

The background of the slide features a blurred image of a healthcare professional wearing a blue surgical cap and a white face mask. Overlaid on the right side is a graphic with the word 'ONCOLOGY' in large white letters on a dark blue background. Below this, there is a grid of colorful squares containing various medical icons: a DNA helix, a microscope, a heart rate line, a caduceus, a stethoscope, and a cell. A hand is shown interacting with one of the squares. At the bottom right, a green heart rate line is visible.

Disruptive Innovation in Cancer Care: Implications for the Future Care Work Force

Presentation by Susan Dentzer
Visiting Fellow, Duke-Margolis Center for Health Policy
To the National Cancer Policy Forum Workshop
February 12, 2019

This Presentation at a Glance



- Envisioning the Future of Cancer Care: One Potential Scenario
- Technology trends and the changing health care delivery platform
- Addressing barriers and building the ecosystem to support innovation
- Implications for work force

HEALTH CARE WITHOUT WALLS

A Roadmap for Reinventing
U.S. Health Care

Susan Dentzer, Editor



A story









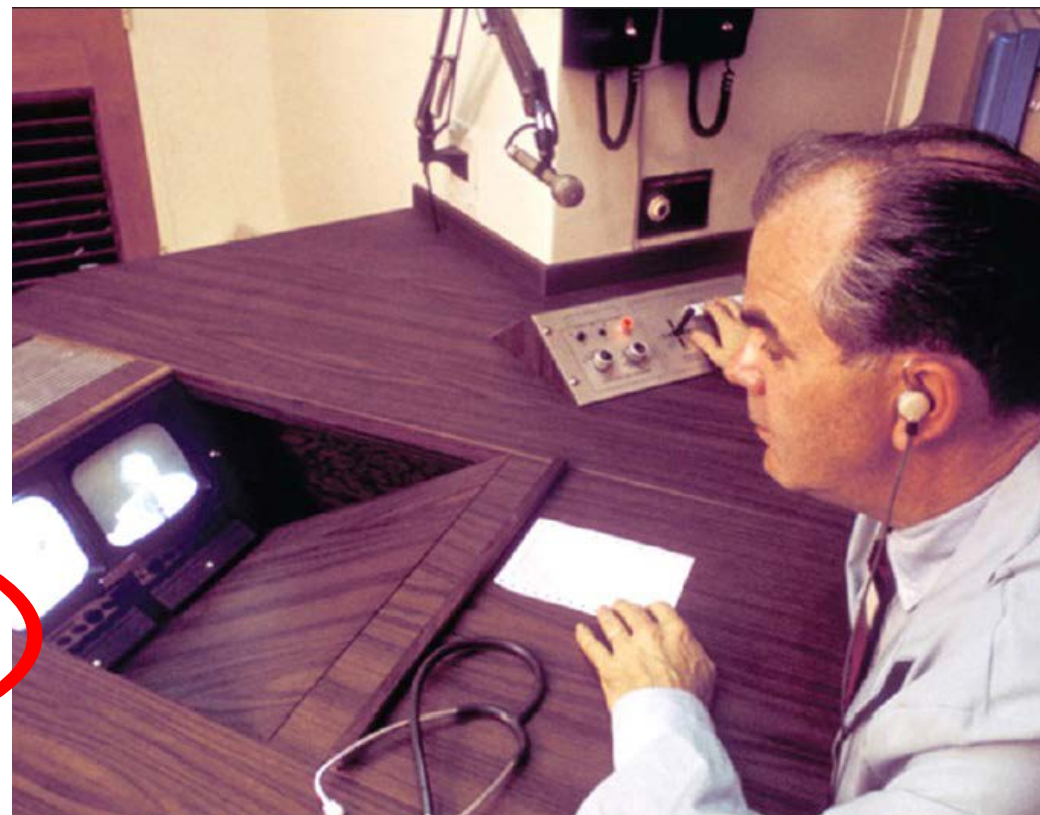
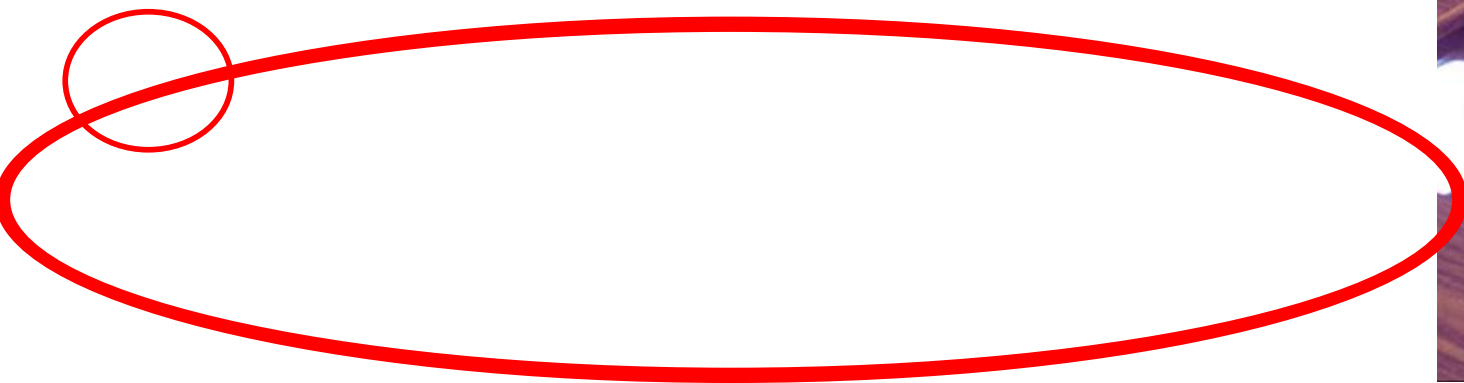


