

Telehealth, Connected Health, mHealth, eHealth, vHealth, etc.

Arun Ravi

March 22, 2011

"We Accelerate Growth"

© 2011 Frost & Sullivan. All rights reserved

Healthcare Paradigm Shift

Multiple concurrent shifts in healthcare provision globally

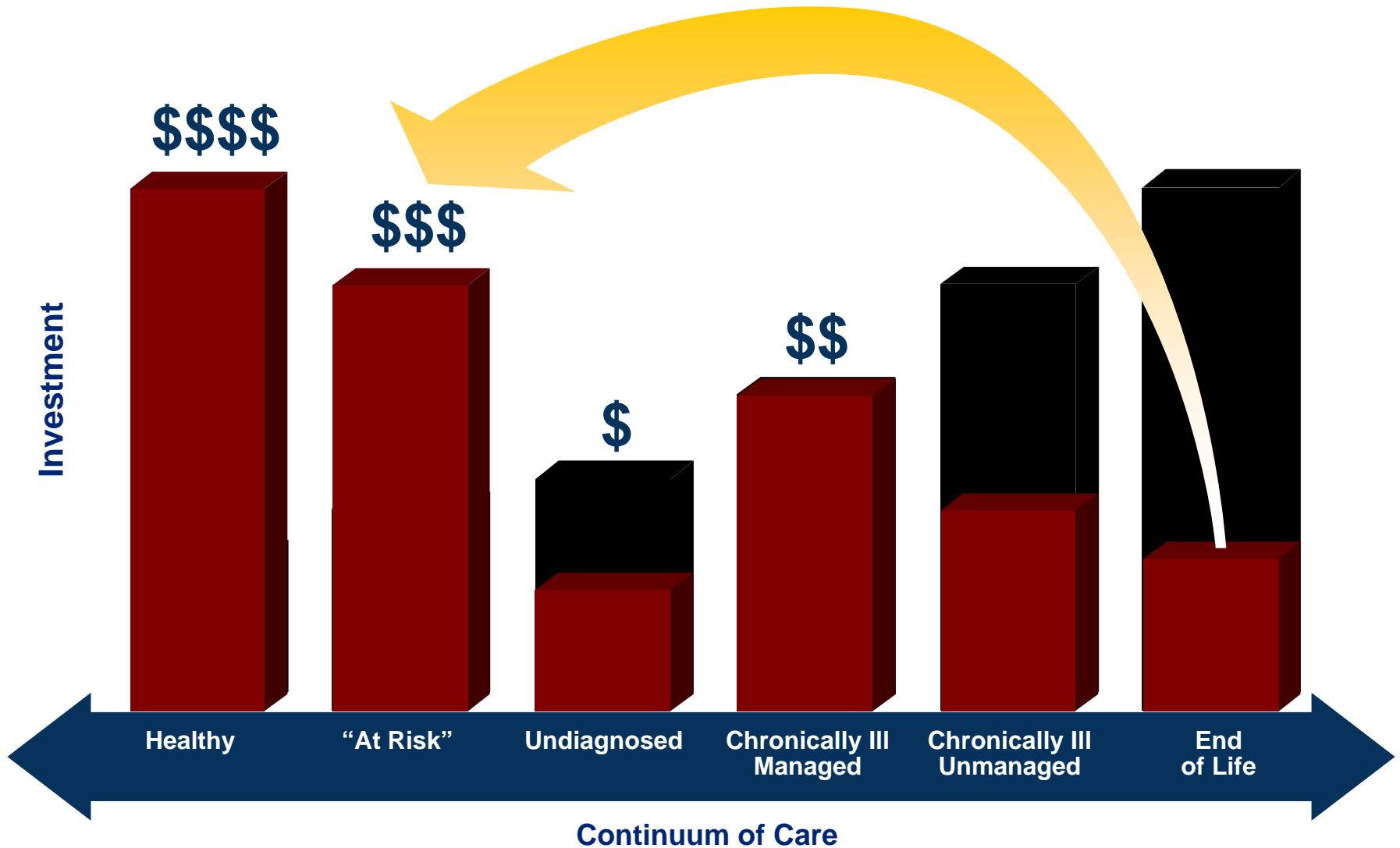
From...



