background on NEHI’s Initiative
- The Technological and Work Force Changes Ahead
- Key issues for interprofessional practice, education, and training

About NEHI

- A national **nonprofit, nonpartisan** organization; offices in DC, Boston
- Stakeholders/members from across **all key sectors** of health and health care
  - **Roughly 90 premier health, health care and health services organizations**
  - **Members include patient groups, hospitals and health systems, health plans, employers, universities and companies in the pharmaceutical, biotechnology, medical device, health technology, and health services sectors**
- **Mission: To advance innovations** that improve health, enhance the quality of health care, and achieve greater value for the money spent.
- **What we do**: NEHI consults with its broad membership, and conducts **independent, objective research** and **convenings**, to accelerate innovation and bring about changes within health care and in public policy.
- **Learn more about NEHI: http://www.nehi.net or @NEHI_News**

The Big Questions

What if, instead of a “sick care” system, we had a health care and health-inducing system that went to people – rather than people going to it?

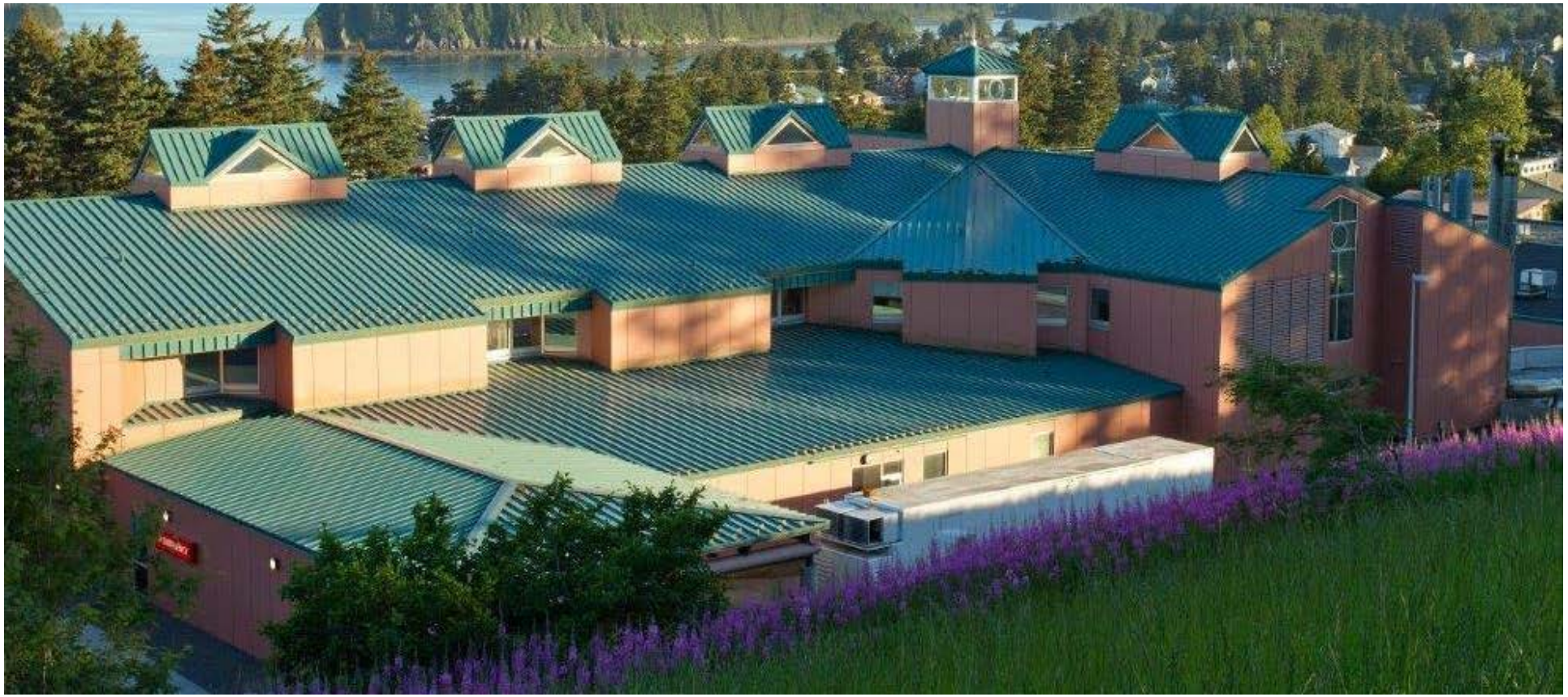


The Big Questions:

For health care that mainly involves exchanges of information – not the laying on of hands – why isn't more of it done virtually today?

Why do we have “Star Wars” medicine on a “Flintstones” delivery platform?

First…a story



Providence Kodiak Island Medical Center

Memorial Sloan Kettering Cancer Center, New York

Clinicians, MSK, New York

Distance from Kodiak to New York City:
3,154 miles

Dave's options:

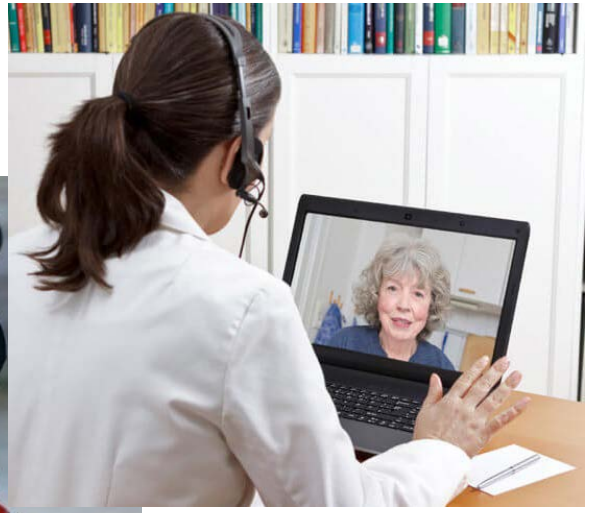
- Try to book appointment at major cancer center
- Fly to NYC; overnight at hotel
- Have consultation; obtain advice on treatment plan
- Then what?

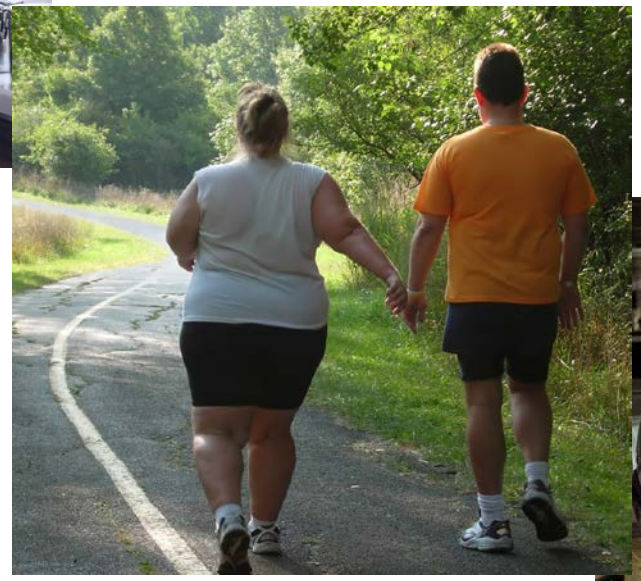
What of all this is technically (or technologically) possible today?

