How Harnessing the Power of Technology and Innovation can Improve Health Outcomes, Global Health and Health Systems

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Public Health Leadership Forum
Massachusetts Medical Society
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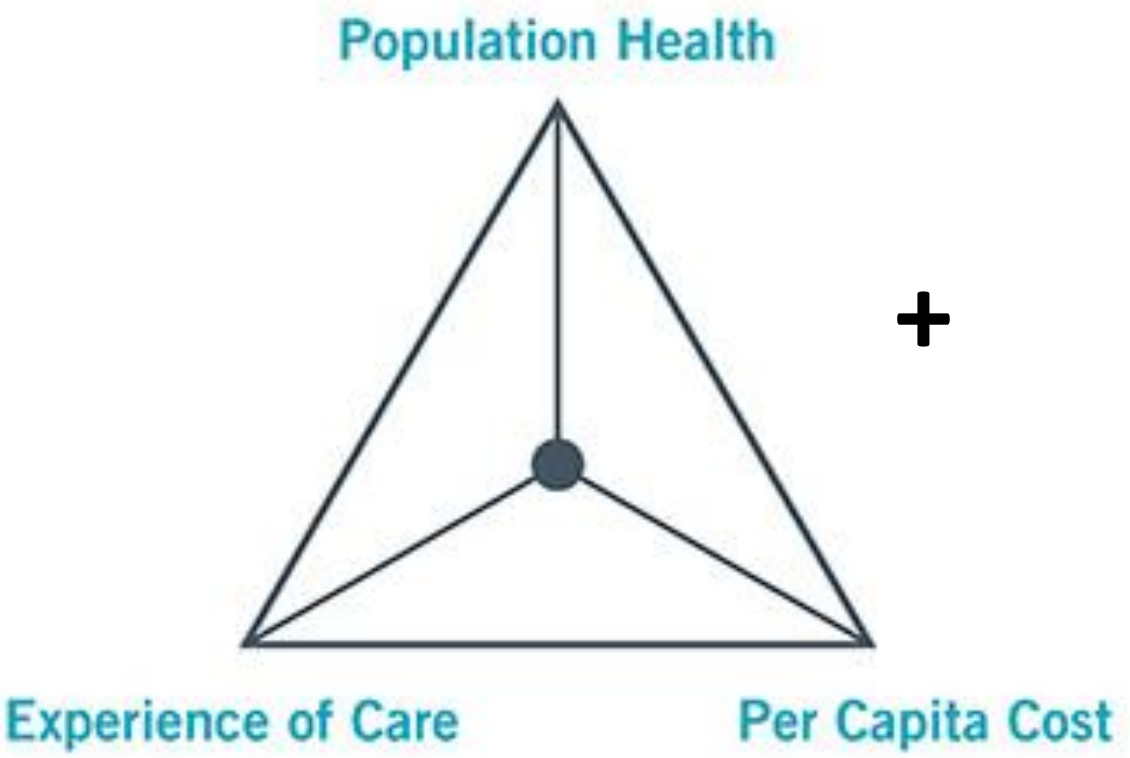
innovation hub
BWH BRIGHAM AND WOMEN'S HOSPITAL

Outline

- The Opportunity to Improve Health Care with Technology and Innovation
- Adoption of Electronic Health Records
- Digital Transformation of Healthcare

The Health Opportunity



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Improving Clinician Experience

Health Affairs 27, no.3 (2008):759-769
http://www.ihi.org/Engage/Initiatives/TripleAim/pages/default.aspx
Ann Fam Med. 2014 Nov; 12(6): 573–576.

Better health, better care, and lower cost

Culture	Participatory, team-based, transparent, improving
Design and Processes	Patient-anchored and tested
Patients and the Public	Fully and actively engaged
Decisions	Informed, facilitated, shared, and coordinated
Care	Starting with best practice, every time
Outcomes and Cost	Transparent and constantly maintained
Knowledge	Ongoing, seamless product of services and research
Health Information	Reliable, secure and reusable resource
Data Utility	Data stewarded and used for the common good
Digital Technology	Engine for continuous improvement
Trust fabric	Strong, protected, and actively nurtured
Leadership	Multi-focal, networked, and dynamic

Institute of Medicine. The Learning Health System and its Innovation Collaboratives: Update Report. http://www.iom.edu/Activities/Quality/~/media/Files/Activity%20Files/Quality/VSRT/Core%20Documents/ForEDistrib.pdf

How do you incentive adoption and use of HIT?

US Adoption of HIT was Low *in 2008*

Hospital	
Comprehensive EHR	1.5%
Basic EHR	7.6%
Ambulatory	
Fully-functional EHR	4%
Basic EHR	13%

Jha AK, DesRoches CM, Campbell EG, Donelan K, Rao SR, Ferris TG, Shields A, Rosenbaum S, Blumenthal D. Use of electronic health records in U.S. hospitals. N Engl J Med. 2009 Apr 16;360(16):1628-38.
DesRoches CM, Campbell EG, Rao SR, Donelan K, Ferris TG, Jha A, Kaushal R, Levy DE, Rosenbaum S, Shields AE, Blumenthal D. Electronic health records in ambulatory care--a national survey of physicians. N Engl J Med. 2008 Jul 3;359(1):50-60.