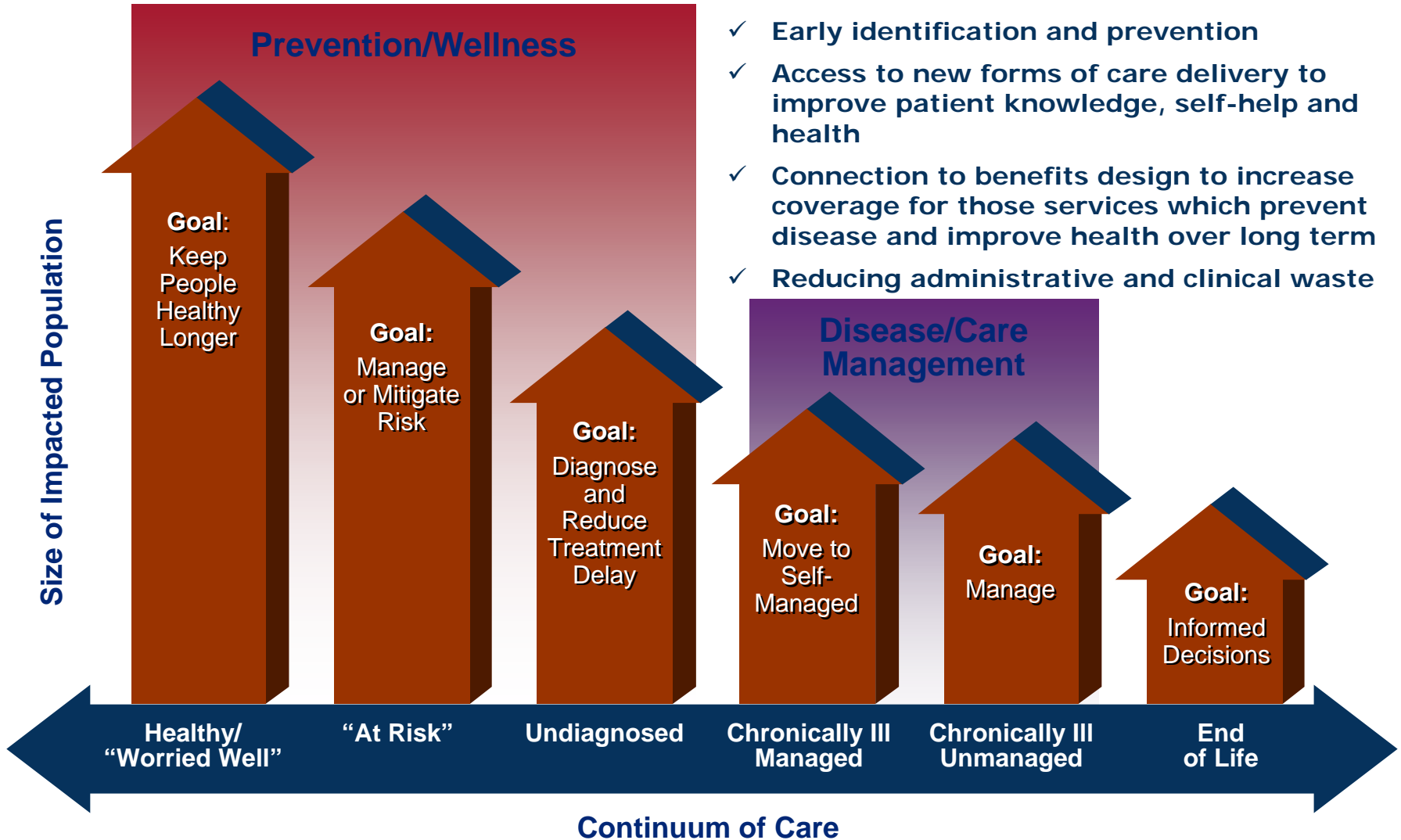
...To

One Size Fits All	Approach	Personalized Medicine
Fragmented, One-way	Patient Info Flow	Integrated, Two-way
Provider Centric	Focus	Patient Centric
Centralized – Hospital	Monitor	De-Centralized – Shift to Community
Invasive	Treatment	Less Invasive, Image-based
Procedure-based	Reimbursement	Episode-based, Outcome-based
Treating Sickness	Objective	Preventing Sickness – “Wellness”