What of all of this would happen today?

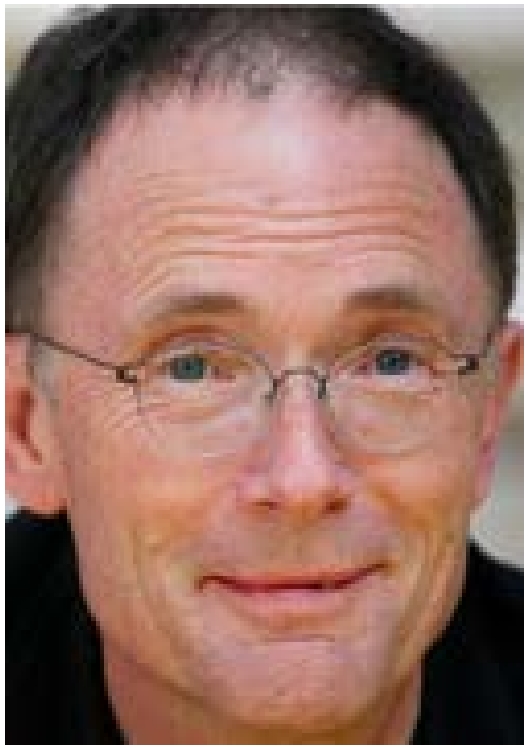
Would we prefer a system of “health care without walls” to what we have today?

Who Could Benefit?





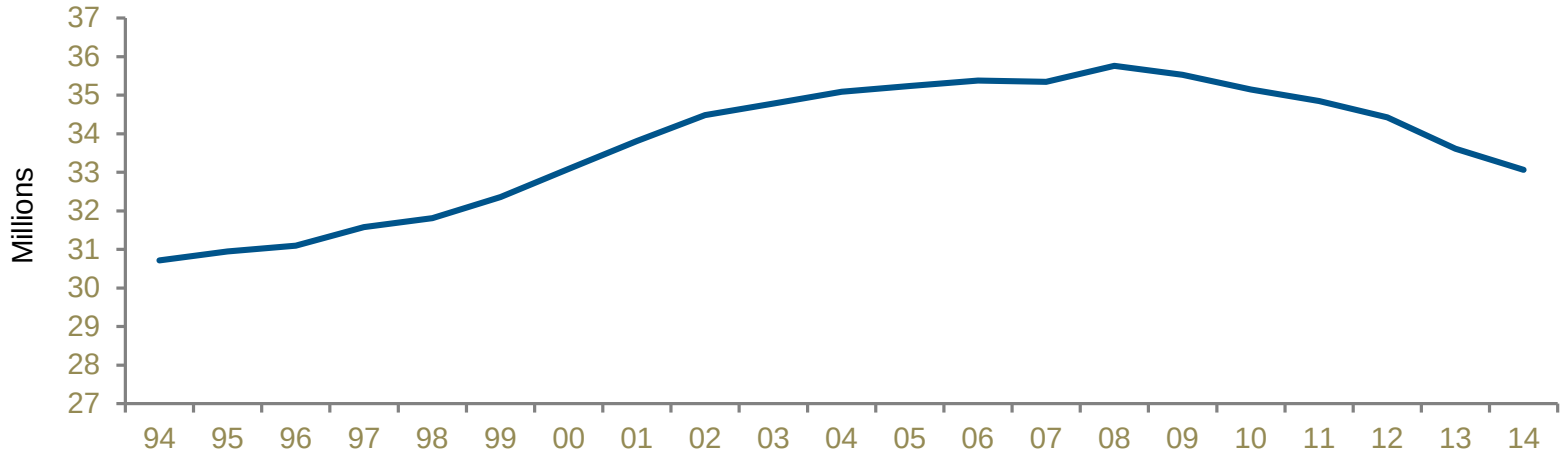
The State of Play



- “The future has already arrived. It’s just not evenly distributed yet.”

- --William Gibson, science fiction writer who coined the term “cyberspace”

Declining Inpatient Use: Admissions in community hospitals, 1994-2014



Source: Analysis of American Hospital Association Annual Survey data, 2014, for community hospitals.

Intermountain Healthcare's "Virtual Hospital"

- "Connect Care Pro"
- Brings together the system's 35 telehealth programs and more than 500 providers and caregivers.
- All of Intermountain's 22 hospitals, including 10 of its rural hospitals, using it
- Telehealth services provided include basic medical care as well as advanced services, such as stroke evaluation, oncology consults, mental health counseling, intensive care, genetic counseling, and newborn critical care.

Use Case: Newborn Intensive Care

- Infant at a southern Utah hospital received a critical care consultation that avoided transferred to NICU in Salt Lake City
- Avoided transfer saved more than $18,000; family able to remain in community in lieu of traveling 400 miles round trip to see baby.
- Using same technology to reduce need for transfers of ill newborns to other hospitals, Intermountain says it lowered cost of care for patients by more than $2.1 million over several years

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Connected Care at Dartmouth-Hitchcock and Allied Hospitals

- Telehealth linkage from the only quaternary academic medical center in New Hampshire to community and Critical Access Hospitals throughout New England
- Serves catchment area of 3 million people scattered across New Hampshire, Vermont, Maine, Massachusetts
- E.g., Brattleboro Memorial Hospital, a 61-bed community hospital in southeastern Vermont serving rural population of 55,000 -- 71 miles away
- Enables acute specialty care in five service lines: emergency medicine, ICU, neurology, psychiatry, pharmacy

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Mount Sinai Health System's "Hospital at Home Plus" Initiative

- Mt. Sinai's Medicare Innovation 3-year CMMI demonstration project: avoid ED altogether, or send person from ED to home for acute care or observation
- Patients need to meet certain hospitalization criteria – no telemetry; "not too sick"
- Patient safety checklist: home needs running water, electricity, no guns or IV drug use
- Send patient home with everything needed: oxygen, medication, labs
- Regular physician and nurse visits; on-call service 24/7
- 20 percent savings overall; program now supported by commercial payers and being extended to other health systems under partnership with Contessa Health

Telehealth from Walgreens Pharmacies in New York City To New York-Presbyterian

- Immediate consultations available with emergency department physicians
- Recently, one middle-aged man on Medicaid had a consultation and was immediately transported to the hospital for apparent heart attack

Veterans' Health Administration

- VHA has made significant investments in telehealth and remote monitoring under its "Anywhere to Anywhere" initiative
- 2.1 million encounters to 709,000 vets in 2017; 150,000 vets being monitored at home via cell phone
- Now conducting a pilot telehealth program to provide remote access to psychotherapy and related services for rural Veterans with post-traumatic stress disorder (PTSD).
- A corps of vets now using FitBits and wearables to share information with providers
- Meanwhile, under the Million Veteran Program (MVP), up to 1 million vets being enrolled in an observational cohort study and mega-biobank as further platform for scientific and technological innovation

Ohio State College of Nursing

- Operates Ohio State Total Health and Wellness
- Nurse practitioner-led, interprofessional, comprehensive health center
- Uses telehealth to provide health care to the students, faculty, staff, and their dependents on the Lima, Ohio campus.
- With registered nurses on site with patients in Lima, primary care is delivered by nurse practitioners from the Total Health and Wellness center located in Columbus, 93 miles to the southeast.
- Plans to have nurse practitioner students undergo preceptorships at Total Health & Wellness to learn how to conduct telehealth consultations in a team-based setting with nurses, dietitians, and pharmacists.