United States Support for Health IT

Office of the National Coordinator for HIT

American Recovery & Reinvestment Act

Meaningful Use

2004 2009 2010

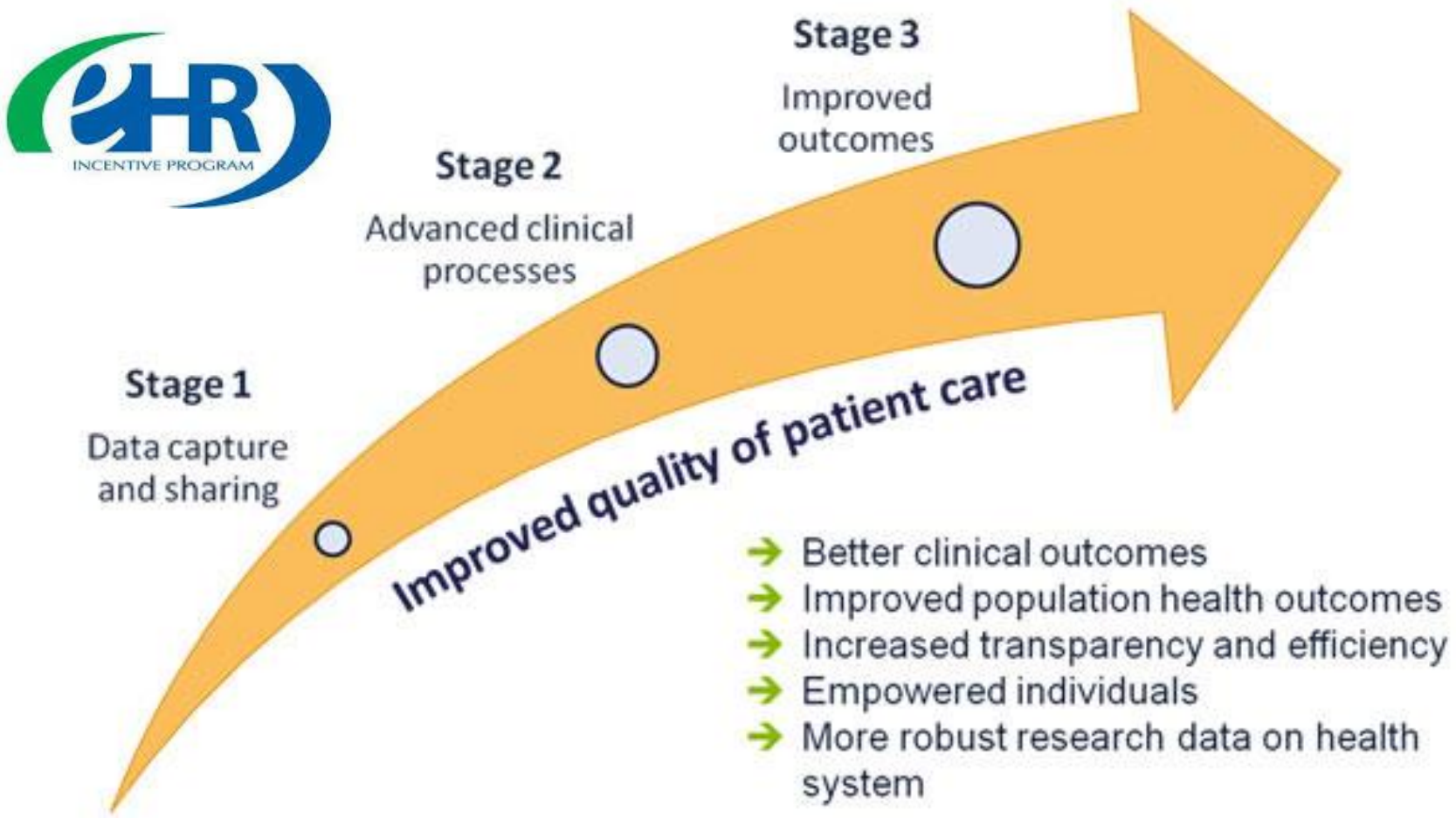
Meaningful Use

- 5 Goals for Healthcare System
  - Improve quality, safety and efficiency
  - Engage patients
  - Increase coordination of care
  - Improve health of population
  - Ensure security and privacy
- Three Requirements
  1. Use certified EHR technology
  2. Use in “meaningful way”
  3. Submit Clinical Quality Measure