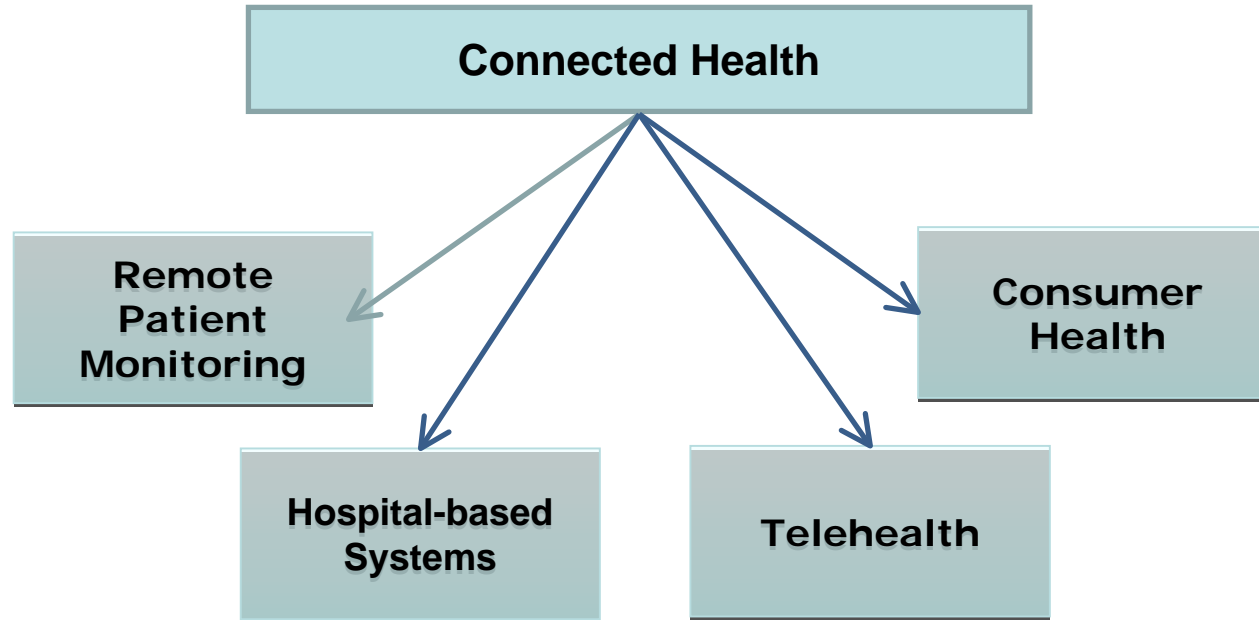
Shifting the Financial Gravity of the System



Shifting the Health Focus of the System



Technology Driving New Connected Health Solutions



Shifts Underway to Support Remote Access and Tracking

CMS support

- “The use of a telecommunications system may substitute for a face-to-face, “hands on” encounter for consultation, office visits, individual psychotherapy and pharmacologic management.”
- “Each of these categories is ‘not considered telemedicine’ or ‘telemedicine’ by CMS. Rather, they are considered the same as services delivered on-site and are to be coded and will be paid in the same way.”