Even more aggressive efforts abroad…in Norway

- Telenor: Norway's telecommunications company
- Trial now under way of mobile patient journal and remote monitoring of patients on home dialysis in Nordland
- Patients to be monitored by clinicians at Nordland hospital
- Aim to have 1/3 of kidney failure patients in Norway on home dialysis within several years
- By contrast: in US today, of 500,000 needing kidney dialysis, 1 in 10 now receive at home

Even more aggressive efforts abroad… In Bangladesh

Tonic Wellbeing

Health tips via FB / Web / Android App / SMS, including **health hero's, infographics, comic-strips** – backed by medical evidence base

Tonic Daktar

Access to a qualified doctor by phone, 24/7: SMS prescriptions, track previous health events and calls, follow up health tips

Tonic Cash

1000 BDT when you are in hospital for three nights or more. Insurance delivered over the mobile (claims, payments, enrolment)

Tonic Discounts

Largest **national healthcare partner network – 250+ hospitals, pharmacies, diagnostic labs, and lifestyle partners**

Save $1-2,000 USD with one SMS.

- 5 million subscribers to Tonic in nation of 167 million (mostly uninsured)
- 5 billion people worldwide now have mobile phones

And it’s not just about the technology….it’s about the people!

- Former hospital housekeeping staff at Wake Forest Baptist Medical Center
- Now “ambassadors of health” for FaithHealthNC – community health workers – calling on community members, including those recently discharged from hospital
- Instrumental in helping to lower readmission rates

What is the potential of more distributed care?

- Drastically increase care convenience
- Increase access, especially in underserved areas
- Leverage and extend existing provider base
- Universalize and democratize knowledge and expertise
- Reduce unnecessary “friction” in system – e.g., lost productivity, absenteeism from work
- Cut costs

What is the potential of more distributed care?

- Address social issues in communities that contribute to poor health and drive health care utilization, such as hunger, lack of transportation, housing insecurity
- Meet patients where they are – including at home – via technologies including telehealth and smart phones

What's driving trend of distributed care?

- #1: The move from volume to value and demands for more affordable and more convenient care
- #2: Poor health of population and focus on upstream drivers of "population health"
- #3: Evolution of precision medicine
- #4: Innovation in care delivery
- #5: Information and Technology; big data, predictive analytics, and AI arrive in health care

Background: NEHI's Health Care Without Walls Initiative

- Launched with convening in Washington, DC in May 2017
- Support received from foundations and corporations, including Gordon and Betty Moore; California HealthCare; Jewish Healthcare
- Established five work streams with more than 200 participants
  - **Technology**
  - **Payment/Reimbursement**
  - **Federal and State Regulations**
  - **Human Factors**
  - **Health Care Work Force**

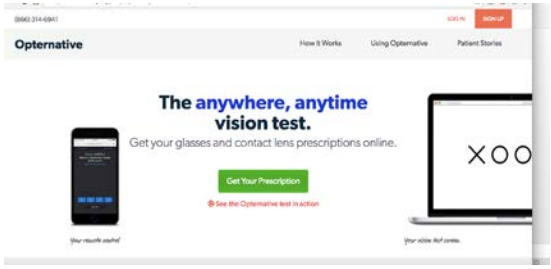
Technology

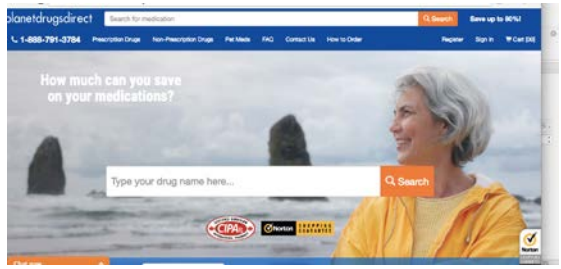
What technologies exist today?

What We Mean When We Say “Technologies”

- Most of the technologies we refer to are information technologies
- We use technology in the broadest sense, to include **the entire digital universe and information analytics,** among others
- We specifically include the following:

  - Telehealth and telemedicine
  - Software, such as SaMD (software with a medical purpose)
  - Data and information exchange
  - Clinical decision support systems
  - Artificial intelligence, cognitive computing, and machine learning
  - Internet-enabled health devices and the Internet of Things
  - Mobile medical applications; medical device data systems, used for the electronic transfer, storage, display, or conversion of medical device data; medical image storage devices, used to store or retrieve medical images electronically; and medical image communications devices, used to transfer medical image data electronically between medical devices
  - “Low-risk” general wellness products, such as apps
  - Lab tests, such as self-administered tests, and other technologies involved with laboratory work flow
  - Autonomous cars
  - Drones



