



Health Care IT Suite

Mobility for Health Care

How to Gird Your Gadgets

Road Map



1

Mobility Business Drivers and Choices

2

Technologies, Standards, and Management

3

Applications, Futures, and Advice

Mobile Health—On the Rise



“Consumer Electronics Association”

- 36% of consumers are interested in using mobile health IT applications to communicate with health care providers.
- 40% of consumers said they have used a technology device in the past year to monitor their health or wellness
- 40% are interested in vital sign monitors
- 37% are interested in mobile fitness devices



“Quantia Communications”

- More than 80% of physicians surveyed own a mobile device capable of downloading applications



“Manhattan Research”

- 26% of adults use mobile phones to access health information
- 75% of U.S. physicians own some form of Apple device, such as an iPhone, iPad or iPod

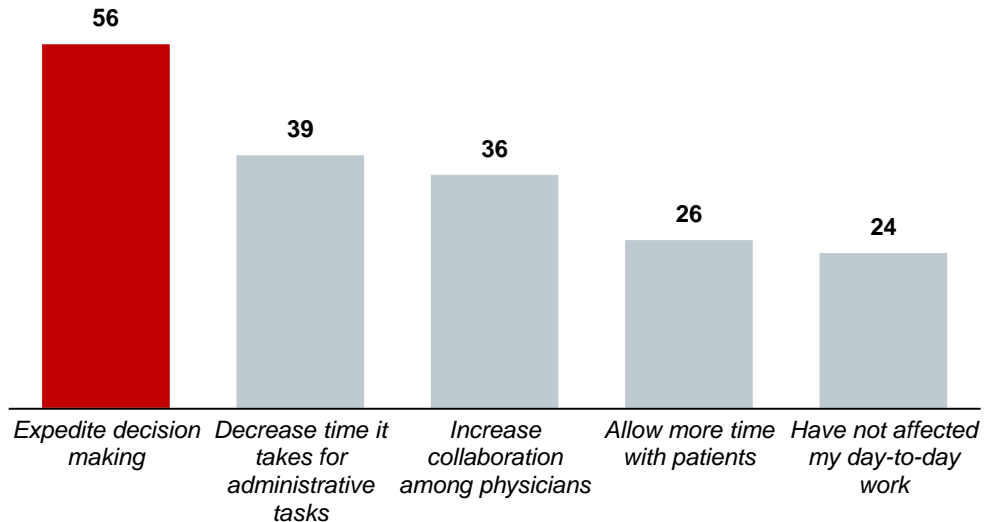


“Veterans Administration”

- Plans to acquire up to 100,000 tablet computers running Apple iOS, Android, and Windows OSs for physicians, nurses and technicians at VA medical centers
- One of the largest transitions to mobile devices by a civilian agency