More emphasis on diagnosis, monitoring, preventative care

Track and document outcomes

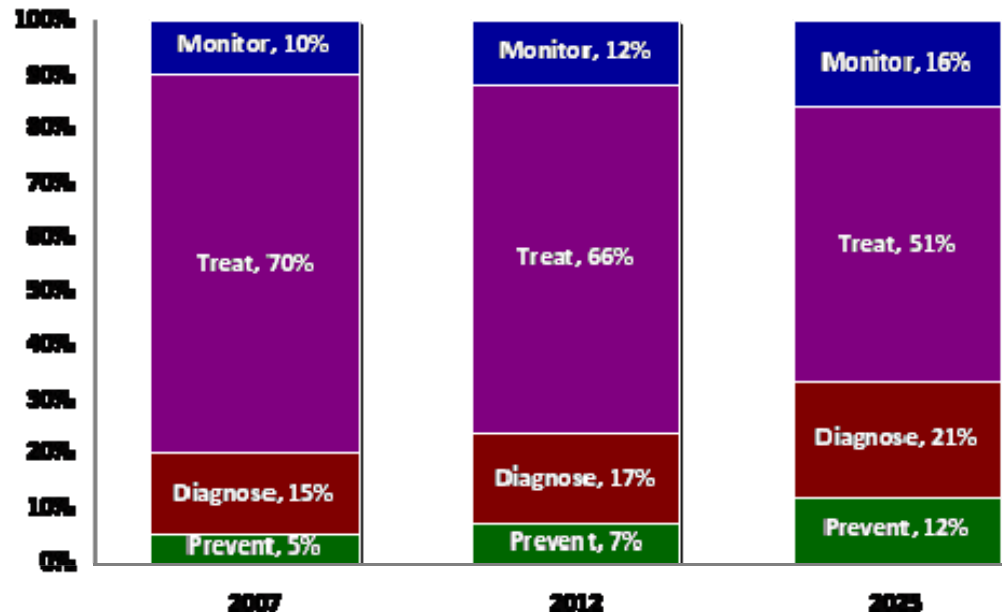
Greater info flows to support training, patient education/interaction

Requirement to reimburse

States that mandate telemedicine reimbursement by private insurance:

- | | |
|---------------|-----------|
| Virginia | Hawaii |
| Maine | Kansas |
| New Hampshire | Kentucky |
| Oregon | Louisiana |
| California | Texas |
| Colorado | Oklahoma |
| Georgia | |

Healthcare Spending by Type of Activity



Connected Health Solutions Create Access + Convenience

- Increase reach of specialists
- Extend access to care to remote sites/locations
- Remote individual access to data
- Push info to patient, increase interaction with patient
- Patient ability to schedule, request info from HC provider
- 24 / 7 real time ability to input / output info
- Physician interaction with info not location bound



Fixed health → Portable health → Mobile health
What interaction, where on this continuum?

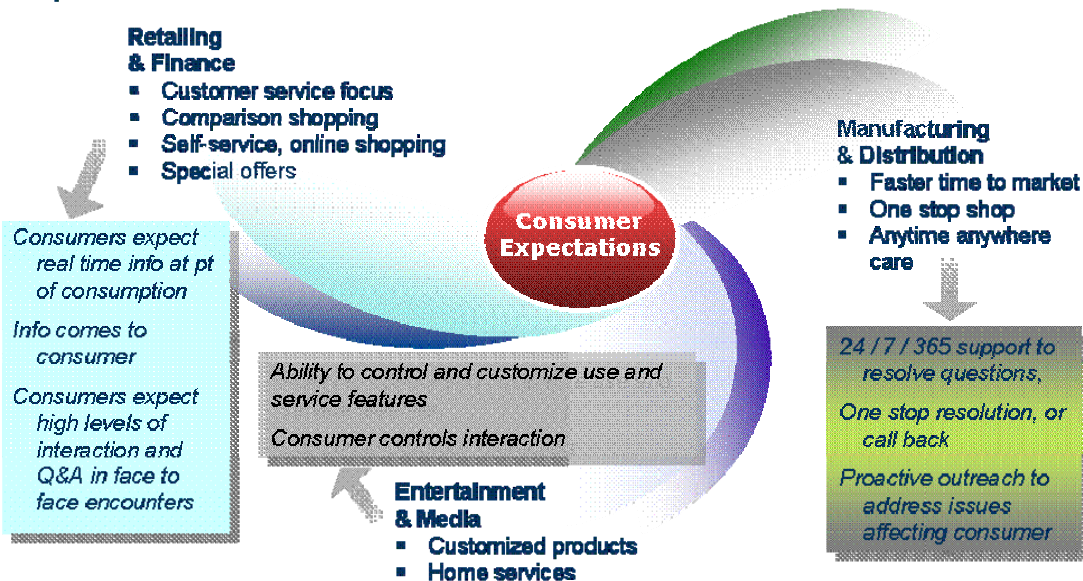
Connected Health Solution Success Based on Alignment With Stakeholder Goals, Perceived Benefits

HCP benefits

- See more patients
- Influence patient behavior change
- Improve outcomes
- Leverage patient support system – wider caregiver group, family, etc.