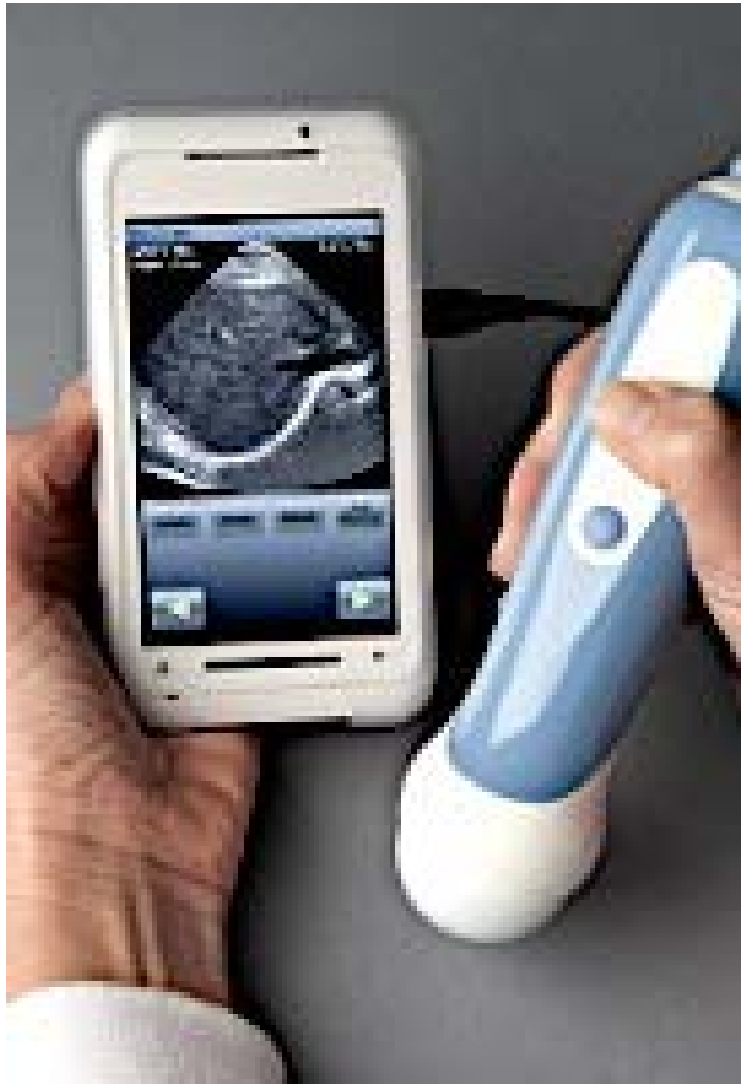


More Services Accessible Online

Teleradiology

- Increasingly used by hospitals, urgent care clinics and specialty imaging facilities and companies
- Driver today is often lack of adequate radiology staff
- In future, predictions that most images will actually be “read” via artificial intelligence, deep learning and neural networks technology

- *See, for example, Jha S, Topol EJ, “Adapting to Artificial intelligence: Radiologists and Pathologists as Information Specialists,” J*AMA*, December 23, 2016

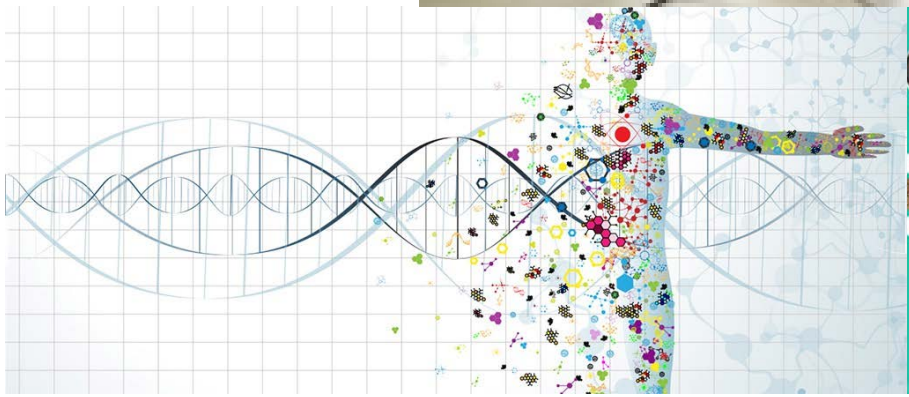


The Smart Phone – Or What Comes After It

- How many patient “encounters” could take place over a smart phone?
- Smart phone equipped with echocardiogram technology has already made stethoscope obsolete
- Potential enormous: e.g., handheld ultrasound; point of care cancer screening; sensors able to identify volatile organic compounds (VOCs) commonly associated with lung cancer

Remote Monitoring

- Various internet-enabled devices in the home or elsewhere
- Gathering and processing both environmental data and data about the various “omes”