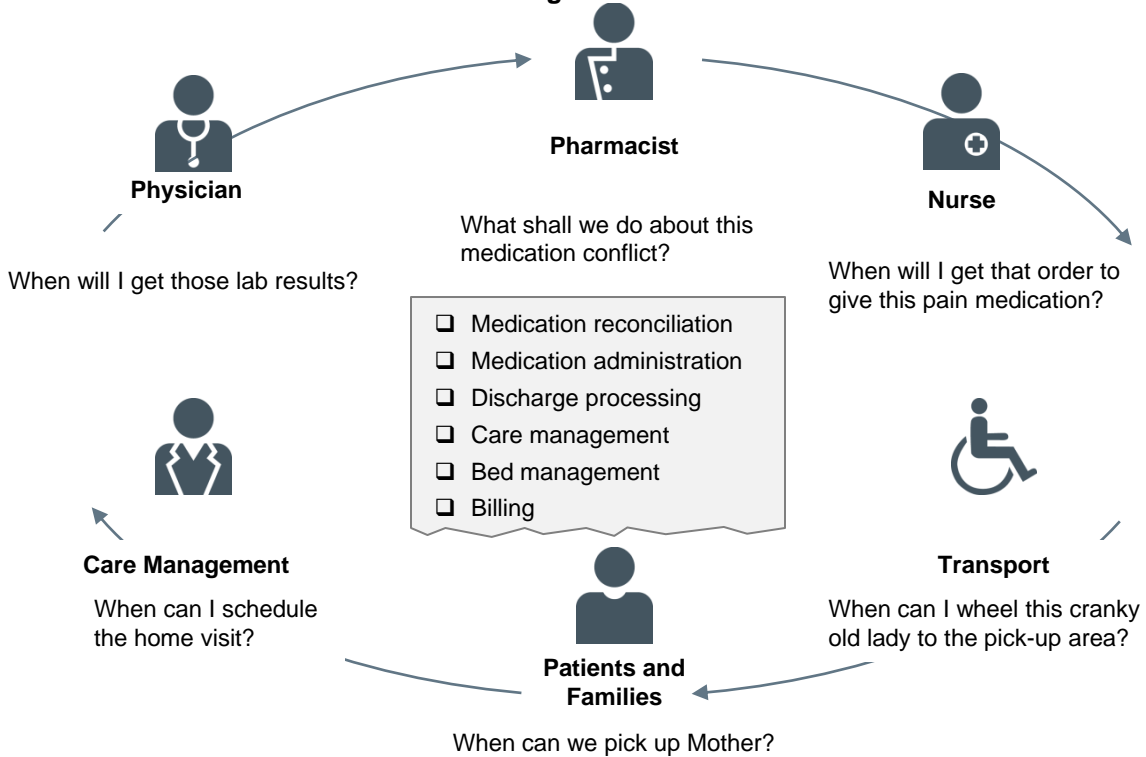
Are We Underestimating the Impact of Mobile Health?

Percent of Physicians Surveyed Who Said Mobile Health Would Have These Impacts (PWC Survey)



Mobility-Enabled Business Process Management

Who is Waiting on What from Whom?



Lots of Mobile Choices and Challenges

How Many Combinations Can Be Supported by Providers and Vendors?

	Devices	Operating Systems	Wireless	Middleware	Applications
Choices	Smart phones Tablets Medical devices Laptops WOWs	Google Apple Microsoft RIM/QNX Symbian	Verizon AT&T Sprint T-Mobile Cisco NetGear Aruba	Citrix Microsoft Wavelink Airwatch MobileIron Good Technology Tangoe Zenprise SAP/Sybase Symantec Many others	EMR, CPOE Voice E-mail Alerts Locationing Patient engagement Social networking Remote monitoring Telemedicine Video conferencing Almost anything!
Issues	Size Weight Durability Disinfecting Cost Features Ownership Battery life	Openness Standards Security Stability Corporate fit Marketshare	Coverage Cost Contracts Bandwidth Interference	Manageability Cost Integration App stores Platform support Virtualization SaaS/Cloud	Appropriateness Workflow/BPM Vendor readiness Mission critical FDA regulation Security Performance Cloud-based

Mobile Health – Opportunities and Challenges

“

Commingling Business and Personal Use

“I’m a great champion of mobile devices and I truly believe the future of all clinician workflow is mobile, but that enthusiasm has to be tempered by the risks of commingling “Angry Birds” with clinical lookup on the same device.”

Dr. John Halamka

“

Valuable Enabler or Dangerous Distraction?

“A peer-reviewed survey of 439 medical technicians published this year in *Perfusion*, a journal about cardio-pulmonary bypass surgery, found that 55 percent of technicians who monitor bypass machines acknowledged to researchers that they had talked on cell phones during heart surgery. Half said they had texted while in surgery.”

New York Times

Road Map

1

Mobility Business Drivers and Choices

2

Technology, Standards, and Management

3

Applications, Futures, and Advice

Welcome to Gadgetopia (Representative)!

Hot Stuff



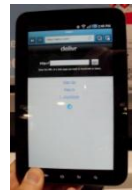
**iPhone
Smartphone**



**iPad
Tablet**



**Vocera
Voice Badge**



**Samsung
Galaxy Tablet**



**Motion Computing
C5 Mobile Clinical
Assistant**



**Motorola Xoom
Tablet**

Size, cost, battery life and charge time, performance, instant on, wireless capability, weight, durability, features, screen resolution, connectivity, OS, memory, microphone, keyboard, touchscreen, camera, chargers, GPS, color!