Consumer experiences in other markets affecting expectations from healthcare:

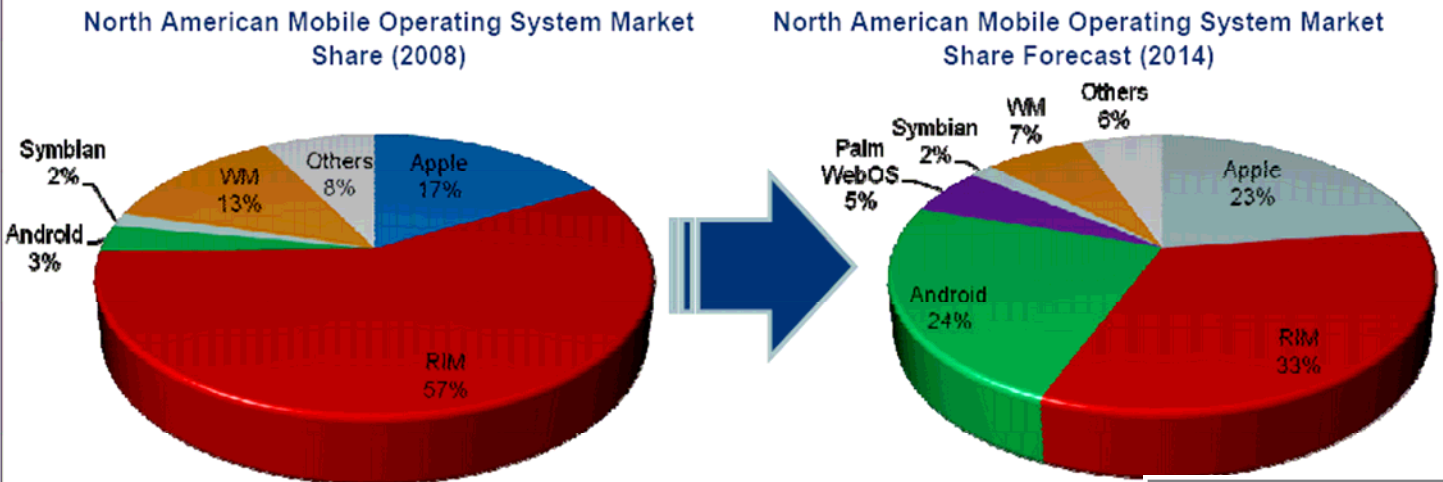


Patient benefits

- Convenience, control of timing
- Increased interaction on demand
- Immediate access to system, info
- Behavior change
- Ability to support family health

Smart Phones the Platform of Choice for Future Connected Health Apps?

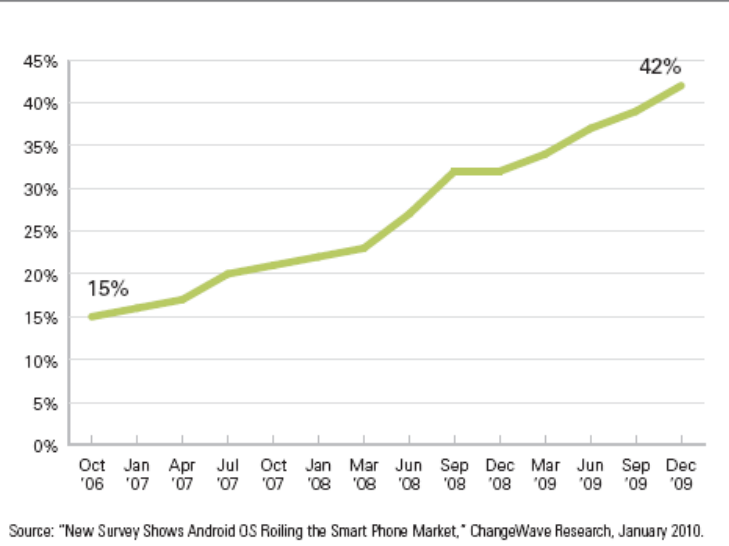
North America Smartphone OS Market Share Forecasts