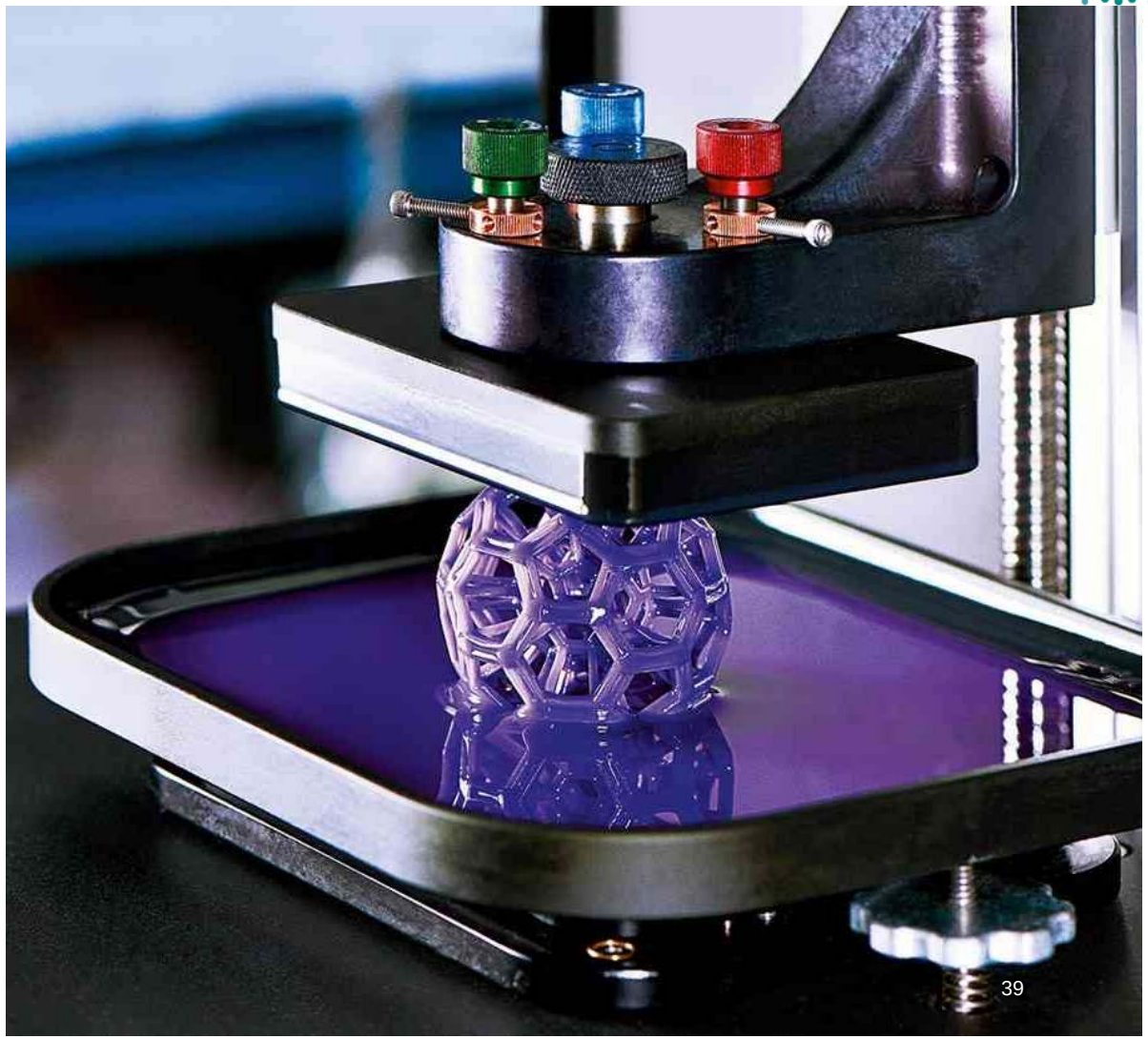


Self-administered lab tests

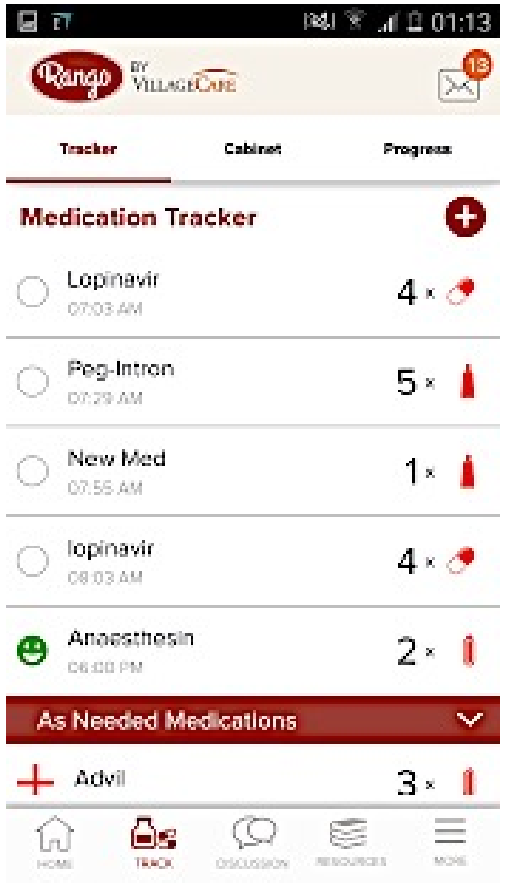
- HemoLink, needle-free, self-administered blood draw test device, (right), FDA-approved, backed by investment from Defense Advanced Projects Research Agency (DARPA)
- Just one of many self-administered lab tests in pipeline

3D Printing

- Increasingly small and portable printers
- What devices, etc. could be tailored to patients and “printed” right in their homes, offices or other distributed settings?



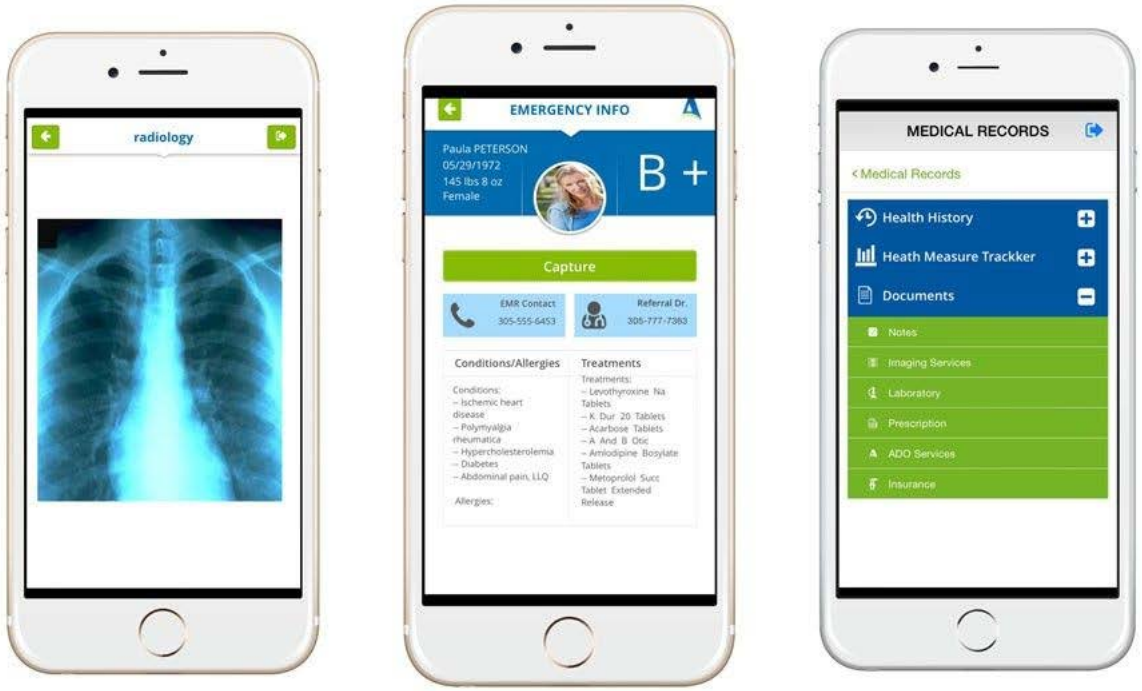
Mobile Health Care Management Apps & Related Technology



