



Health Care Without Walls: A Future of More Distributed Care

By Susan Dentzer, President and CEO, NEHI

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This Presentation At A Glance

- **Multiple drivers of change in today's health care system**

  - **Insurance coverage expansion; population growth**
  - **Poor health of population and focus on upstream contributors to health**
  - **High cost of system and need for more sustainable rate of spending growth and affordability for consumers**
  - **Ongoing need to improve quality and efficiency**
  - **Payment and delivery system reforms**
  - **Political uncertainties**

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This Presentation At A Glance

- **At the same time, multiple forces of disruption**
  - **Dramatic advances in science and technology, changing our understanding of disease and how to treat it;**
  - **New locations and methods of care, outside of institutions;**
  - **Consumerism, "retailization," and greater transparency around costs, pricing, quality**

What do these trends mean for you?

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First…a story

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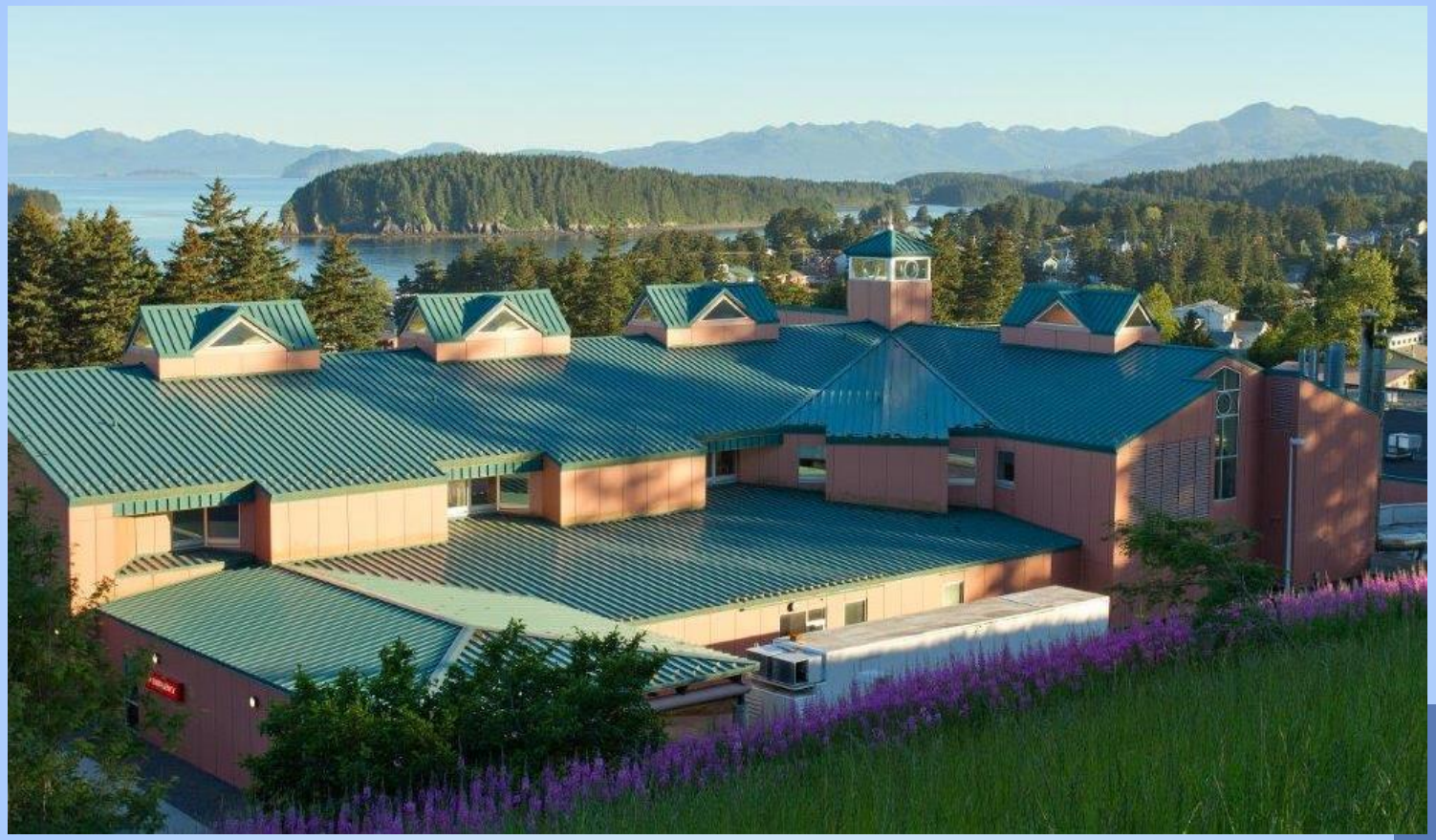

Providence Kodiak Island Medical Center

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Memorial Sloan Kettering Cancer Center, New York

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Clinicians, MSK, New York

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

Dave's options:

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

DAVE

Tumor tissue genetically sequenced

Telehealth consultation with oncologist
Dr. Fred at MSK

Digital images sent

Artificial Intelligence-enabled treatment review & consultation

Targeted therapeutic agent e-prescribed and dispensed from Seattle specialty pharmacy

Agent delivered by drone to critical access hospital on Kodiak

We've come a long way from the Good Old (Really old) Days

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And from the more recent Good Old Days