Stage 1 Meaningful Use

Eligible Hospital and CAH Core Objectives (use the links below to view/download individual Measures)	Status
(1) Use CPOE for medication orders directly entered by any licensed healthcare professional who can enter orders into the medical record per State, local, and professional guidelines.	AVAILABLE
(2) Implement drug-drug and drug-allergy interaction checks.	AVAILABLE
(3) Maintain an up-to-date problem list of current and active diagnoses.	AVAILABLE
(4) Maintain active medication list.	AVAILABLE
(5) Maintain active medication allergy list.	AVAILABLE
(6) Record all of the following demographics: (A) Preferred language. (B) Gender. (C) Race. (D) Ethnicity. (E) Date of birth. (F) Date and preliminary cause of death in the event of mortality in the eligible hospital or CAH.	AVAILABLE
(7) Record and chart changes in the following vital signs: (A) Height. (B) Weight. (C) Blood pressure. (D) Calculate and display body mass index (BMI). (E) Plot and display growth charts for children 2–20 years, including BMI.	AVAILABLE
(8) Record smoking for patients 13 years old or older.	AVAILABLE

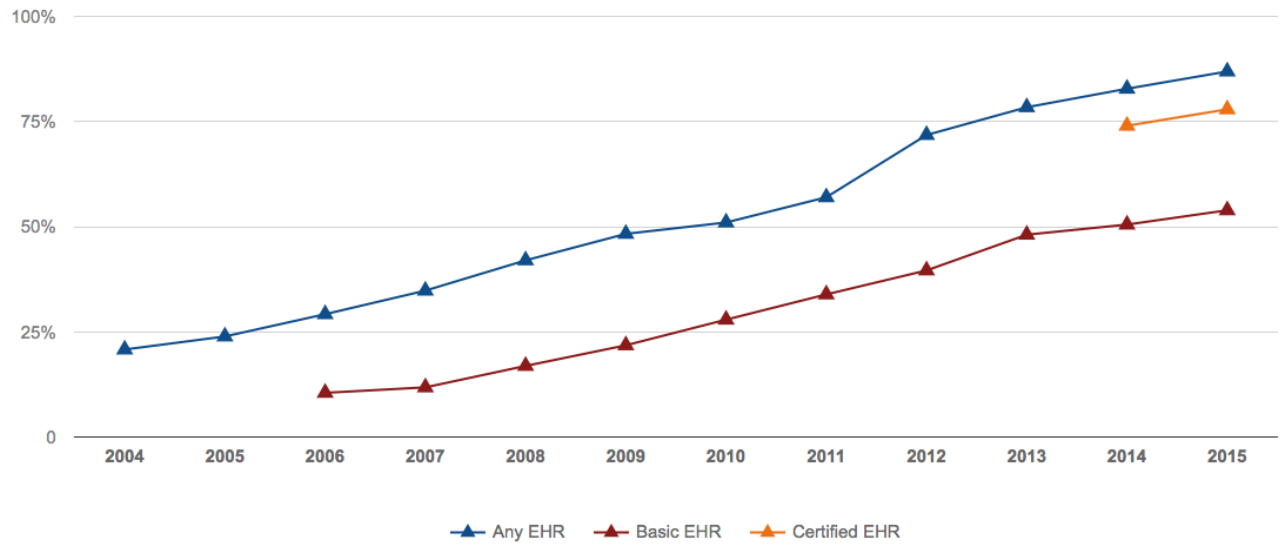
Meaningful Use Program



http://www.ehealthdc.org/meaningful-use/

MU Policy is Improving EHR Adoption (Ambulatory Practices)

Percentage of Office-based Physicians with EHR System (2004-2015)

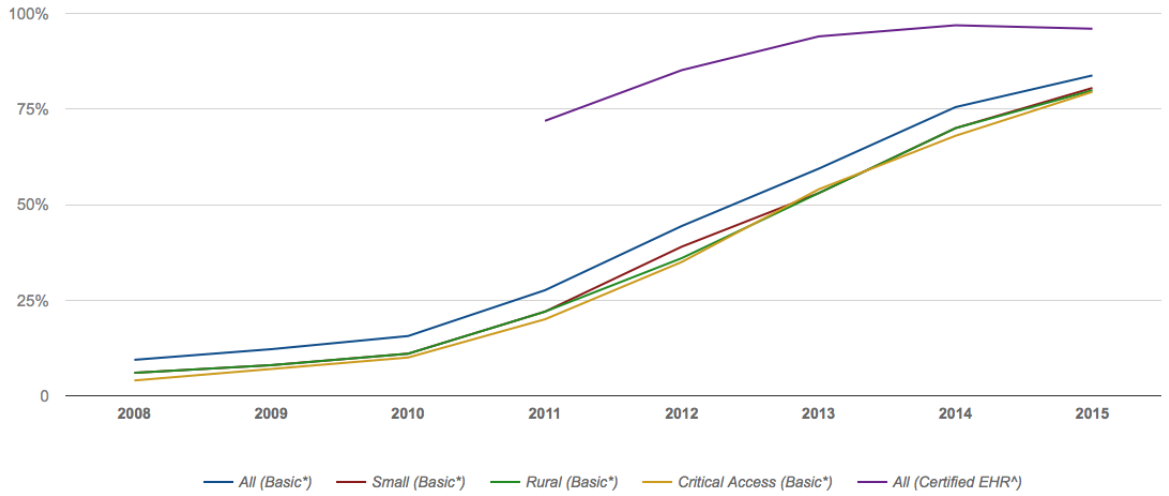


	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Any EHR	20.8%	23.9%	29.2%	34.8%	42%	48.3%	51%	57%	71.8%	78.4%	82.8%	86.9%
Basic EHR	--	--	10.5%	11.8%	16.9%	21.8%	27.9%	33.9%	39.6%	48.1%	50.5%	53.9%
Certified EHR	--	--	--	--	--	--	--	--	--	--	74%	77.9%