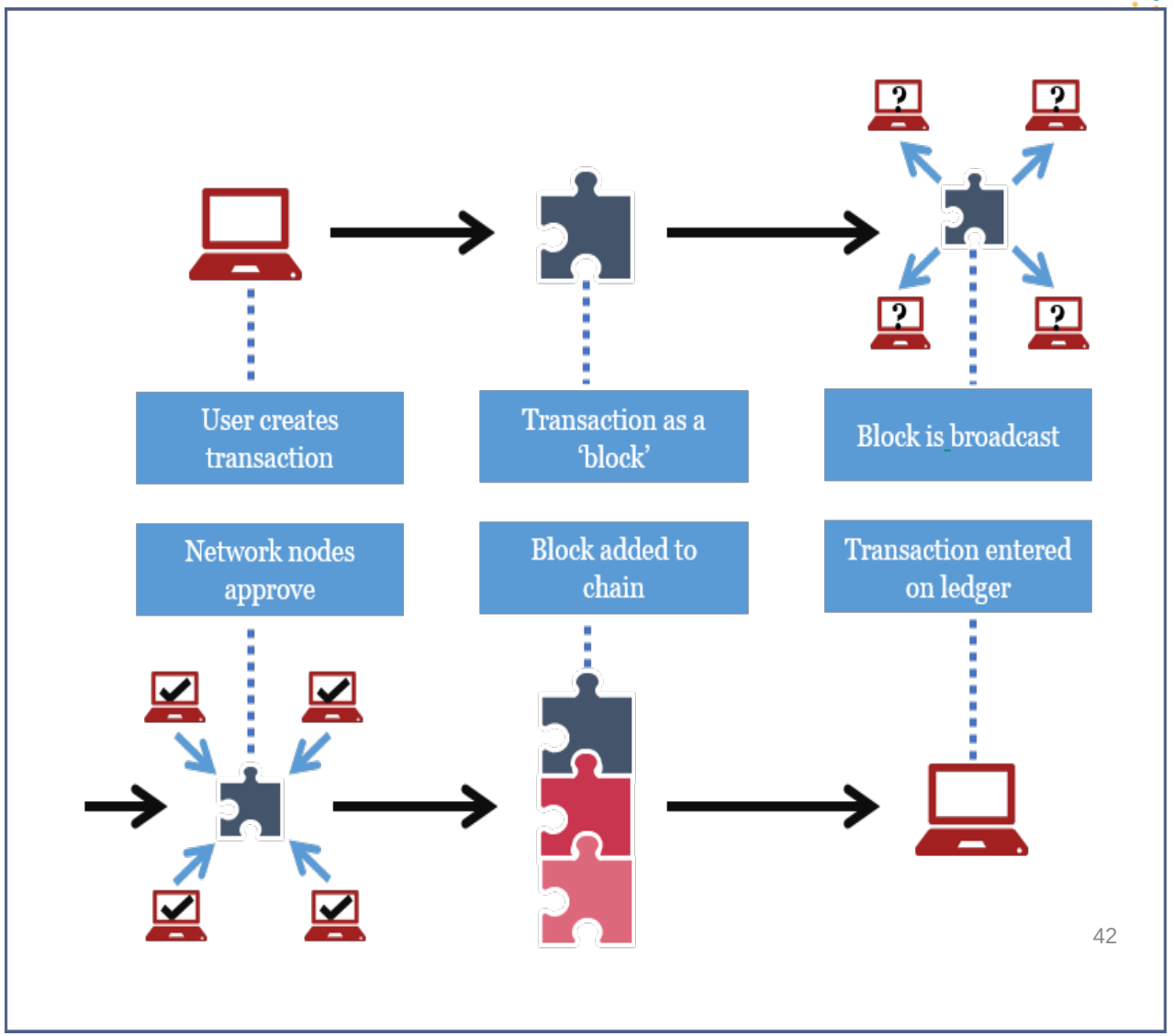
Left: Rango, a suite of care management tools offered by VillageCare, a Community-based Nonprofit organization, for its HIV/AIDS patients in New York City

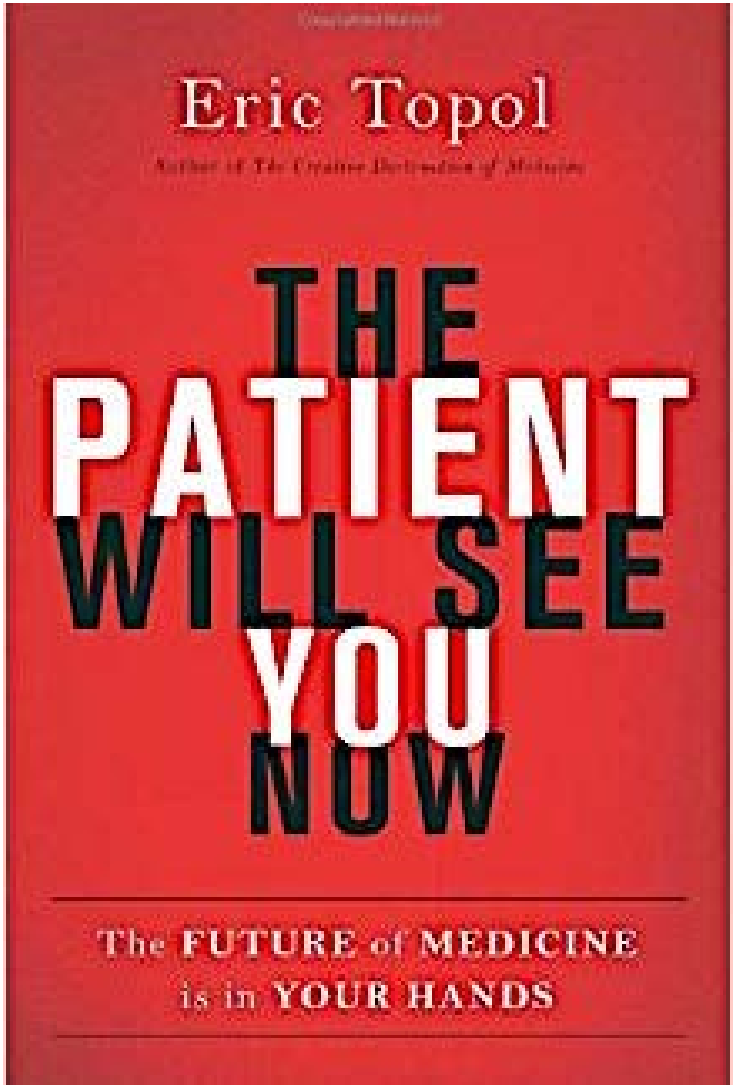
Health Information Technology

- Electronic health records and application program interfaces (APIs) that enable mobile access