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

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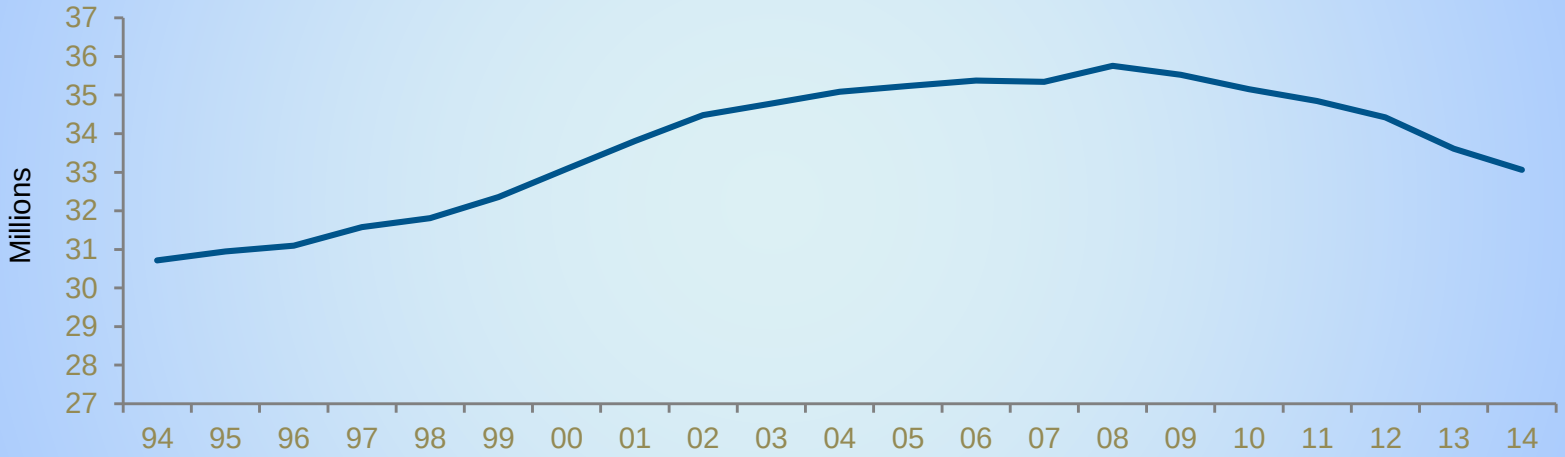
Current Trends

Declining Inpatient Use: Admissions in Community Hospitals, 1994-2014



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

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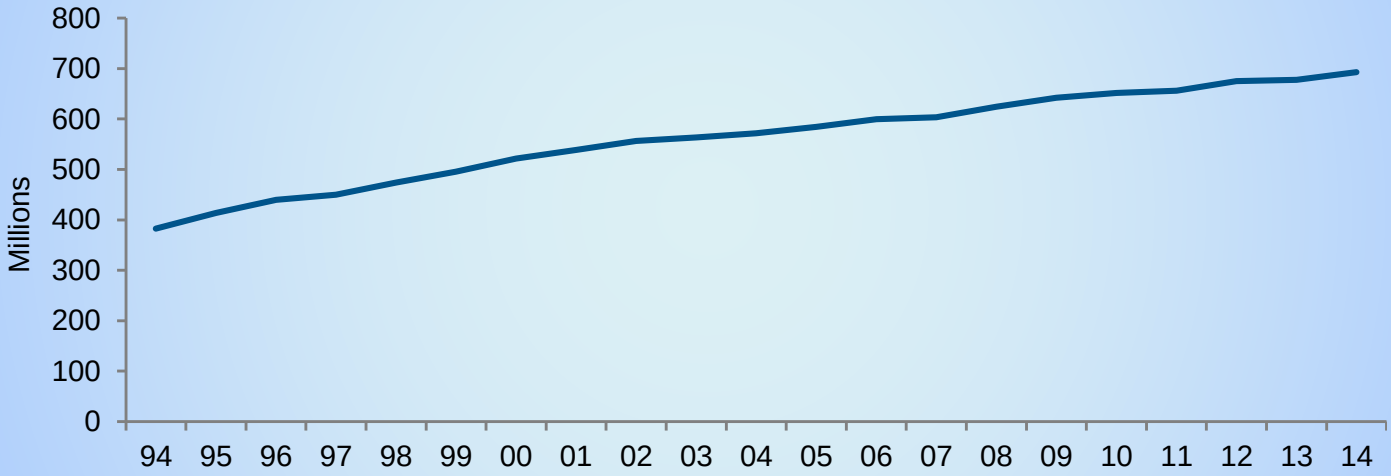
Rising Outpatient Use: Outpatient Visits In Community Hospitals, 1994-2014



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

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What's driving trends of distributed care?