Office of the National Coordinator for Health Information Technology. 'Office-based Physician Electronic Health Record Adoption,' Health IT Quick-Stat #50. dashboard.healthit.gov/quickstats/pages/physician-ehr-adoption-trends.php. December 2016.

MU Policy is Improving EHR Adoption (Hospitals)

Percentage of Non-federal Acute Care Hospitals with EHR System (2004-2015)



Hospital EHR Adoption	Percent of Hospitals with EHR							
	2008	2009	2010	2011	2012	2013	2014	2015
All Hospitals with a Basic EHR*	9%	12%	16%	28%	44%	59%	76%	84%
All Small Hospitals with a Basic EHR*	6%	8%	11%	22%	39%	53%	70%	81%
All Rural Hospitals with a Basic EHR*	6%	8%	11%	22%	36%	53%	70%	80%
All Critical Access Hospitals with a Basic EHR*	4%	7%	10%	20%	35%	54%	68%	80%
All Hospitals with a Certified EHR^	--	--	--	72%	85%	94%	97%	96%

*Basic EHR with Clinician Notes

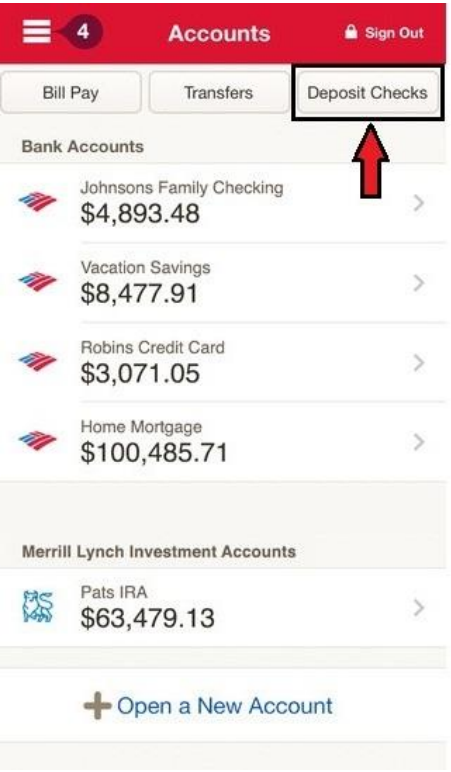
^2014 estimate was 96.9 and 2015 estimate was 96.0; the difference is not statistically significant

Office of the National Coordinator for Health Information Technology. 'Non-federal Acute Care Hospital Electronic Health Record Adoption,' Health IT Quick-Stat #47. dashboard.healthit.gov/quickstats/pages/FIG-Hospital-EHR-Adoption.php. May 2016.