**Panasonic
Toughbook H2**



**Philips IntelliVue
MX40 Patient Monitor**



**RIM Playbook
Tablet**



**Samsung
Epic 4G
Smartphone**



**Motorola
Atrix
Smartphone**



**Motorola
MC55 PDA/Scanner**

Source: Apple, Vocera, Samsung, Motion Computing, Panasonic, Philips, RIM, Motorola; Health Care Advisory Board interviews and analysis.

Whose Device and Whose Data?

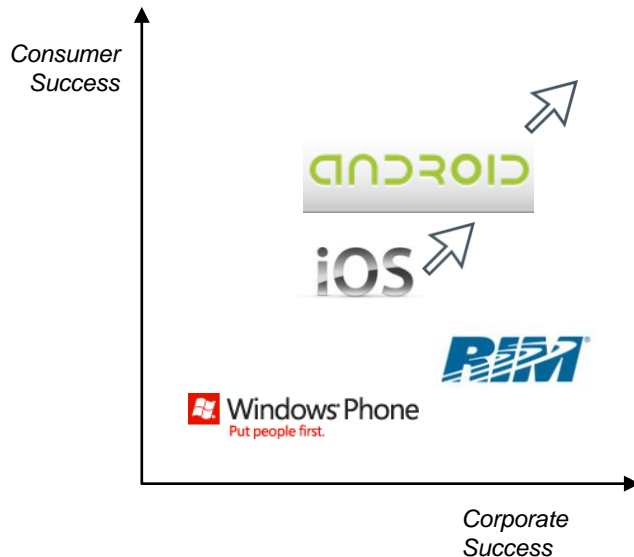
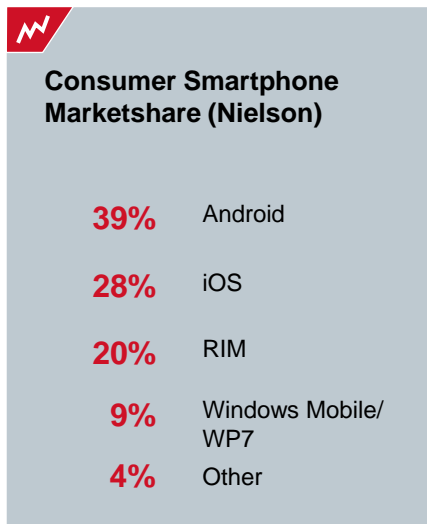
Different Degrees of Freedom Depending on the Circumstances

	User Applications and Data	Corporate Applications and Data
User Device	<ul style="list-style-type: none"> Users should not have to worry about the corporation wiping their personal data Any personal applications allowed, but could limit what corporate applications are allowed 	<ul style="list-style-type: none"> Certain corporate applications only possible if they can be isolated from user data and applications—generally using MDM/VPN Browser-based corporate applications only? Generally no direct corporate attachment Corporate applications only allowed on some devices, OSs, and release levels Corporate data can be wiped clean remotely Corporate discount/bulk purchase possible? Tax issues?
Corporate Device	<ul style="list-style-type: none"> Users risk the chance of losing personal data should the corporation decide to wipe the device Only certain personal applications allowed Device may need to be surrendered at any time Users may be responsible for the cost of the device if it is lost, stolen, or damaged 	<ul style="list-style-type: none"> Corporate applications running in full fidelity and fully protected from any user data and applications using MDM/VPN Users limited to supported devices, OSs, and release levels Devices can be directly attached to the corporate network