Secure and Private Communications: Blockchain Technology



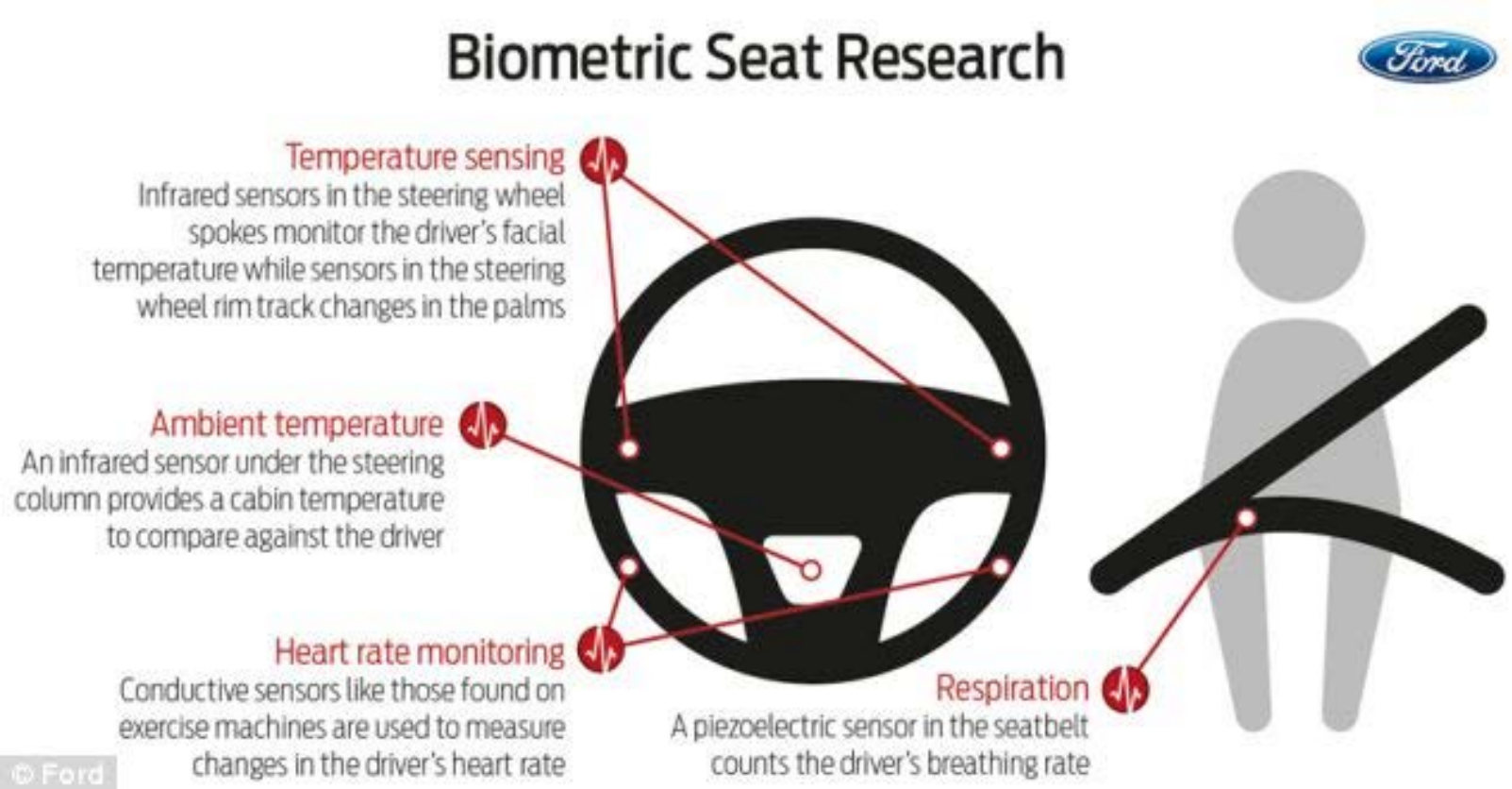


The Digital Health Explosion

- Eric Topol, MD, Scripps Research Institute
- Data could ultimately be collected from ten “omes” – including genome, epigenome, physiome, anatome, proteome, metabalome, microbiome, transcriptome, phenome, and exposome
- Potentially one trillion bits of data per person per year; worldwide health data expected to double every 73 days over the next decade
- “Internet of Medical Things” to lead to 50 billion connected devices globally by 2020 -- about 6-7 per person
- Opportunities for vastly more predictive analytics and other means of harnessing data

Autonomous Cars

Technologies in Cars: Sensors



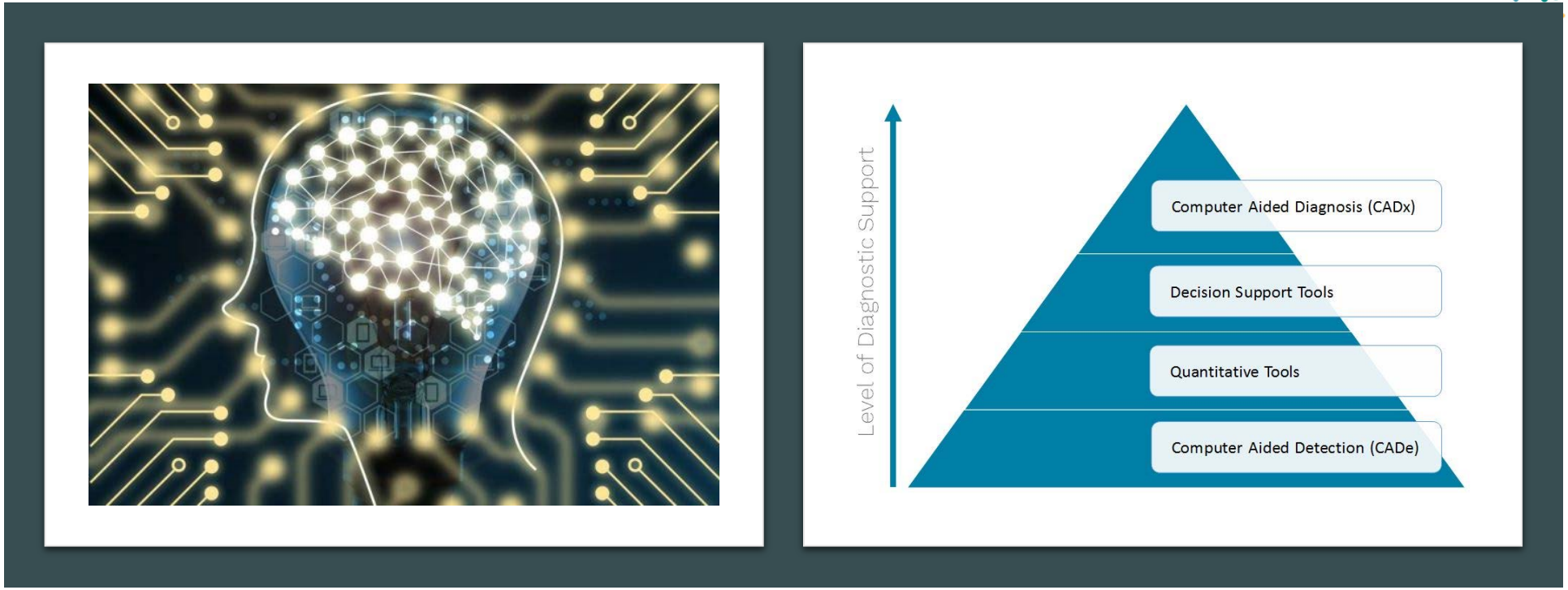
Drones

- United Parcel, Amazon, among companies testing use of drones in health care
- UPS exploring emergency deliveries of medical supplies
- Test flight in September 2016 by CyPhy, a Massachusetts-based drone maker in which UPS has stake)
- Drone delivered small package in 8 minutes from Beverly, 25 miles northeast of Boston, to Children's Island, a summer camp for children three miles off the Atlantic coast.