What’s Next

Digitizing the Healthcare Experience

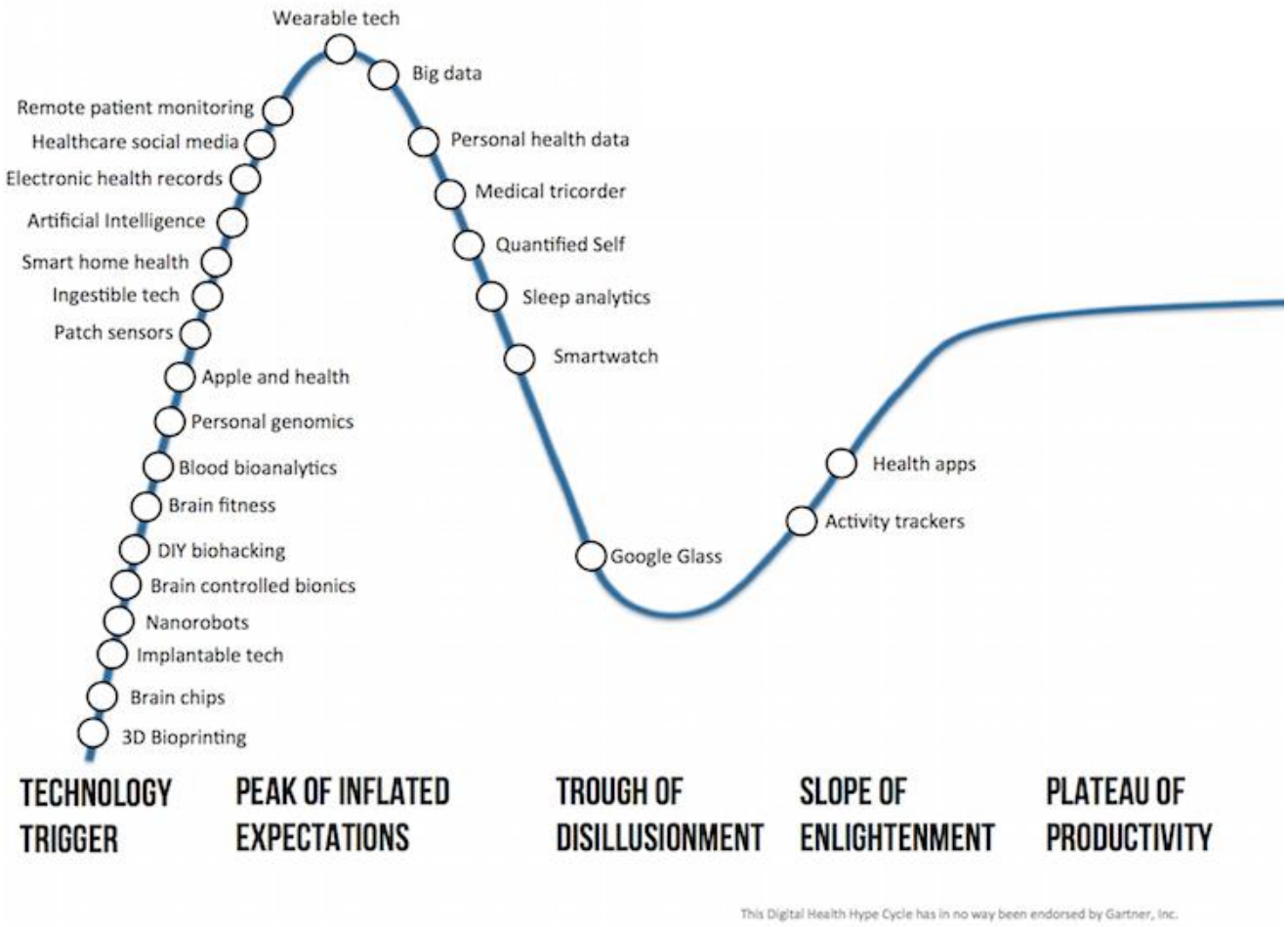
Banking 2017 vs. Outpatient Clinics



The Digital Health Opportunity

- The digital health market is projected to be $233 billion in 2020
  - Digital medical devices
  - Analytics & Big Data
  - Patient engagement
  - Population health management
  - Personalized medicine
  - Payer administration

