Exploring the Next Frontiers of Health Tech Innovation

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Dispatch From a Broken Healthcare System

- On September 1, 2017, Kathy Halamka receives the following letter from Harvard Pilgrim Healthcare (the #1 HMO in the US)
- “We are denying coverage for your ongoing cancer care because we found a paper published 27 years ago that suggests a different treatment is better”
- The responsible physician for making this decision is Larry, a retired psychiatrist who is licensed in New Hampshire
- “We have not reviewed any of your records, your protocols, or your preferences”
- You can appeal this process by managing an appeal process over months, managing a project across numerous providers, a board of payer experts, and the medical literature.

How it Should Have Worked

- A cloud hosted precision medicine service provider curates the literature and not only provides a library of evidence but grades the evidence for accuracy/impact/relevance
- EHRs use the FHIR Clinical Decision Support Hooks to send salient patient data to the cloud. Clinicians receive guidance showing possible treatment choices and objective rankings of safety, quality, efficiency, cost, and availability
- Clinicians and patients have a discussion and via shared decision making develop a care plan
- Open source apps are used to display care plans, patient generated healthcare data, and patient report of outcomes
- The payer “gold cards” this process

Emerging Trends

- The rise of app stores/third party tools that layer on top of electronic health records.
- Work on the infrastructure that will accelerate data sharing - nationwide patient matching strategy, electronic provider directories, data governance/policy frameworks
- The urgency to reduce costs as part of the move from fee for service to value-based purchasing
- Reduced pace of government regulatory efforts
- The leadership of the private sector

The Problems to be Solved

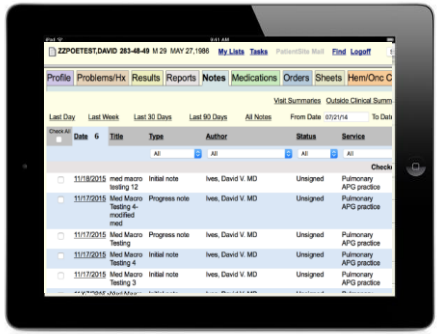
- Ever increasing healthcare costs in an aging society
- Poor tools for patients and families to navigate the healthcare system
- Caregiver burden with EHRs
- Lack of enabling infrastructure to exchange data
- Significant variations in healthcare quality

Examples

- EHR - my wife's thyroid issues and the need for "social" precision medicine
- Patient/Family engagement - my recent hypertension diagnosis and "internet of things" precision medicine
- Big Data Analytics - my wife's cancer experience and "clinical trial of one" precision medicine