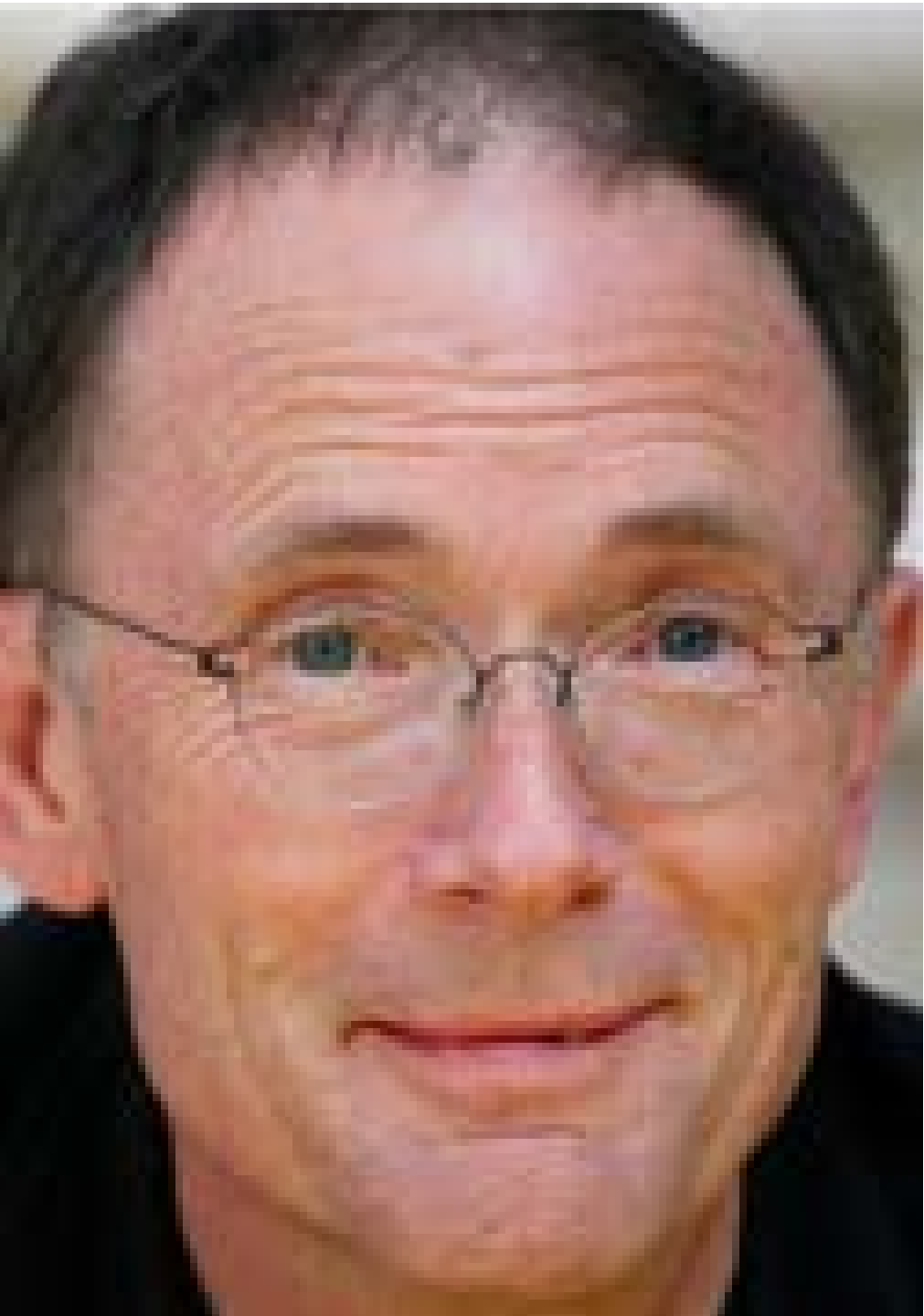


Why do we have “Star Wars” medicine on a
“Flintstones” delivery platform?

Shouldn't we at
least advance to
"The Jetsons?"
(1962)







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”



figure1



Share your findings with the
medical community

"We developed Figure 1 so members of the healthcare community could share images, knowledge, and clinical insight with each other, while keeping patient privacy safe."

Joshua Landy, MD, Co-Founder



Available on the iPhone
App Store



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 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



JAMA

- Although telemedicine use increased substantially from 2005 to 2017, use was still uncommon by 2017.”
- “Users of primary care telemedicine were **younger** on average...[and] more likely to reside in **urban** areas”
- “There was a **rapid increase in growth for primary care telemedicine in 2016 and 2017** after coverage for direct-to-consumer telemedicine expanded.”
- “The brisk adoption of telemedicine **may reflect consumers seeking convenience** rather than primary care supply”