#1: THE MOVE FROM VOLUME TO VALUE

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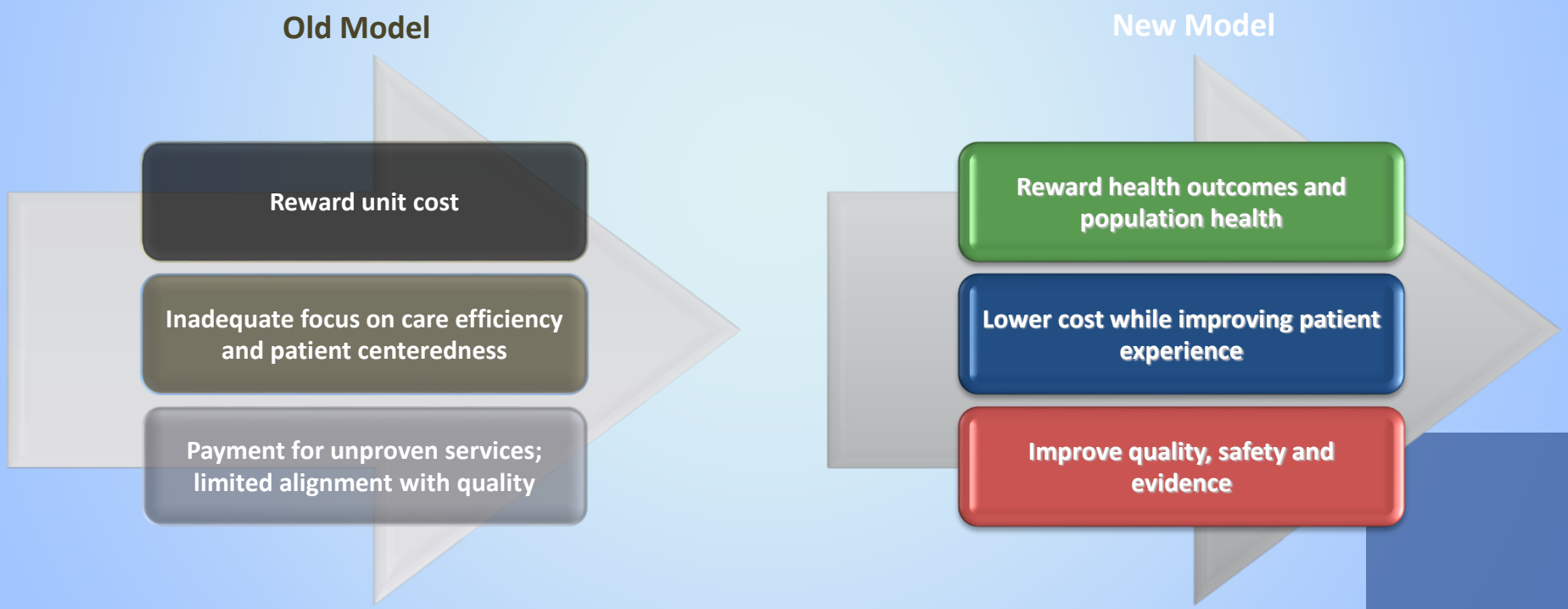
Goals of payment and delivery system innovation: Improving value and affordability



High health care costs and Consumers' grim finances

- **Just under 1 in 4 US adults not able to pay all of their current month's bills in full.**
- **2 out of 5 adults say they either could not cover an emergency expense costing $400, or would cover it by selling something or borrowing money**
- **Somewhat better news than in 2013, when 1 in 2 said so**
- **1 in 5 adults had to pay a major unexpected out-of-pocket medical expense in the prior year**
- **1 in 4 report forgoing one or more type of health care in the prior year due to affordability**
- **About 1 in 10 U.S. adults are carrying debt from medical expenses that they had to pay out of pocket in the previous year.**

Source: "Report on the Economic Well-Being of U.S. Households in 2016," the U.S. Federal Reserve System Board of Governors, May 2017

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#2: POOR HEALTH OF POPULATION AND FOCUS ON UPSTREAM DRIVERS OF "POPULATION HEALTH"

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Poorer health: US life expectancy outlook

- US life expectancy at birth already lower than most other high-income countries and has stalled or fallen in some population subgroups
- In 2030 US life expectancy estimated to be similar to Czech Republic for men, Croatia and Mexico for women
- US has highest child and maternal mortality, homicide rate, and body-mass index of any high income country
- US was first of high-income countries to experience halt or reversal of increase in height in adulthood, associated with greater longevity
- US is only country in OECD without universal health care coverage
- US has highest share of unmet health care needs due to costs

Source: Kontis V et al, "Future Life Expectancies in 30 Industrialised Countries: Projections with a Bayesian Model Ensemble,." *The Lancet*, published online, Feb. 21, 2017

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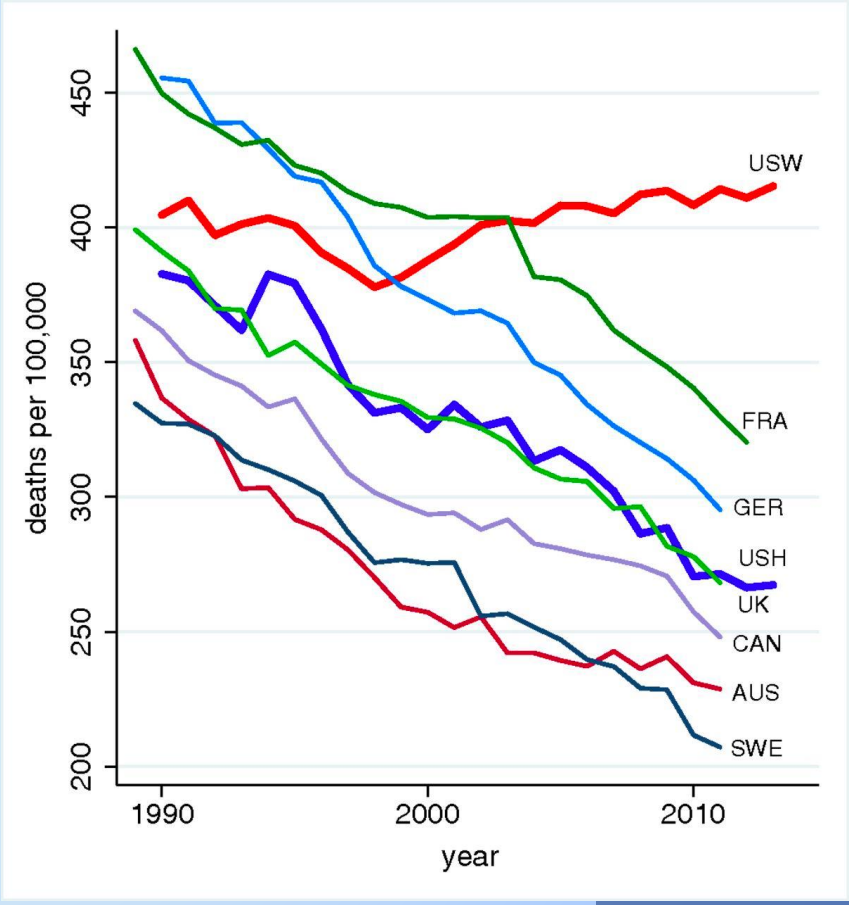
Rising morbidity and mortality in midlife