Operating System Wars

Control for the Mobile Device

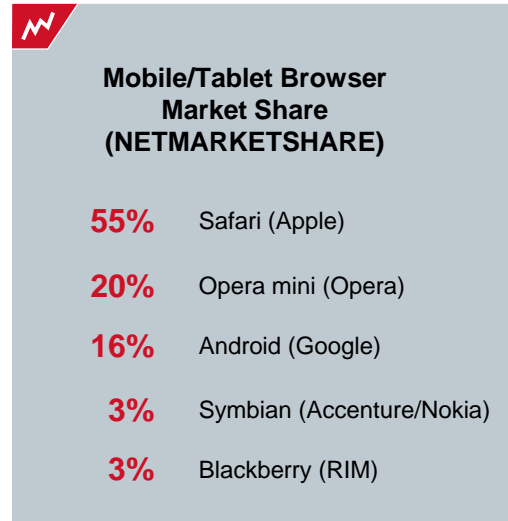
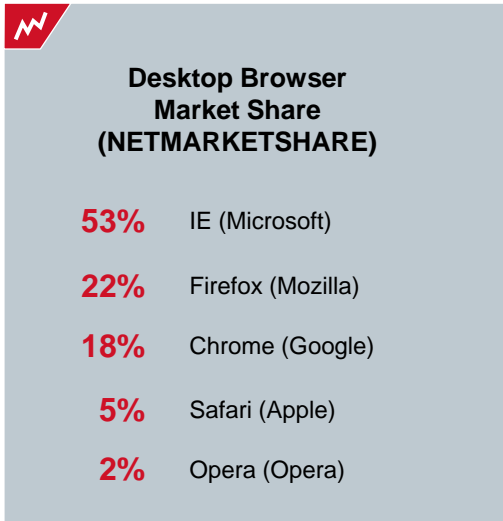
Consider Openness, Features, Security, Carrier and Vendor Support



Browser Wars

Control for the Mobile Application Environment

Consider Openness, Features, Security, Device and Vendor Support



Carriers – Your Experience Will Vary

Providers Must Take into Consideration Carrier Differentiators

Consider Coverage, Speed, Costs, Device Support, Contracts, Quality, Customer Service, Etc.

Telecom	Notable Differentiators
Verizon	<ul style="list-style-type: none"> • Best overall customer service in the industry (J.D. Powers) • Largest customer base (by tens of millions) • Rolling out an extensive, high-speed 4G LTE network (mostly in large cities) • Extensive media offerings
AT&T	<ul style="list-style-type: none"> • Last overall in customer service ratings (J.D. Powers) • Early provider of talk and surf at the same time • HSPA+ network the fastest depending on chipset in device • AT&T download rates 62 percent faster and upload rates 38 percent faster than Verizon as tested in the San Francisco region (JD Powers)
Sprint/Nextel	<ul style="list-style-type: none"> • Unlimited data plans with iPhone • Committing to going to LTE in 2012 • Claimed first 4G National service in the US • Pioneer in push-to-talk capabilities
T-Mobile	<ul style="list-style-type: none"> • 2nd overall best customer service in the industry (J.D. Powers) • Claims largest 4G network in the country • Pending (troubled) merger with AT&T which wants its LTE clients

Mobile Standards and Organizations

Lots of Opportunities to Learn and Collaborate Emerging

Continua Health Alliance

- Non-profit, open industry organization of 240 health care and technology companies collaborating to improve the quality of personal health care
- Member companies select connectivity standards and publish guidelines for strict interoperability
- Establishing a test and certification program with a logo signifying interoperability with other certified products

Open Mobile Alliance

- Formed by 200+ companies including mobile operators, device and network suppliers, IT companies and content and service providers
- Development of mobile service enabler specifications

mHIMSS

- New mobility-focused initiative from HIMSS with its own web destination and community
- Hospital Mobile Adoption Workgroup under the Enterprise Information Systems Committee

IHE Patient Care Device Domain

- Alarm communication management
- Device enterprise communication
- Patient identity binding
- Subscribe to patient data
- Point of care infusion verification
- Rosetta terminology mapping