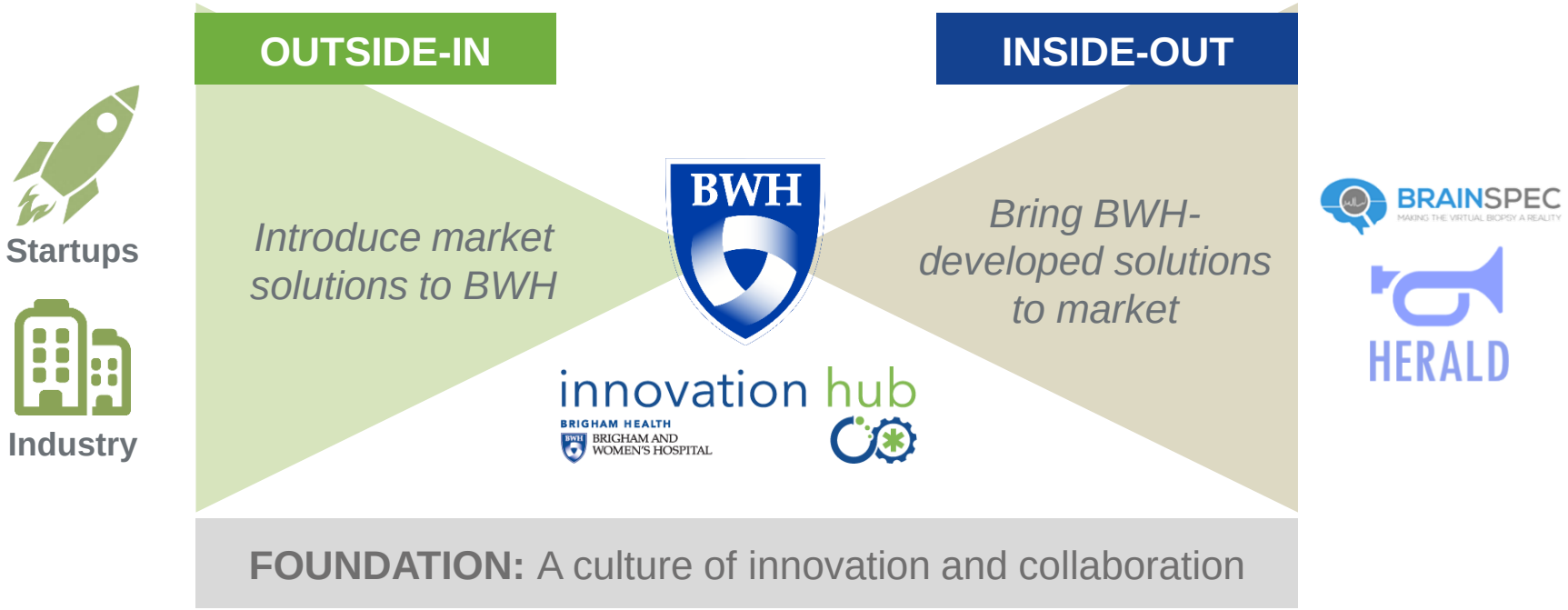
Digital Health Hype Cycle



Davies S. The Digital Health Hype Cycle. BIONIC.LY, http://bionic.ly/digital-health-hype-cycle/

BWH Digital Innovation Hub (iHub)

MISSION: Drive more patient-centered, efficient and safe care through use, development, evaluation and commercialization of digital health



Hospital Needs-Driven Innovation

Map Digital Efforts to Institutional Priorities

Hospital challenges and pain points

Bring challenges closer to the solution ecosystem.

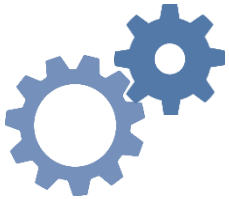
Clear the path to an implementation decision.