- Estimated 500,000 lives lost 1999-2013 in U.S. due to rise in all-cause mortality of middle-aged, white, non Hispanic men and women
- Increasing death rates from drug and alcohol poisonings, suicide, chronic liver diseases, cirrhosis
- Biggest mortality increases among those with least education
- Morbidity: self-reported declines in health, mental health, ability to conduct activities of daily living; increases in chronic pain and ability to work



Source: Anne Case and Angus Deaton, Proceedings of the National Academy of Sciences, vol. 112 no. 49, 15078-15083

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Understanding what drives overall health status

Source:
www.countyhealthrankings.org

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#3: INNOVATION IN HEALTH CARE DELIVERY

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Health Care Goes Retail

Services and Costs

Minor illness exam	$62
Minor injury exam	$62
Skin condition exam	$62
Wellness & prevention	$20-$66
Vaccinations	$30-$112

Additional charges may apply. Most insurance accepted. Contact your insurance company to verify coverage.

- **Recent evidence suggests retail care isn't replacing hospital ED use – yet**
- **For now, retail use is additive to hospital use; will trend change?**

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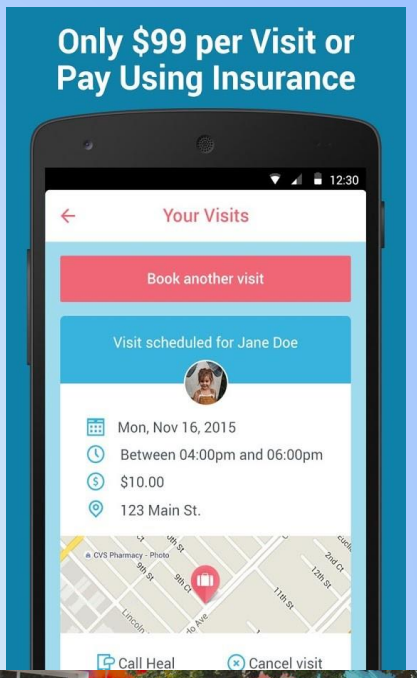
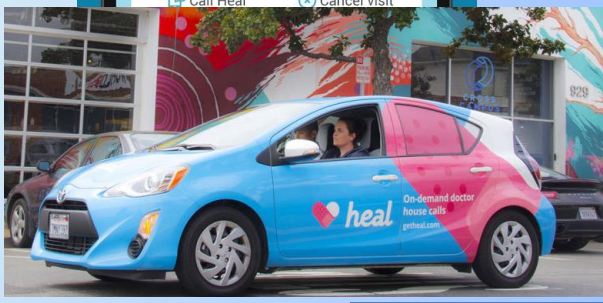
Return of the House Call

- Fueled by increasing desire by consumers for on-demand services
- Providers include companies such as Heal, Pager, Curbside Care
- Heal: a tech startup cofounded by Nick Desai and his wife, Renee Dua, a physician, after a 7-hour wait in an ED with their sick infant son
- Now operating in Los Angeles, Orange County, CA, and Washington, DC; plans to be in Florida, New York, and Texas by end of 2017
- Via an app, a home doctor's visit can be scheduled in under an hour; costs $99 for those without insurance; otherwise company works with coverage
- Heal physicians see average of 14 patients/day – slightly less than average for US family physicians





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Uber Health

- Uber now has a unit called Uber Health.
- A pilot run over the last two years enabled people to summon an Uber car with a nurse, who would come to a setting where at least 10 people were assembled to administer flu vaccines.
- Uber also rolling out a “doctor on demand” service in multiple markets

Micro-hospitals

- 24/7, small-scale inpatient facilities—around 15,000 to 50,000 square feet
- Eight to ten inpatient beds for observation and short-stay use
- No two micro-hospitals exactly the same in their design or service mix
- Entry points into markets where demand would not able to support a full-scale hospital - or...
- Located 18-20 miles from full-service acute care hospital – transfers for patients staying more than 48 hours possible
- Costs $7 million to $30 million – fraction of full hospital ($400 - $1200/square foot; new building at Johns Hopkins = 1.6 million square feet)
- Systems building them include Dignity Health, SCL

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#4: TECHNOLOGY

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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

New Medical Technology: The Smart Phone

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Transformation of care in health systems, today and tomorrow

- Predictions in some systems that ½ of patient "encounters" could take place over a smart phone
- Potential enormous: e.g., handheld ultrasound; point of care cancer screening; sensors able to identify volatile organic compounds (VOCs) commonly associated with lung cancer