Open Handset Alliance

- Google Android development group
- 84 technology, mobile companies

mHealth Alliance

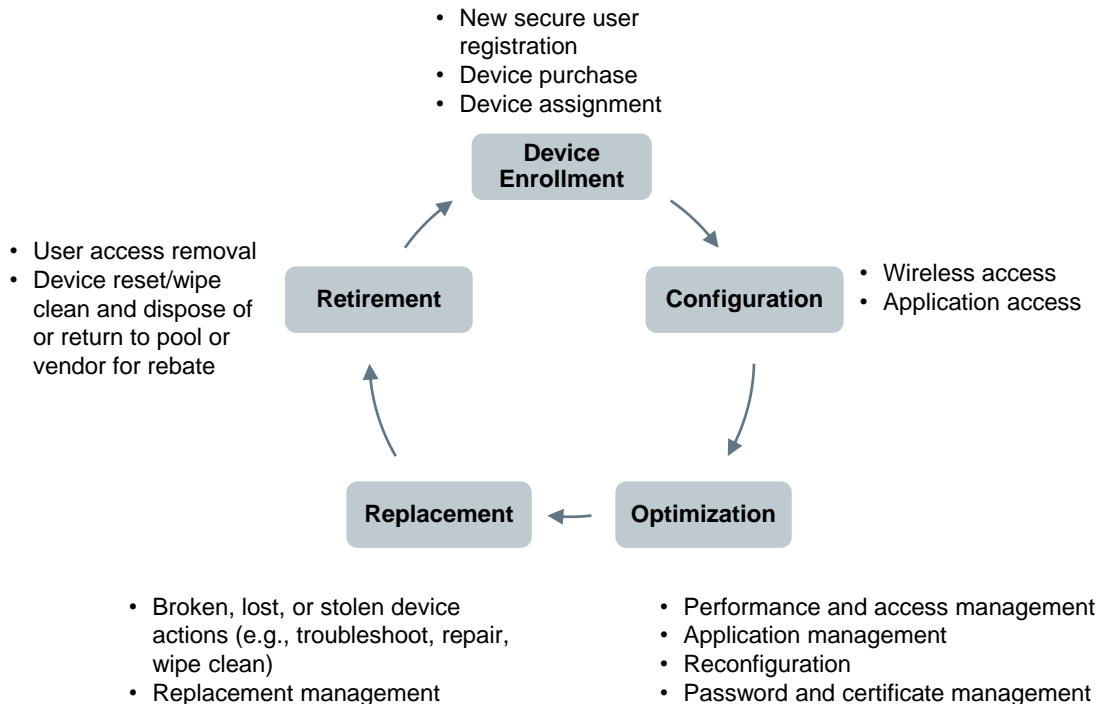
- Advances mHealth through research, advocacy, and support for the development of interoperable solutions and sustainable deployment models
- Founded by the UN, Rockefeller, and Vodafone Foundations

Center for Connected Health (Partners HealthCare)

- Founded in 1995 by Harvard Medical School teaching hospitals
- Evaluates new technologies/programs
- Develops/executes feasibility studies and clinical trials