Source: Frost & Sullivan

Penetration of smartphones even higher among physicians → 63% of physicians own smartphones, expected to rise to 81% smartphone penetration among physicians by 2014*

*Manhattan Research = "Physicians in 2012: The Outlook for On Demand, Mobile and Social Digital Media"



Best Practices

Look for systems, not technology

- Multiple contact methods, follow up channels
- Monitor + engage
- Support increasing patient-provider interactions



Can't use tech to jump value chain →
Can increase info and interaction within value chain:
Providers (many layers) ↔ Payers ↔ Patient, Family

Learn from other industries where mobilizing processes is successful

Must solve problems of individual user holding the device

- Convenience
- Efficiency
- Knowledge pushed to the edge



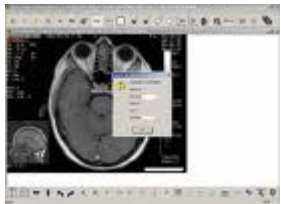
Regulatory Issues Impacting mHealth: Medical Device Needing Approval?

Med device definition is broad: a “gizmo” that treats, diagnoses, mitigates or prevents disease or injury



FDA has stated the stand-alone software is NOT a medical device

but...



Stand-alone software has been regulated for years (e.g., PACS)

and...

In EU, regulators state stand-alone software CAN be considered a medical device

so...

Conclusion = IT DEPENDS

Both the FDA and the EU have stated clarity is coming ...
under evaluation



Which Apps Will the FDA Have More Interest In?



Risk will likely determine regulatory response

If doctor bases medical decision on this data, or provides support for medical decision = medical device? “NOT DETERMINED YET”

FDA has stated that the status of mHealth application guidance
“still a matter of discussion”
“under development”
more guidance in coming months

FCC overtly encourages mHealth exploration and device innovation, support for test beds
Big issue for FCC is (frequency) interference

Cool Solutions: American Well

- Immediate, live interaction between patients + available physicians:
video, phone, chat
Agreements with 6 payers in 9 states: HI, MN, NY, CA, TX, FL, CO, IL, NJ
- Connect with an available provider
- Park on a busy provider and wait for availability
- Schedule a future visit with an offline provider
- Physician sees info on complaint, condition, meds, allergies, procedures, immunizations

The screenshot displays the American Well website's 'Matching Providers' section. At the top, the user is logged in as Katherine L. Smith. The search criteria are: OBGYN, Speaks English, Video Capable, Web, Can prescribe electronically, Licensed in my state. The search results show three providers:

- Otto Matic, OBGYN**: Status: AVAILABLE. Gender: Male. Location: Brookline, MA. Supports: Phone, Web, Video Capable. Languages: English, Spanish. Action: CONNECT NOW.
- Juanita Phillips, OBGYN**: Status: AVAILABLE. Gender: Female. Location: Brookline, MA. Supports: Phone, Web, Video Capable. Languages: English, Spanish. Action: CONNECT NOW.
- Sara Beth Karp, OBGYN**: Status: BUSY. Gender: Female. Location: Brookline, MA. Supports: Phone, Web, Video Capable. Languages: English, Spanish, Hebrew. Action: Enter Waiting Room.

- Real-time 2-way mobile video calling and collaboration
- Client-server solution
- Device agnostic – can connect any combo of endpoints: laptop/iPad, smartphone, branded videoconf equip (Polycom, Tandberg, etc.)
- Seamless handoff between devices
- Flexible user license structure
- Collaboration tool to whiteboard, markup images, etc.