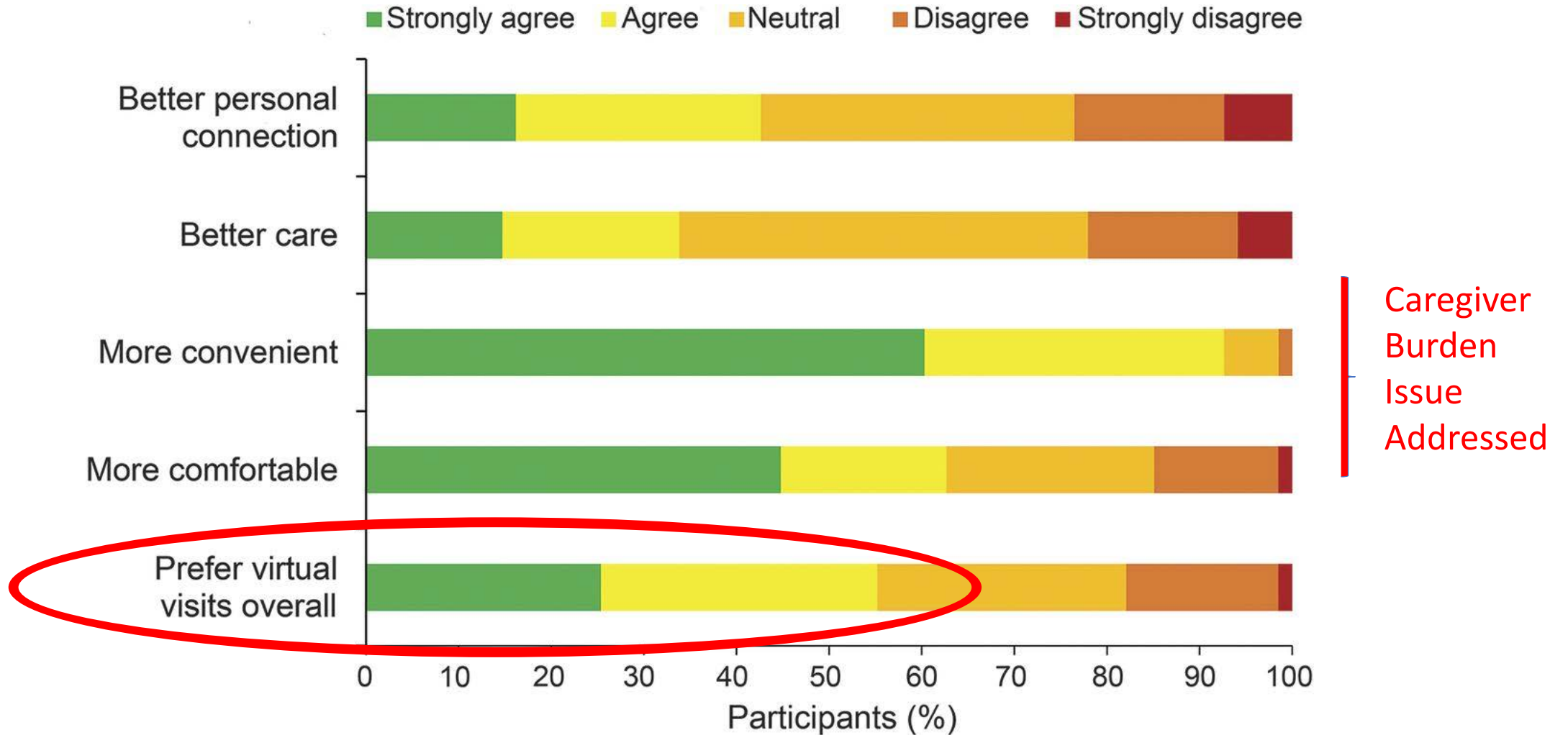


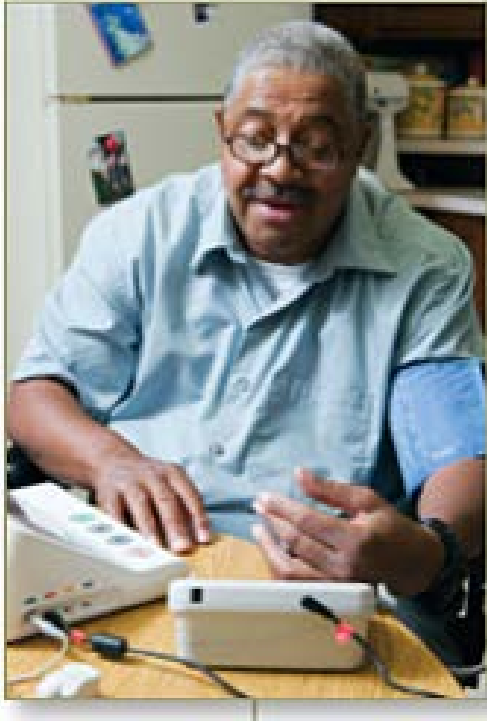
"We're trying to bring care to
patients, wherever they are,
right on their phones."