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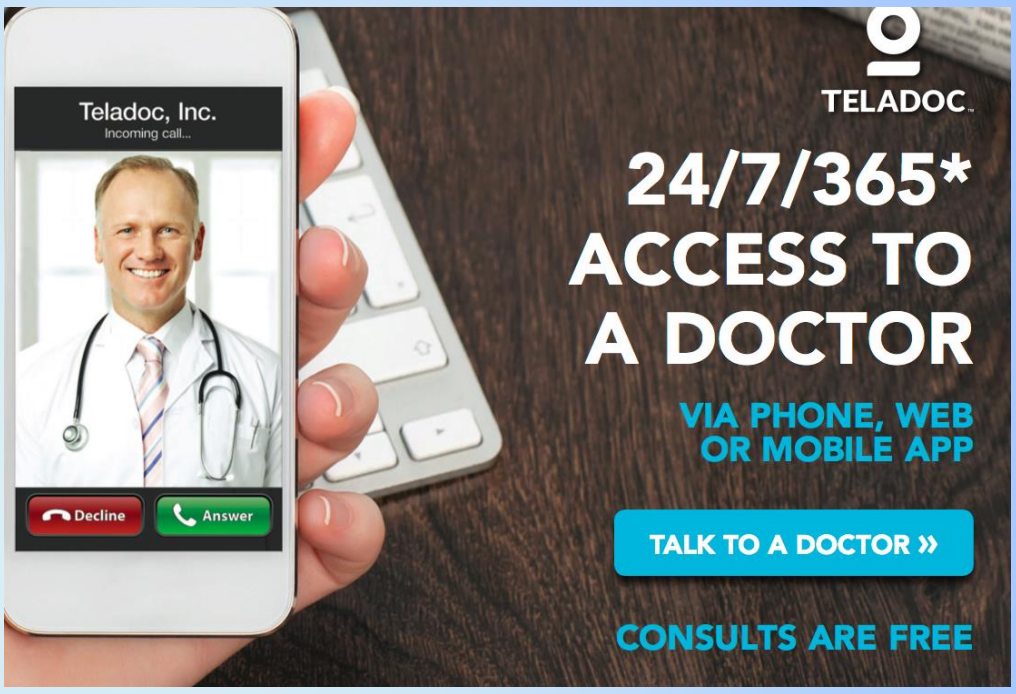
Telehealth

- Example of Teladoc, the largest company providing telehealth services
- Out-of-pocket charges for a visit are $45
- Working with CVS on telehealth via CVS's retail clinics
- CVS developing a smart phone app that could enable an individual to arrange a telehealth appointment
- 1.5 million patients seen to date.



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Telehealth and senior care

- LivingWell@Home – service of Evangelical Lutheran Good Samaritan Society aimed at seniors in independent living
- Remote sensors to track sleep and activity patterns; telehealth technology to track blood pressure, pulse, weight, oxygen and glucose levels
- Registered nurses and data specialists monitor data 24/7
- In partnership with a Minnesota primary care provider, reduced hospitalizations by 86.7%, according to estimates

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Other technologies: 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 from Beverly, 25 miles northeast of Boston, to Children's Island, a summer camp for children three miles off the Atlantic coast.
- Drone made the journey in about 8 minutes

Artificial Intelligence

- **"Today, the AI business, experts say, resembles the internet in the mid-1990s: a thing on its own that will eventually be built into all kinds of products and services."**
- **--*New York Times*, Oct. 17, 2016**

- Artificial intelligence: a machine mimics cognitive functions that humans associate with other human minds
- Examples: Understanding human speech; interpreting complex data
- Machine learning: study and construction of algorithms that can learn from and make predictions on data
- Cognitive computing: simulation of human thought processes in a computerized model; self-learning systems that use data mining, pattern recognition and natural language processing to mimic brain
- Artificial neural networks: computational models that solve problems as a human would

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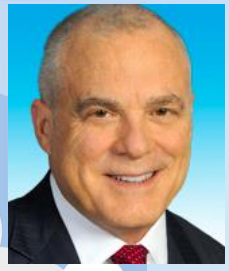
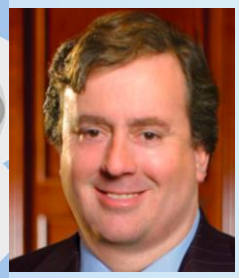
Innovations among payers/health services: Aetna





Mark Bertolini (top), Aetna's Chairman and CEO; Gary Loveman, executive vice president

- Technology and logistical capability exists "to create a self-curated experience for each individual in developing their own journey in health."
- 5G wireless technology will be 100-200 times faster than 4G and increases network expandability exponentially
- --EHR and other data can follow patient on an app

--Most care delivered in home and "failure" is care provided anywhere else

- "Payer" becomes platform to connect patient to most appropriate providers; health insurance evolves into ….???

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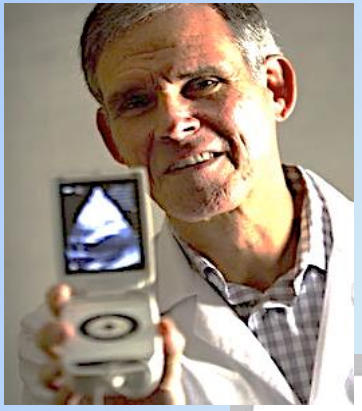
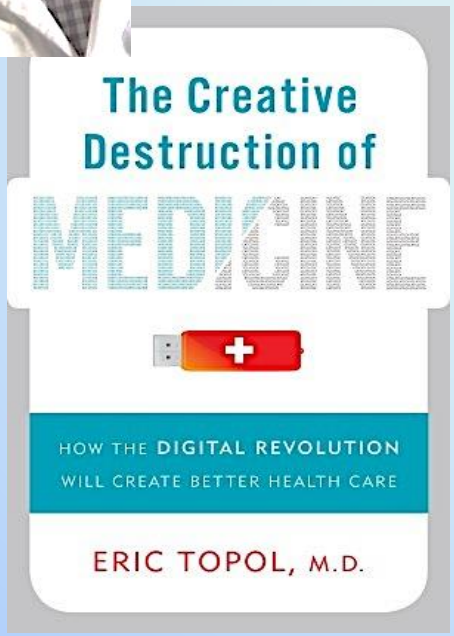
Disruptive Technologies