Digital solutions

Solution Approaches

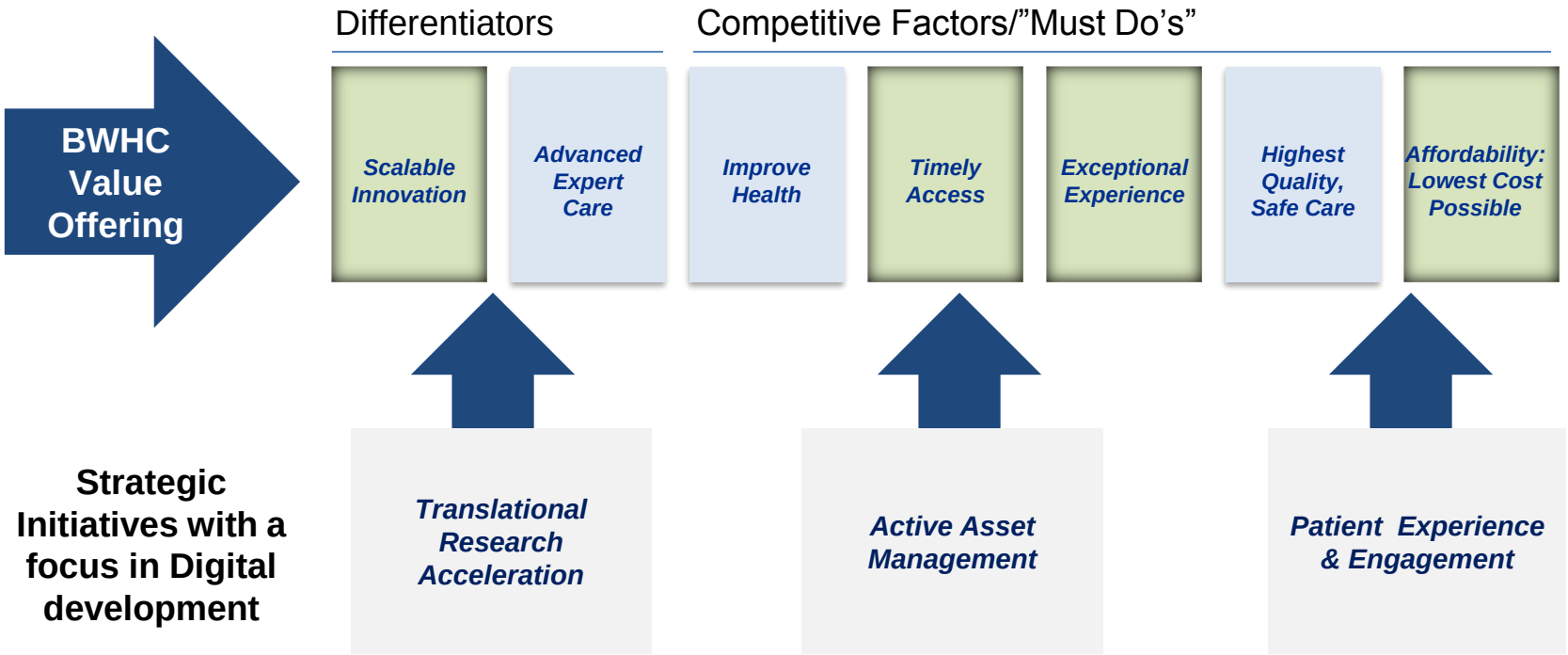
Build

Buy



Co-Develop

Prioritize based on Institutional Strategic Initiatives



Fertilex: Home Male Infertility Screening Device

Hadi Shafiee Ph.D.
Translational Research

Problem: Testing & Screening

1 in 7 - US couples are Infertile

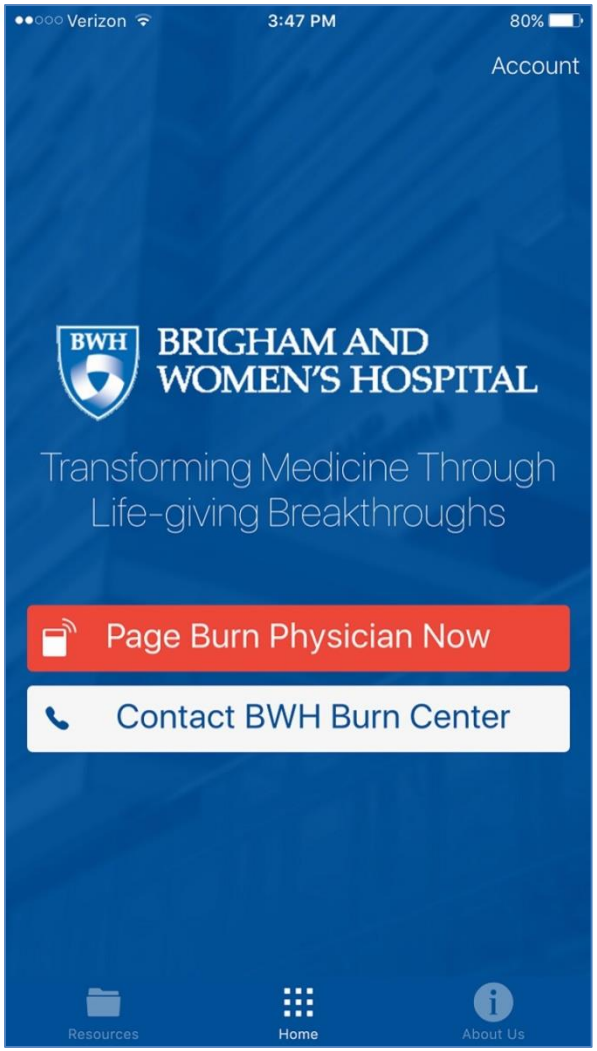
50% - Male contributes to couple's infertility

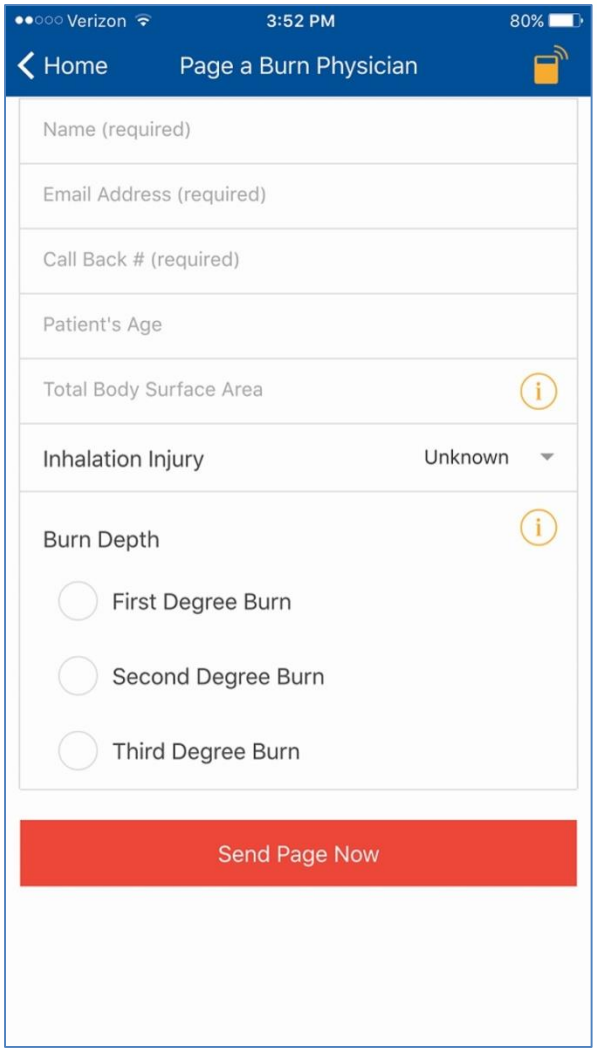
Solution: Home-based Rapid Sperm Analyzer

Measures more features of sperm than just sperm count

BWH Burn Transfer Application

Active Asset Management





IoT Button

Patient Experience

Creating Infrastructure to Accelerate Digital Innovation

ONBOARDING DIGITAL

Help onboard new technologies to test and accelerate pilots.

DIGITAL HEALTH INNOVATION GUIDE

INTEGRATION

BWH is developing a platform to connect outside applications to streamline integration with enterprise IT systems.

REDOX^

ENTERPRISE ACCESS

Developed a Research & Innovation Portal to simplify adding applications into Epic and clinical workstations.