Patient and Provider Mobile Apps

Clinician Apps



Inpatient Med Lists

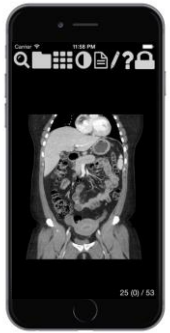
PatientSite

Patient Questionnaires

Dragon Medical Recorder

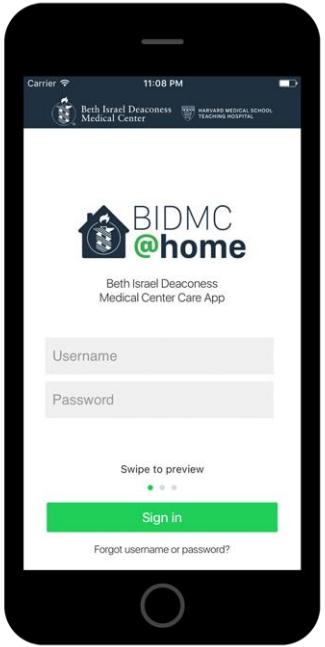
LifeImage Mobile

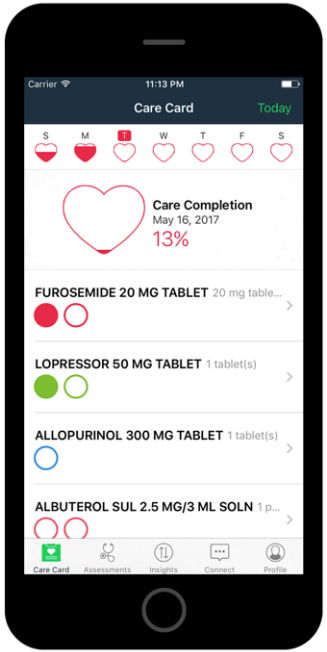
eyeRad

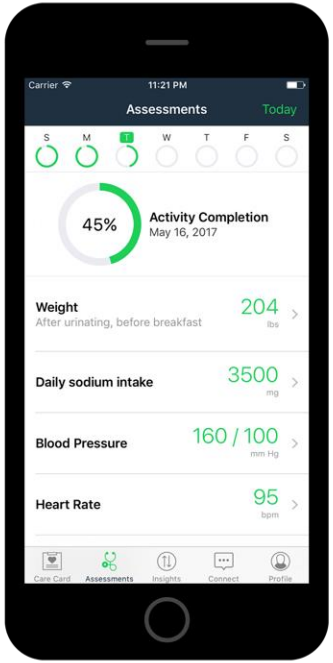


MyICU

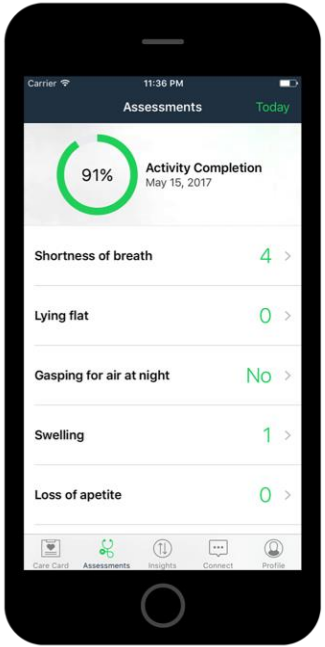
BIDMC@Home

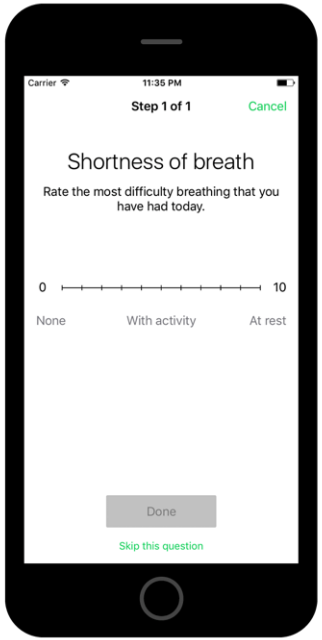


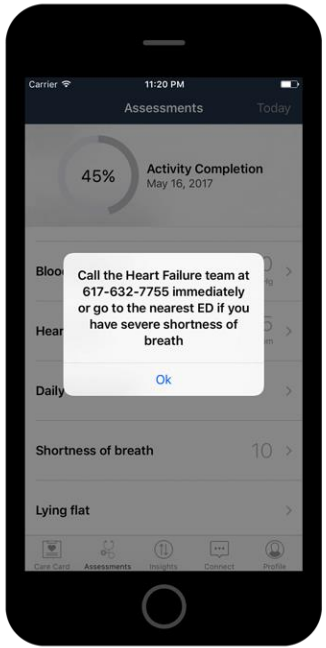




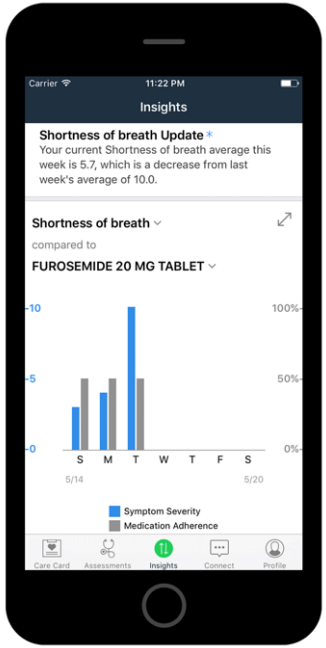
Monitoring to Management

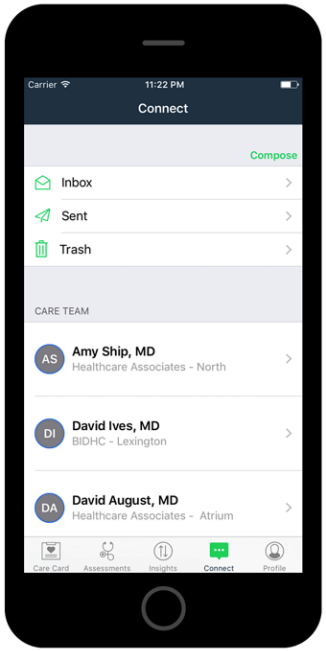






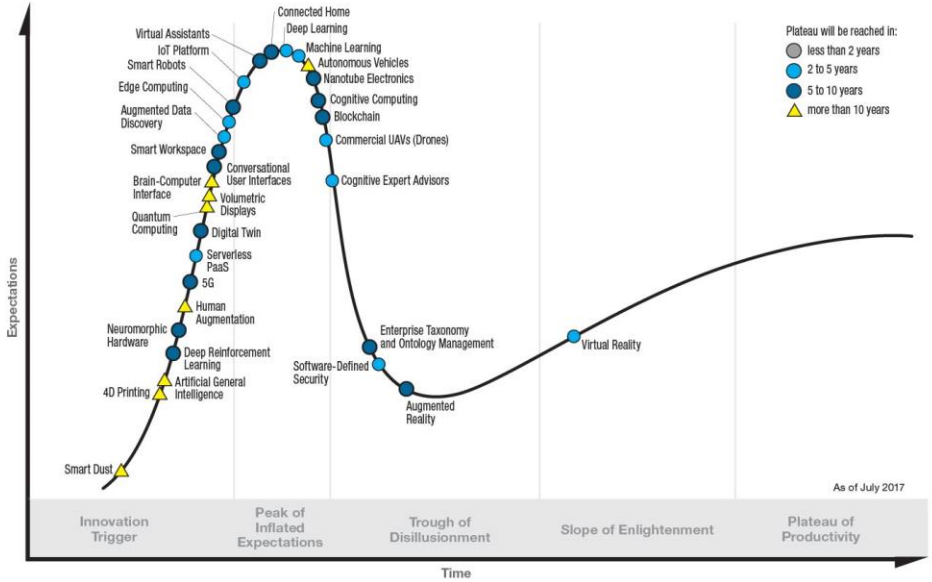
Insights and Messaging





Hub for Wearables and Internet of Things

Gartner Hype Cycle for Emerging Technologies, 2017

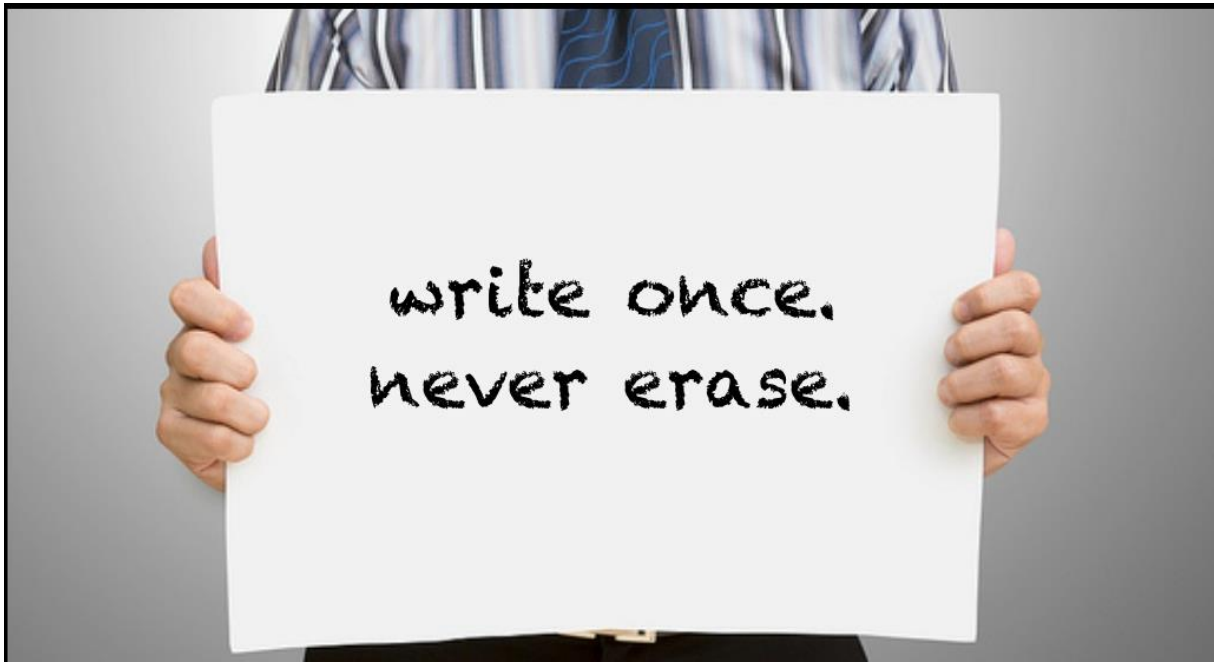


gartner.com/SmarterWithGartner

Source: Gartner (July 2017)

Gartner

What is Blockchain?



Hashing


Hormel
Mary Kitchen
Corned Beef
Hash
HOMESTYLE


Hormel
Mary Kitchen
Corned Beef
Hash
HOMESTYLE

Machine Learning Projects

Priority Projects	
1	Predict when a patient in the hospital will be discharged.
2	Predict no shows for ambulatory appointments.
3	Optimize operating rooms (OR) block allocation
Future Projects	
4	Predict at the time of discharge the probability that the patient will be re-admitted within 30 days and make prescriptive decisions in order to minimize the number
5	Minimize the overall length of stay at the hospital by studying the interaction between the Emergency Department (ED) and the main hospital at Beth Israel Deaconess Medical Center (BIDMC). Reduce number of patients that are re-admitted within 30 days.
6	Predict at the time of admission of a patient to the ED the probability that the patient will need an ICU bed and for how long
7	Apply methods developed by the PI in the area of personalized medicine for particular diseases; examples include but are not limited to diabetes, coronary heart disease, and breast cancer

Questions?

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