- Telehealth, digital health, mhealth (mobile), apps
- Pushing care out of institutions and into homes and offices
- Enabling more self care
- Engaging patients and enhancing sense of knowledge, confidence, activation

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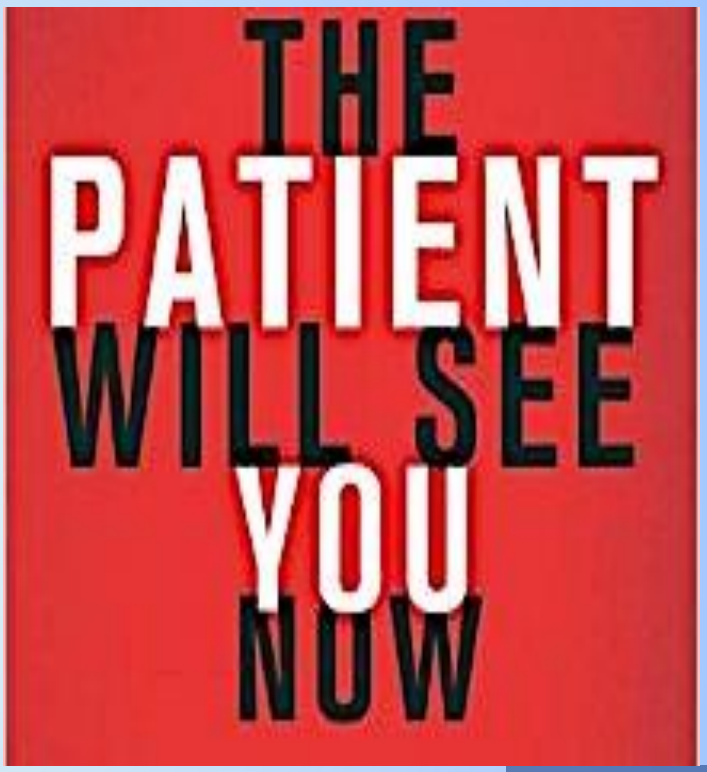
The Digital Health Explosion

- 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
- "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



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Google

amazon.com

Recent tech entrants into health care…who's next?

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Qualcomm "Tricorder" XPRIZE winners, April 2017

- Competition to create a portable wireless device that could accurately diagnose 13 health conditions and capture five vital signs
- Named after Star Trek "Tricorder" – fictional multifunction hand-held device for sensor scanning and data analysis
- More than 300 teams competed; winner was Final Frontier Medical Devices
- Device = collection of sensors and artificial intelligence engine
- Commercial market deemed large enough to support 2 XPRIZE winners

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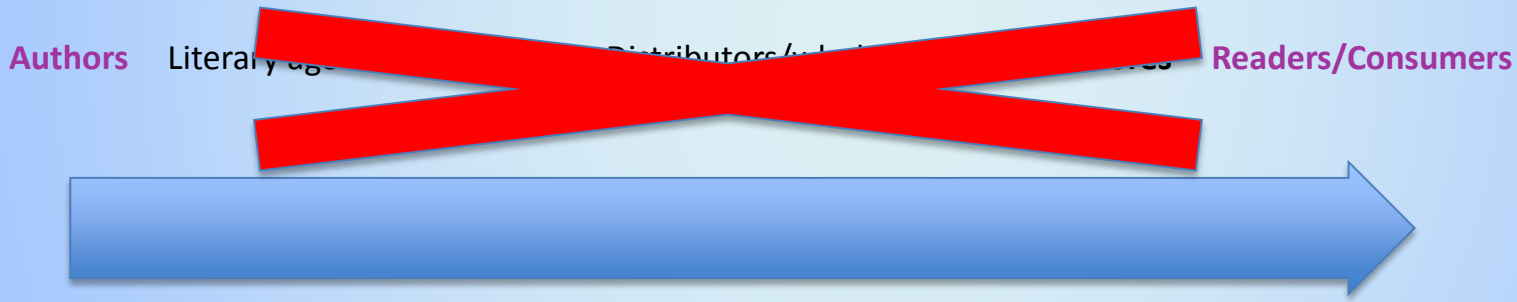
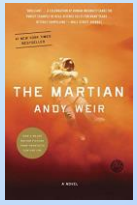
The Tech Sector's Disruption Mindset: Example of Amazon

- **Evaluate the "value chain," as in book publishing**
- **Only two key elements of chain: producers and consumers**
- **Address their needs and eliminate everything else that is grabbing "value" along the chain**



Author Andy Weir 

Self-publishes Kindle version of *The Martian* 

Sells 35k copies in 3 months; book goes on to be *New York Times* best seller & movie

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Amazon: Moving into Health Care?

- In November 2016 launched a one-hour delivery service for non-prescription items from a pharmacy chain in Seattle, as well as in Japan
- Has reportedly held meetings to determine whether it should go wholly into pharmacy business
- May 2017: Amazon hired Mark Lyons, formerly of Premera Blue Cross, to create an internal pharmacy benefits manager for Amazon employees
- Are other health care ventures to come?

How are health systems responding?