Dr. Ray Dorsey, University of Rochester



Patients' satisfaction with virtual visits





TeleHealth Program

Helps Vets Stay Healthy and Independent



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 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



- A University of Arizona Medication Management Center spin-off company (now owned by Tabula Rasa Rx)
- Based on MTM techniques and software originally developed by researchers and faculty at the University of Arizona's College of Pharmacy
- Worked with Ohio State's College of Pharmacy to launch medication management telehealth program in 2014; also now collaborating with University of Texas at Austin's College of Pharmacy
- MTM via videoconference especially helpful for elderly patients with transportation issues in particular





Patient-Centered Outcomes Research Institute Studies Underway

- Effectiveness of video visits versus in-person visits with palliative care provider for patients with advanced lung cancer
- Effectiveness of a mobile app in improving oral cancer therapy medication adherence and symptom management

Machine Learning/Deep Learning Applications in Pathology and Radiology

- Deep learning network at Case Western Reserve University: 100 percent accuracy in identifying presence of invasive forms of breast cancer in pathology images.
- Machine learning system at Indiana University-Purdue University: 100 percent accuracy when asked to predict remission rates for acute myelogenous leukemia
- Google, 2017: machine learning system identified images of metastasized breast cancer with 89 percent accuracy, versus 73 percent for human pathologists
- Stanford, 2017: machine learning system outperforms radiologists in diagnosis pneumonia





Plethora of Technologies in Use Now, And More Coming

- Telehealth and telemedicine; remote monitoring
- Software, such as SaMD (software with a medical purpose)
- Data and information exchange, including via electronic health records
- Clinical decision support systems
- Artificial intelligence, cognitive computing, machine learning, deep 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

Technologies and Services We've Heard About at this Meeting That Could be Brought to Bear on System

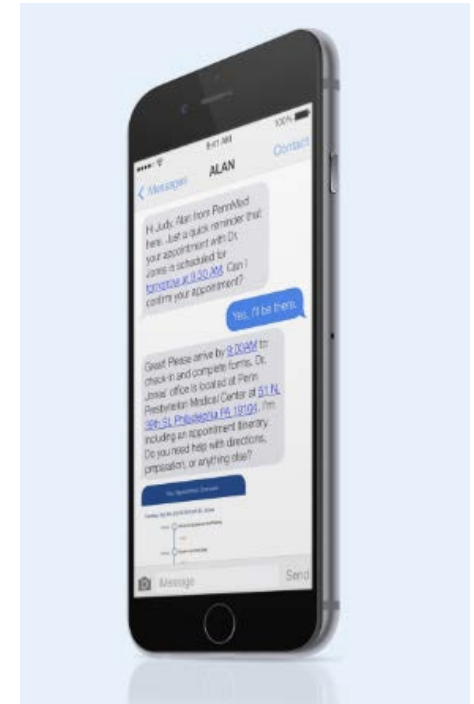


Symptom Care at Home

A Comprehensive and Pragmatic Pro System Approach to Improve Cancer Symptom Care

Mooney, Kathi, PhD, RN, FAAN⁺; Whisenant, Meagan S., PhD, APRN⁺; Beck, Susan L., PhD, APRN, FAAN⁺

Patient.ly



It's Not Really All About the Technology

- It's about using the technology to put people and health systems together in new ways



What is the potential of more distributed care?

- Drastically increase care convenience
- Increase access, especially in underserved areas
- Leverage and extend existing provider base; improve labor productivity
- Universalize and democratize knowledge and expertise
- Reduce unnecessary “friction” in system – e.g., lost productivity for patients, 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



Any Downsides?

- Human factors considerations –
e.g., for aged and disabled in particular?
- Privacy and security concerns?
- Disruption to existing business models and entities?
- Other?