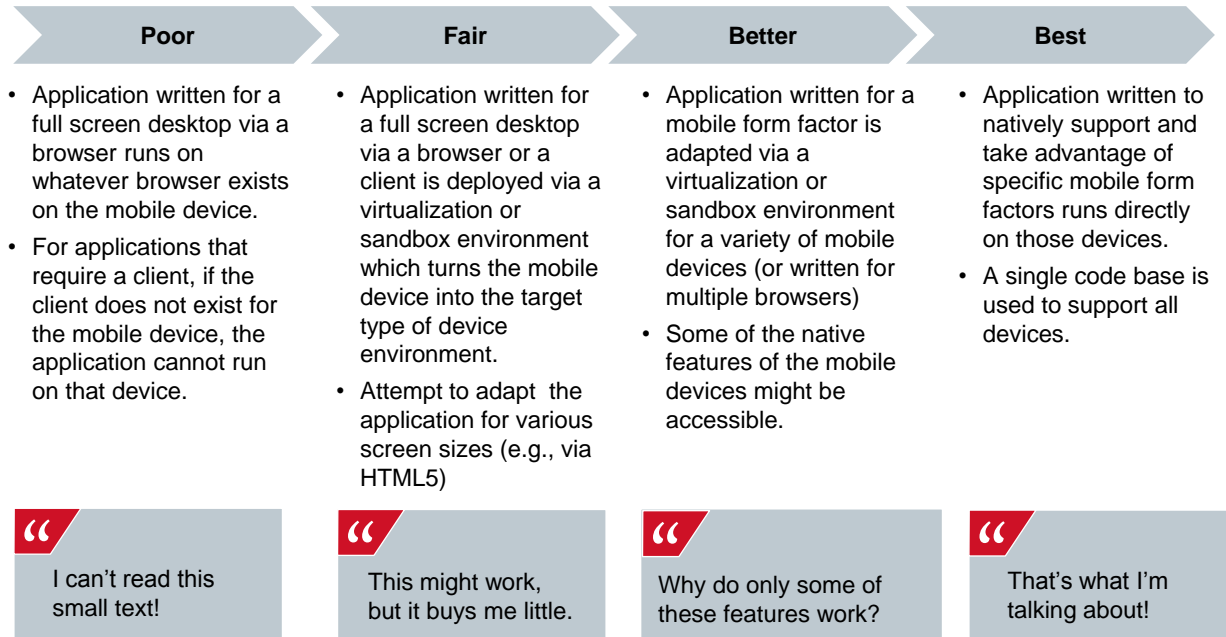
Mobile Device Management LifeCycle

Can be Expensive and a Security Risk if Not Done Well



From Nada to Force-Fit to Native Device Support

Increasingly Valuable Approaches to Mobile Application Deployment



Layers of Mobile Security

We Can Do This!

Defending the Castle...

Layer	Protection	Issues
Application	<ul style="list-style-type: none"> • Password/pattern/challenge • Token • Encryption 	<ul style="list-style-type: none"> • Certain applications require multi-factor? • Browser or client security approach? • Role-based?
Mobile Device Management	<ul style="list-style-type: none"> • Sandbox/virtualization • Remote device wipe • Jailbreak/rooting detection • Certificates 	<ul style="list-style-type: none"> • Device agent required? • Multi-platform support? • Monitor functions? • Remote control of device?
Wireless/ Transport/ Servers	<ul style="list-style-type: none"> • Proprietary network/VPN/Tunnel • Channel switching • Rogue app protection • Firewalls 	<ul style="list-style-type: none"> • Properly configured and monitored? • Location restricted? • Wireless security protections?
Operating System	<ul style="list-style-type: none"> • Strong passwords • Storage level encryption • Time-outs 	<ul style="list-style-type: none"> • Available security features properly configured and in use? • Minimum release level required?
Device	<ul style="list-style-type: none"> • Biometric reader • Storage card • USB and other connectors • GPS 	<ul style="list-style-type: none"> • Device owned/paid for by user or corporation? • Shared device? • Data can be copied from the device?

Taking Mobility to the Users

From Reactive to Proactive



Case in Brief: Beaumont Health System

- \$2.5 Billion Multi-Hospital Health System in Michigan
- Over 3000 physicians in private practice in a competitive marketplace
- Many legacy systems had been in use by the health system
- Decided to make major changes that would show clinical and financial value, improve the patient experience, and provide differentiation—with IT as a key enabler
- Moved to Epic and big-bang CPOE
- Moved from conservative to aggressive with a mobility strategy
- Deployed iPads to senior management for business intelligence applications to show value of mobility and ready access to information
- Initially supported clinical applications on mobile tablets using Citrix
- Set up tables in physician lounges, the cafeteria, etc., and visited practice offices to encourage providers to use their own devices (BYOD)
- Encrypted all devices across the system to ensure security
- Deployed network-based mobile device management including GPS locationing
- Now looking at even more powerful mobile device middleware
- 1000 tablets and mobile devices already being managed

Road Map

1

Mobility Business Drivers and Choices

2

Technologies, Standards, and Management

3

Applications, Futures, and Advice

Really, Who Would Have Believed This?

Downloading Epic's Haiku EMR for iPhone from the iTunes Store

The screenshot shows the iTunes Store interface for the Epic Haiku app. The app is listed as a free medical application. The description states that Haiku provides authorized clinical users with secure access to clinic schedules, hospital patient lists, health summaries, test results, and notes. The app is available for iPhone, iPod touch, and iPad. The version is 1.1.3, updated on October 11, 2011. The app is categorized as Medical and is compatible with iOS 4.0 or later. The screenshots show the app's login screen with fields for User ID and Password, and a patient list for Bartine, Lu.