Some case examples

Mount Sinai Health System, New York

- **Until past several years, system's priorities were neurosurgery, cardiac care, and "filling beds"**
- **Launched ACO initiatives under both Medicare and commercial and related innovations**

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"Hospital at home"

- "Hospitalize" patients at home for conditions that are often treated as inpatient cases – e.g., pneumonias – with care from visiting physicians, nurses, others
- Developed at Johns Hopkins; tested in among other places Presbyterian Health Services, New Mexico; Mount Sinai health system, New York; Partners HealthCare, MA; Center for Medicare and Medicaid Innovation Grant
- Research shows 19 percent decrease in mortality; better functional outcomes for patients; better receipt of medications
- Variable costs per stay are $1000-$2000 lower = 19%; patient satisfaction mean score = 90.7%

Johnny Baker, then 49, COPD patient in "Hospital At Home" program at Presbyterian Health Services, NM

Sources: :Caplan et al, L. A meta-analysis of "hospital in the home." *Med J Aust*. 2012;197(9):512-519. Also Cryer et al, "Cost For Hospital At Home Ptients Were 19 Percent Lower, With Equal or Better Outcomes Compared To Similar Patients,"*Health Affairs*, June 2012

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Mount Sinai Health System's "Hospital at Home Plus" and "Observation Unit at Home" Initiatives

- Average 80 year-old in US makes at least one visit per year to an ED; 50% will be admitted, of whom 40% will end up in post-acute setting and 20% will receive home care = huge cost to system & patient
- Mt. Sinai's Medicare Innovation 3-year demonstration project (ended 8/17): 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

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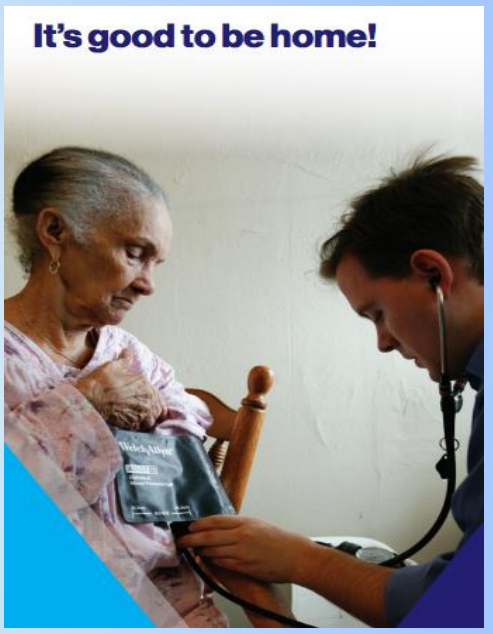
Mount Sinai Health System's "Hospital at Home Plus" Initiative

- Once "hospitalized" at home, patients receive daily visits (or more often if needed) from a doctor or nurse practitioner
- Home care nurses to check vital signs regularly and administer certain medications, including infusions
- Lab services, IV medications, and other equipment or therapy brought directly to the home
- On-call service 24 hours a day, seven days a week to respond to any urgent or immediate needs
- A social worker to coordinate care and develop a follow-up plan



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Mt. Sinai Health System's "Hospital at Home Plus" Initiative

- Once "hospitalized" at home, patients receive daily visits (or more often if needed) from a doctor or nurse practitioner.
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- On-call service 24 hours a day, seven days a week to respond to any urgent or immediate needs.
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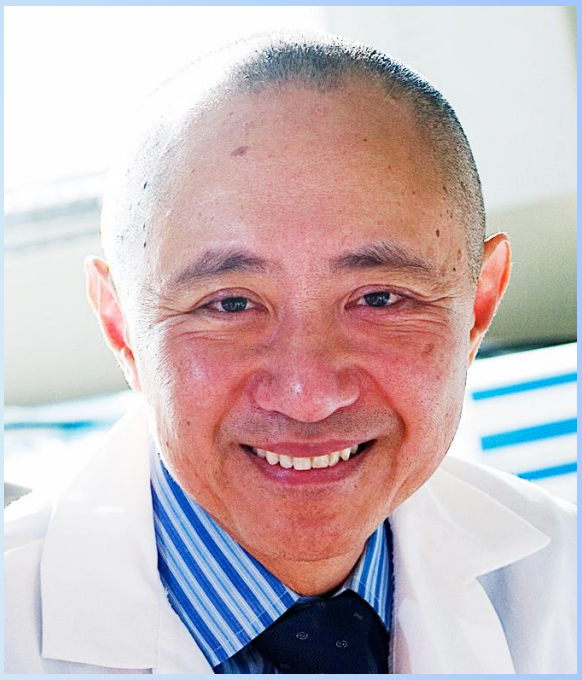
Results: Mt. Sinai Health System's "Hospital at Home Plus" Initiative

- "Hospital at home" episodes typically followed with "light touch" medical care for post-acute period
- Palliative care patients are transitioned to hospice
- Brick-and-mortar readmissions within 30 days reduced by half
- Very high patient satisfaction
- Only 7 percent of patients are "escalated" back to hospital – 1/3 of time at family's request
- Permanent payment models now in place with several commercial payers; also likely physician-focused payment model under MACRA/Medicare



Albert Siu, MD oversees program & is Professor, Icahn School of Medicine at Mount Sinai

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Kaiser Permanente: What if System Were Built Today?

- Kaiser's 10.1 million (today 12 million) enrollees had 110 million interactions with clinicians in 2015
- More than half were virtual – e-visits, emails, phone calls, kiosks
- More than 23 million e-visits alone in 2015
- Projection: By 2020, e-visits will exceed in-person visits

- Bernard Tyson, CEO, Kaiser Permanente
- "If I were building Kaiser Permanente today, I would build it on the back of technology."
- What if you "never had to step out of the 21st century to get what you need from Kaiser Permanente"?