Multiple Obstacles To Overcome

- Inertia: systems have to change
- Lots of sunk costs in existing plant and capital
- Need for new payment models to support optimal care
- Need for a different or differently trained work force; more emphasis on teams
- State laws and regulations still impede activities such as telehealth – e.g., on licensure and scope of practice in particular
- Data privacy and security; HIPAA and state statutes
- Lack of high-speed broad band access, internet connectivity in much of country



Recommendations



Technology

- “Health Care Without Walls” technologies should have common elements, including usability across many different types of patients and transparency around underlying digital coding and algorithms
- A public-private initiative should be launched to guide health systems in acquiring most cost-effective technologies
- Technology developers and purchasers should predicate all technologies on interoperability, seamless data and information exchange, and data accessibility within appropriate privacy and security safeguards



Payment

- New payment models must be developed to facilitate adoption of more distributed care approaches and encourage substitution of virtual care for physical care, rather than simply an add-on
- Patients should be directly incentivized to take up virtual technologies linked to improved health outcomes



Regulatory

- Many regulations at federal, state and local level were tailored to older models of health care delivery and should be overhauled
- Scope of practice laws and regulations sorely outdated; all providers should work at top of their licenses
- Federal government should create parallel national licensure of health care professionals that states could opt into
- U.S. should aim for a single overarching privacy and security regime, such as Europe's General Data Privacy Regulation, and one overarching regulatory agency
- U.S. should adopt goal of universal, affordable, high-speed broadband and 5G; federal government should lead investment



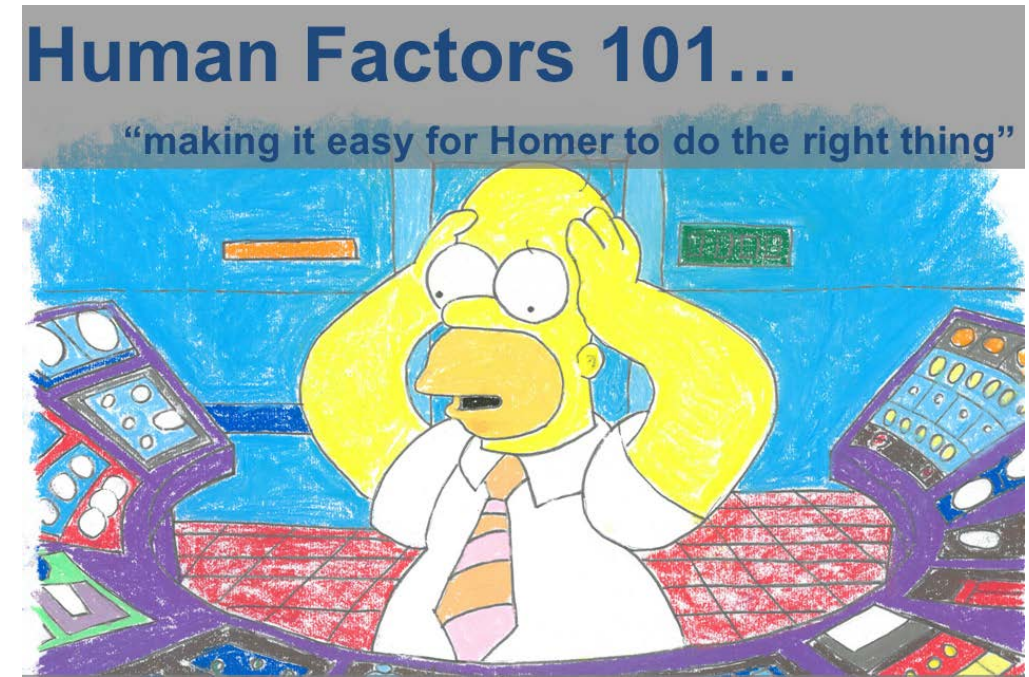
Work Force

- Existing work force projections are essentially meaningless because they do not take technological change into account; improvements needed
- Changes in care delivery should provide opportunity for more cost-effective use of labor (arguably the highest cost input into health care)
- New types of workers needed to provide care in communities and support use of technologies by patients
- Many of today's workers will need retraining and continuing education to operate in more virtual care models, and training of tomorrow's workers should be revamped accordingly



Human Factors

- Technologies for use in health care should be created via “human centered design” principles; developers should adopt voluntary standards
- Regulatory agencies such as Food and Drug Administration should employ carrot-and-stick approaches to encourage consideration of human factors in development of new technologies
- Health care organizations should integrate human factors expertise and human-centered design principles into their strategy and operations operations





THE END