App Store > Medical > Epic

Epic Haiku

Description

Haiku provides authorized clinical users of Epic's Electronic Health Record with secure access to clinic schedules, hospital patient lists, health summaries, test results and notes. Haiku also supports dictation and In Basket access. Haiku works on both the iPhone and iPod touch.

... [More](#)

[Epic Web Site](#) > [Epic Haiku Support](#) > [Application License Agreement](#) >

What's New in Version 1.1.3

Support for iOS 5

iPhone Screenshots

More iPhone Apps by Epic

iPhone Screenshot 1: Login screen with fields for User ID and Password.

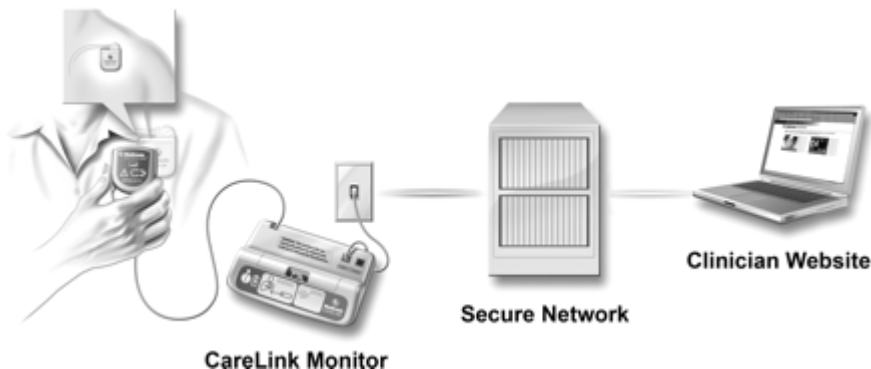
iPhone Screenshot 2: Patient list for Bartine, Lu, showing details like Partial Code, Angina Pectoris, 4399 Audub, 608-555-4567, Problem List, Angina Pectoris, and Hypothyroidism.

Remote Patient Monitoring Will Become Commonplace



Case in Brief: Medtronic CareLink Network

- A clinical trial with 1,997 patients showed that remote monitoring of implantable cardiac device patients reduced the time from a clinically-actionable event to a clinical decision by 79 percent (from 24 days to 3 days) ($p < 0.001$), reduced the average length of hospital stay for cardiovascular reasons by 18 percent (0.7 days), provided an estimated costs savings of \$1,793 per admission, and decreased the number of in-office visits by 38 percent.
- Components include the Medtronic CareLink Network, Home Monitor, Wireless Telemetry, and CareAlert Monitoring for transmitting patient device diagnostic data accessible in the physician's office. Cellular transmission from the patient's home is also possible, and clinicians can access data from iPhones, iPads, etc.



Source: Medtronic 2011 press release describing the CONNECT (Clinical Evaluation of Remote Notification to Reduce Time to Clinical Decision) trial, Journal of the American College of Cardiology, European Society of Cardiology, Health Care Advisory Board interviews and analysis.

Mobile Device Technology Futures

Do You Remember Life Before Cell Phones (Or Even Smart Phones)?

Progress on Multiple Fronts



Virtual Keyboards

- Celluon Magic Cube—projects keys of light on any flat surface



Flexible Displays

- Universal Display Corporation—prototype of a organic light-emitting diode (OLED) flexible screen
- e-Paper approach