Future of Robotics

- From conventional hospital robots distributing goods today…

➢ A walking robot could easily visit an individual in a home to deliver medications or perform tests



Machine Learning/

Cognitive Computing And

Clinical Support Activities

Precision Medicine

Genetic screening, analysis, and prediction; application of ”targeted” therapies and treatments

Different Setting to Consider - Worksites, Schools, Homes

Multiple Obstacles to Overcome

- Inertia: systems have to change
- Lots of sunk costs in existing plant and capital
- Need for different work force?
- Human factors involved in technology take-up
- State laws and regulations still impede activities such as telehealth
- Data privacy and security; HIPAA and state statutes
- Lack of high speed broad band access, internet connectivity in much of country

Goals of Work Force Work Stream

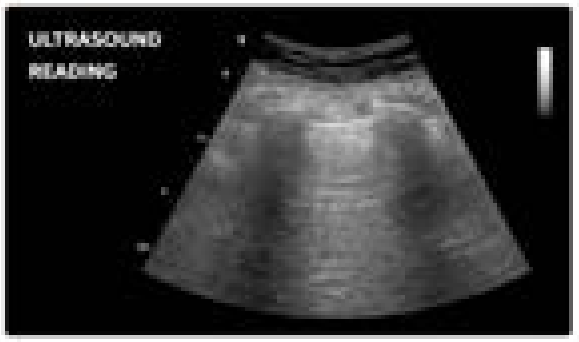
- Articulate a vision for a qualified work force capable of meeting the health and health care needs of Americans, in large part through more distributed care.
- Articulate a vision of a work force that advances the *health* of Americans, not just the health care.
- Identify new roles and responsibilities for existing types of health care workers, as well as needs for new types of workers
- Identify new work environments and structures – e.g., team-based care; virtual relationships among team members; “gig” economy work relationships

KAISER PERMANENTE®

Crisis Event

Donna Green, MD — Doctor

Gary Jones — Navigator



Leo Montgomery

Medical Record #1567
Age 68 Height 6'1" BMI: Weight: 207 lbs
Medical Conditions: CHF, Hypertension
Allergies: Indicated x-ray contrast dyes, Sulfa drugs

HEART RATE
100

BLOOD PRESSURE
181/92

O2 SATURATION
91%

GLUCOSE LEVEL
130

RESPIRATION RATE
28

WEIGHT
207 215

FLUID READING

POTASSIUM
4

LISTENING PUCK

R

L

Choice 1
Hospital

Choice 2
Diuretic medication and follow up

Goals of Work Force

Work Stream

- Identify a process and methodology for determining appropriate types and numbers of competent health workers, given uncertainties about how technology may be implemented and used.
- Determine what types of education and training will prepare the future work force to provide safe, efficacious, efficient, accessible, cost-effective, and culturally appropriate care in distributed settings.

Additional Goals

- Identify knowledge/research gaps
- Prepare to educate policy makers and advocate for changes – e.g., rural health innovations sparked by federal policy
- and boards on coming transformation

The Consequences: Many Changes Needed

Our Key Recommendations

- It is in the nation's interest to foment this movement because of potential to expand access, democratize care, and lower costs
- It is happening anyway, but more slowly and less uniformly than desirable, and won't be a natural act
- Places where trends could have greatest payoff are least likely to see them – e.g., rural/underserved areas

Important Work Force Trends

❖ Work Force Changes

- Current “shortage” projections are highly flawed; no reliable, up-to-date methodology for estimating needs based on technological change
- Considerable flux ahead in the future health care labor force, with some jobs disappearing, new jobs being created, and tasks associated with existing jobs changing
- More team-based care in health care inevitable
- Major changes/new curricula needed in health professions education and training (undergraduate through graduate and CME), particularly at interprofessional level, and in retraining of current workers

Systematic Attack on Obstacles And Barriers Needed

- Work Force Changes
  - Major siting issues for GME – why train predominantly in hospitals?
  - New positions – e.g., community health workers -- will need to be created as others are displaced by technology and other forces
  - Scope of work restrictions need to be attacked; innovations in licensure also required
  - Parallel national licensure system desirable

Issues for Interprofessional Education

01

People will not only have to be educated and trained to work with each other on teams, but also with technologies

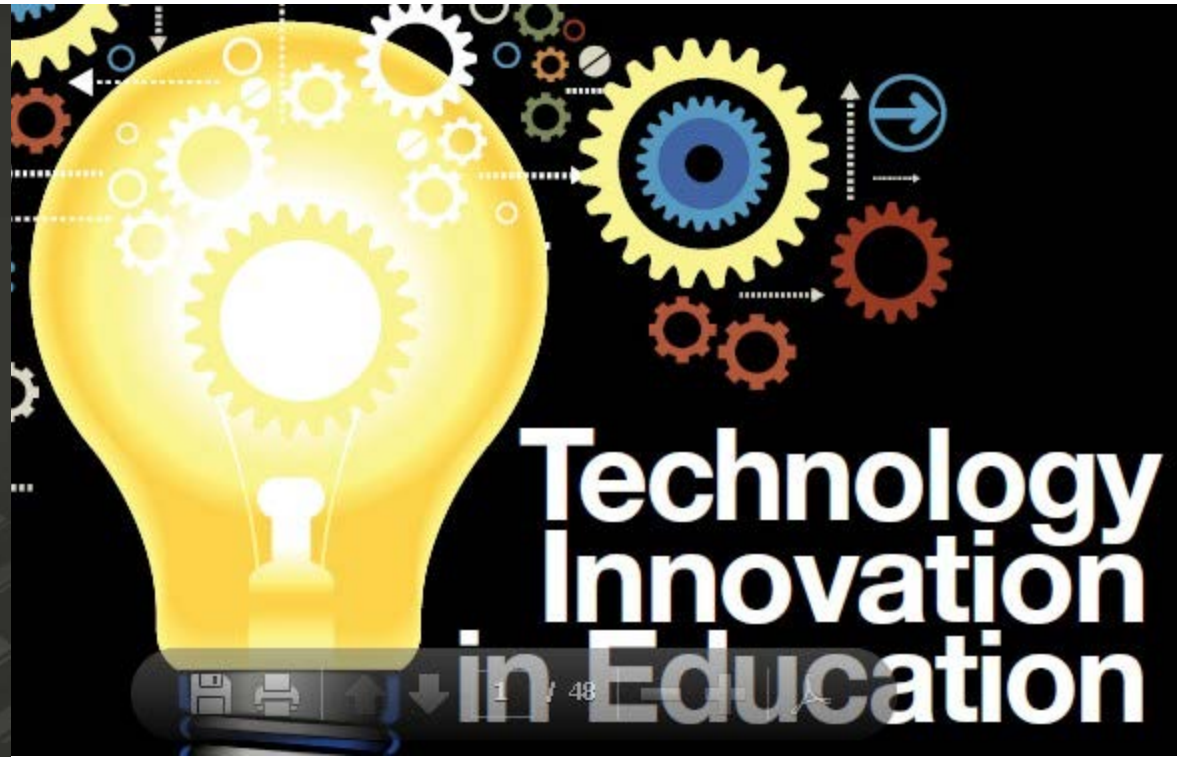
02

People will have to be educated and trained to be as adaptable and flexible as ever as knowledge and technologies change

03

People will have to undergo much more continuing professional and *interprofessional* education over course of their careers

Overriding Message



NEHI: Our Next Phase

- Release full report in 3Q-4Q 2018
- Move forward on ongoing collaborative and “coalition of willing;” pilot test approaches
- Policy advocacy in Congress and executive branch; CMS/CMMI
- Rural areas a priority

How to Join Our Efforts

- Email us!
- Susan Dentzer, President and CEO, NEHI
- sdentzer@nehi.net
- Lauren Choi, Vice President for Policy Partnerships, Development, and Membership at NEHI
- lchoi@nehi.net

The End