CARE SETTING DELIVERY

BWH provides a broad digital testing arena for inpatient, ambulatory, post-acute/home and more through various technology end points (Computer, tablets, mobile, etc…)

Digital Health Innovation Guide (DHIG)

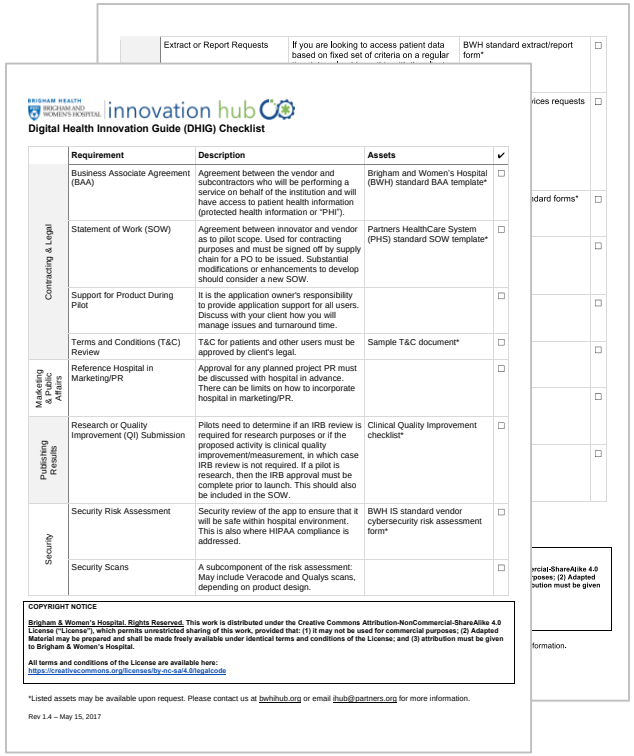
The DHIG governance committee and process **reduces risk for both individual projects and for the broader organization,** improving the likelihood success by ensuring proper approvals and best practices are followed.

CROSS-FUNCTIONAL GUIDANCE

Information Security, Partners eCare, Compliance, IRB, Partners Innovation and other teams

CHECKLIST-DRIVEN PROCESS

Pre-approved/customizable guardrails and regular check-ins keep projects on track



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Digital Health Innovation Guide (DHIG) Checklist

	Requirement	Description	Assets	✔
Contracting & Legal	Business Associate Agreement (BAA)	Agreement between the vendor and subcontractors who will be performing a service on behalf of the institution and will have access to patient health information (protected health information or "PHI").	Brigham and Women's Hospital (BWH) standard BAA template*	☐
	Statement of Work (SOW)	Agreement between innovator and vendor as to pilot scope. Used for contracting purposes and must be signed off by supply chain for a PO to be issued. Substantial modifications or enhancements to develop should consider a new SOW.	Partners HealthCare System (PHS) standard SOW template*	☐
	Support for Product During Pilot	It is the application owner's responsibility to provide application support for all users. Discuss with your client how you will manage issues and turnaround time.		☐
	Terms and Conditions (T&C) Review	T&C for patients and other users must be approved by client's legal.	Sample T&C document*	☐
Marketing & Public Affairs	Reference Hospital in Marketing/PR	Approval for any planned project PR must be discussed with hospital in advance. There can be limits on how to incorporate hospital in marketing/PR.		☐
Publishing Results	Research or Quality Improvement (QI) Submission	Pilots need to determine if an IRB review is required for research purposes or if the proposed activity is clinical quality improvement/measurement, in which case IRB review is not required. If a pilot is research, then the IRB approval must be complete prior to launch. This should also be included in the SOW.	Clinical Quality Improvement checklist*	☐
Security	Security Risk Assessment	Security review of the app to ensure that it will be safe within hospital environment. This is also where HIPAA compliance is addressed.	BWH IS standard vendor cybersecurity risk assessment form*	☐
	Security Scans	A subcomponent of the risk assessment: May include Veracode and Qualys scans, depending on product design.		☐

*Listed assets may be available upon request. Please contact us at twhihub.org or email ihub@partners.org for more information.

Rev 1.4 – May 15, 2017

IMPACT TO DATE

70+ PROJECTS REVIEWED

9 MONTHS AVERAGE TIME FROM INTAKE TO PILOT FOR PROJECTS WHICH ULTIMATELY EXECUTED A PILOT

Digital Health: Massachusetts

- **Massachusetts is the premier destination for healthcare innovation**
  - Home to top provider systems, academic medical centers, medical schools and technology powerhouses
- The **Mass Digital Health Council** connects public, private, academic and healthcare leaders to **build a stronger and more connected statewide digital health ecosystem**
- Three **key recommendations**:
  1. Create a MA Distributed Healthcare Data Network
  2. Create 2 Sandbox Environments (Home, Hospital)
  3. Double down on PULSE@MassChallenge

MASSDIGITALHEALTH

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WHAT ARE YOU INNOVATING TODAY?

Questions

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