Wearable Computers

- Sensory and memory enhancers
- Video and location capture
- Converged devices



Improved Battery Life

- Charging while you move and work



Projection Displays

- Using lasers on surfaces
- i-Glasses—head-mounted displays

Some Questions to Start With

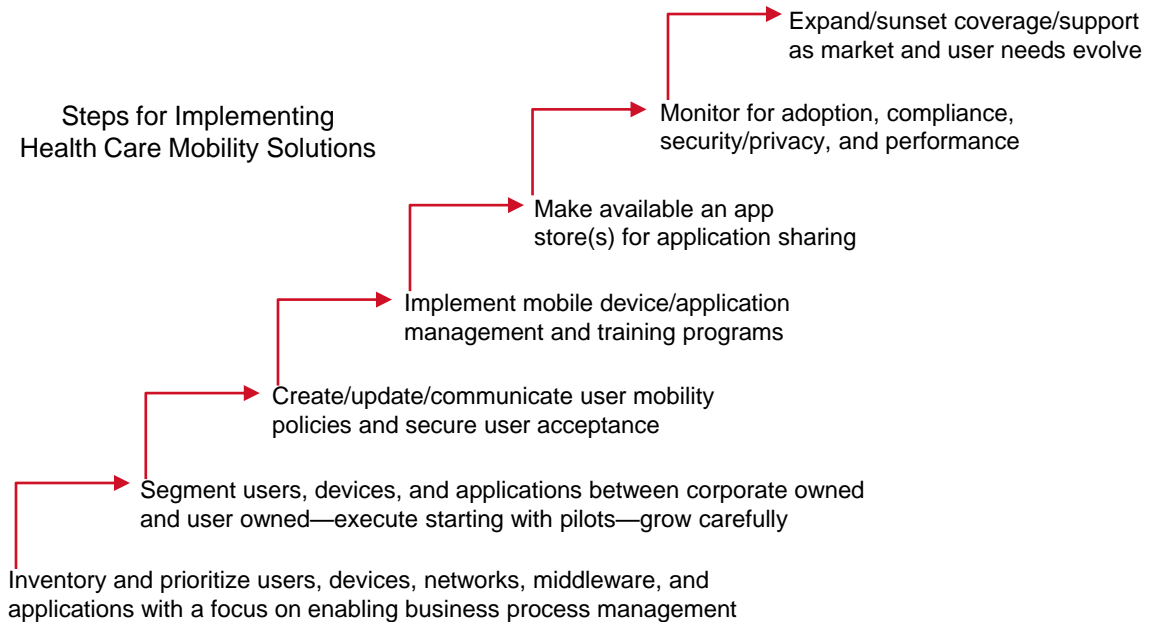
What is Possible, and What is Practical?

Questions for Users	Questions for Vendors	Questions for IS
<ul style="list-style-type: none"> • Are you bringing your own mobile device, or will you use a corporate device? • Are you willing to let the corporation place MDM software on your device? • Are you willing to undergo user training? • Will you sign a policy document? • Will you limit the applications running on the device to those deemed appropriate by the corporation? • Will you allow the corporation to delete applications and data from the device? 	<ul style="list-style-type: none"> • Is your mobile application C/S or browser-based? • Which devices, operating systems, and release levels are you supporting? • What mobile application development environment are you using? • Is any PHI stored on the device; and, if so, how is it being protected? • Is your application compatible with or dependent on MDM? • Does your application have multi-factor security? • Does you have a single sign-on solution? • Who are your mobility partners? 	<ul style="list-style-type: none"> • Do you have the staff, skills, and resources to support multiple devices, operating systems, wireless technologies, middleware and applications? • Will you allow user-owned devices to directly connect to the network? • Will you limit user device access to browser-based applications only? • Will you be segmenting employees, execs, and clinicians? • Have your attorneys provided advice on the liability and tax consequences of deploying mobile devices and applications to users?

Summary: A Health Care Mobility Roadmap

Mobility Helps Put the “Use” in MU and Enables BPM...

Meeting User Needs in a Controlled Fashion



The Advisory Board Company at HIMSS12

Booth #7310

Pick Up the Just-Released Publication

The Health Care IT Top 10: Upping Your Act, Again, in 2012

The Guide will be released on Monday, February 20, 2012 at HIMSS12 Annual Conference in Booth #7310 and copies are limited. You may pre-reserve a copy by emailing Leah Bruch at bruchl@advisory.com

Surf our Virtual Library of this Year's Most Requested Research

View and download this year's most requested research from the IT Strategy Council and Applications and Technologies Collaborative on evaluating critical applications, disruptive technologies and IT solutions related to government mandates and transformative healthcare delivery models

Attend our Education Session: Guiding Clinicians Toward Accountability with Clinical Decision Support

*Wednesday, February 22, 2:15 PM - 3:15 PM
(PST) | Lecture #116*

Recognize the principles of effective design, implementation and management of CDS

Learn About Accessing Membership

Talk to a member services advisor and learn more about this year's research agenda and accessing membership