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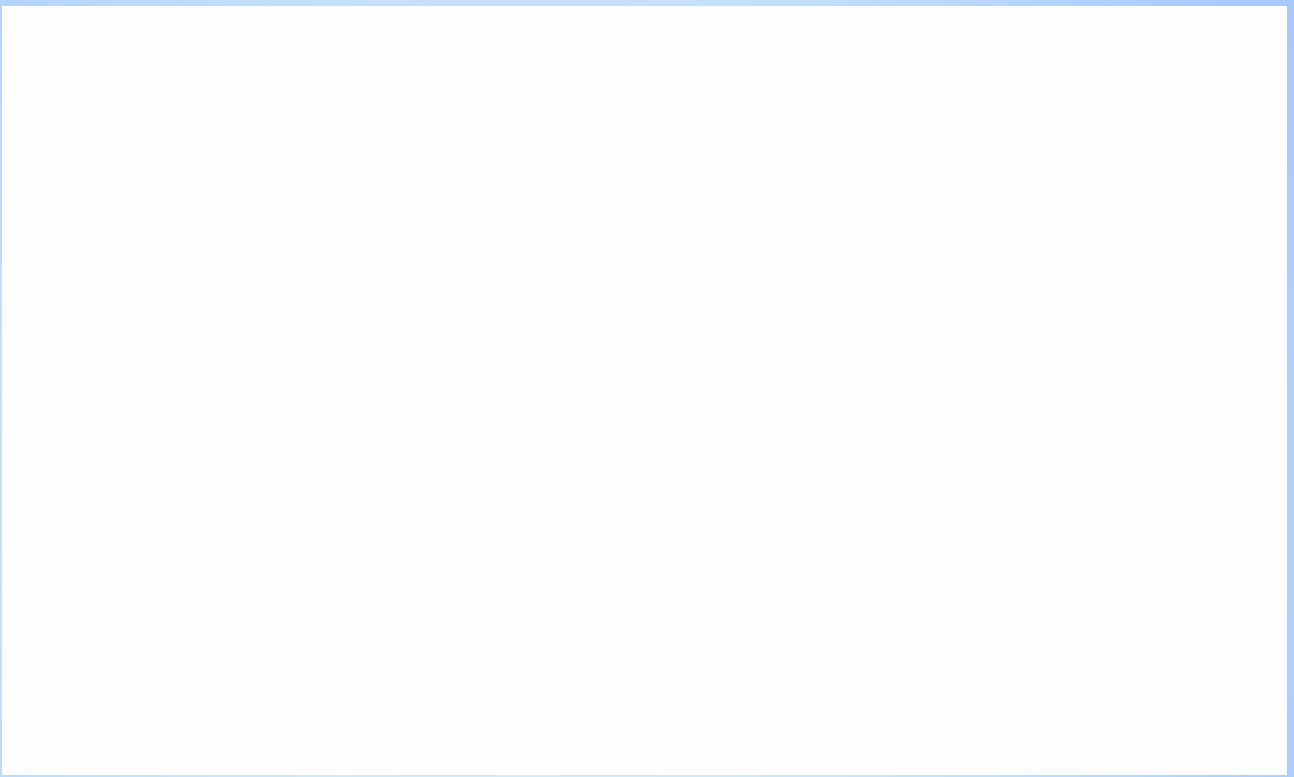
Innovations at Kaiser Permanente

- Garfield Innovation Center
- “Imagining Care Anywhere”



Population Health at Kaiser Permanente: Start By Asking People About Social Needs

- With California's Medicaid rates among lowest in nation, how to deliver care at Medi-Cal rates, and not tier the care?
- At Kaiser Permanente, 1 percent of patients account for 20 percent or more of resources; 4/5 are on Medicare or Medicaid
- Average annual cost $98,000-plus – not super utilizers but "the vital few"
- In pilot KP called 5,000 members in Southern California region to ask them about 12 domains of social determinants
- Each has average of 3.5 unmet needs; typically financial needs, food, caregiver support
- Prevented one woman's repeat hospitalizations with a $60 handrail

Nirav Shah, MD, Senior Vice President and Chief of Clinical Operations for Kaiser Permanente Southern California region

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Providence St. Joseph Health System

- 50 hospitals, 829 clinics, 16,000 caregivers, 1.9 mill covered lives in health plan, 14 supportive housing facilities
- Rod Hochman, MD, President and CEO (upper right), initially hired 12 people from Amazon to revamp web site; now more than 120 on team from Amazon and Microsoft, including executive vice president Aaron Martin (lower right)
- Attitude of new arrivals? They were "shocked at our lack of consumer focus."

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Ongoing Innovation: Providence

- Digital platform focus: “We want to make care available everywhere”
- Via Health eXpress telehealth platform, will do 140,000 virtual visits this year
- Home visits available with clinicians dispatched via Uber
- Employers, e.g. Intel, eager to avoid employees’ time away from work; considering health kiosks at work sites
- Relentless focus on consumer: “Circle” engagement app encourages mothers post-partum to stay with Providence providers; now 60% do vs. 27% previously

Providence St. Joseph Health

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Connected Care at Dartmouth-Hitchcock and Allied Regional 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

Dartmouth-Hitchcock

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What If More Systems Attempted Distributed Care?

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The Potential

- 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

Reaching outside the hospital walls

- Addressing social issues in communities such as hunger, lack of transportation, housing insecurity
- Meeting patients where they are – including at home – via technologies including telehealth and smart phones
- More efficient care delivery models?
- What payment models support these?

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The Obstacles

- 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; absence of national licensure
- Data privacy and security; HIPAA and state statutes
- Lack of high speed broad band access, internet connectivity in much of country

Will Federal/state policy changes affect the trend?

- Multiple uncertainties in federal policy
- Thrust of Maryland all-payer waiver arguably very supportive
- Trump administration embrace of Medicaid waivers could accelerate change
- Pressure to make health care even more affordable could push more care out of institutions

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The Consequences

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Conclusions

- Trend toward distributed health care outside of conventional institutions
  - "Health Care Without Walls" – is real
- Pace of change probably steady but scope uncertain
- Much dependent on regulation, payment policy, human factors and work force constraints, not technology