Cool Solutions: Vitality GlowCaps

- Medication adherence solution involving easily deployed, low cost hub
Simple, cheap, multimodal interaction, scalable
- Basic service is a reminder, with follow up escalation to various levels of interaction
- Addresses several root causes of nonadherence: forget, social support, cost, belief in med regimen, health literacy, etc.
- Behavioral economics
- Analytics on adherence by location, physician, condition, medication
- Pharmacy coordination



FROST & SULLIVAN

Arun Ravi

Practice Leader, Healthcare IT

Healthcare & Life Sciences

(650) 475-4555

Arun.ravi@frost.com



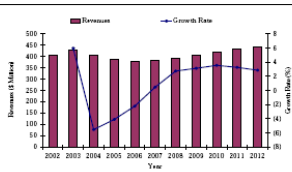
FROST & SULLIVAN

Frost & Sullivan

An Active Contributor to Global HC Market Development

Comprehensive Supply-side Analysis

CHART 3.5
Chain Terminator DNA Sequencing Market: Revenue Forecasts (U.S.), 2002-2012



Note: All figures are rounded to the base year in 2008. Source: Frost & Sullivan

Figure 3.6 and Chart 3.6 show the revenue forecasts by application for the U.S. chain terminator DNA sequencing market from 2002 to 2012.

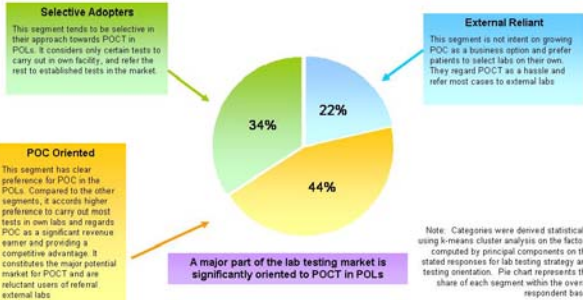
FIGURE 3.6
Chain Terminator DNA Sequencing Market: Revenue Forecasts by Application (U.S.), 2002-2012

Year	Discovery and Validation (\$ Million)	Clinical Research (\$ Million)	Commercialized Applications* (\$ Million)
2002	305.0	69.6	29.1
2003	320.6	74.0	32.3
2004	292.4	75.4	36.5
2005	271.3	77.3	39.0
2006	256.7	80.2	42.2
2007	248.7	84.9	47.3
2008	243.1	93.7	54.6
2009	237.2	105.0	61.6
2010	232.3	115.9	69.8

Robust End-user Analysis

Derived Market Segments based on Lab Testing Orientation

This provides an overview of the differences in the selection criteria of the three derived segments of customers.



Q.1a Please indicate to what extent you would agree or disagree that the following statements represent your practice's orientation towards testing



Recognizing Best Practices

Strategic Expert Analysis

Hosting Industry Forums

Thought Leadership

Por esta época usted recibe muchas agendas y calendarios. En ellas puede incluir, desde ya, esta nueva cita.



FROST & SULLIVAN

Healthcare & Life Sciences

Vital Signs

Strategic Insights for Healthcare Executives

July 7, 2008

This Week's Industry Focus:
Drug Discovery and Clinical Diagnostics

Personalized Biomarkers: From Drug Discovery to Diagnostics, Therapeutics, and Monitoring

Author: Dr. Sudeep Basu, PhD, Senior Research Analyst, Drug Discovery and Clinical Diagnostics

The buzz around the word "biomarker" lends one to believe that it's a relatively recent concept. Alternatively, biomarkers are not new to healthcare. For example, body temperature and blood glucose levels can be considered as biomarkers. More definitively, a biomarker is simply a parameter; it could be molecular, physical, or biological indicator of the human body "system" – an indicator of a physiological state. A biomarker can indicate when an individual can be considered at a normal healthy state or progressing towards or in a disease state.

Historically, the use of biomarkers in the pharmaceutical industry has been for toxicology studies or preclinical toxicity studies. Biomarkers have evolved tremendously; today, there is a need for biomarkers in both the preclinical stages and the clinical development phases. Moreover, biomarkers are employed for the selection of populations that participate in studies; biomarkers in the FDA.

FROST & SULLIVAN

4th Annual Patient Adherence Congress
Proven Strategies for Today...Emerging Strategies for Tomorrow

A Frost & Sullivan One Day Congress

By Invitation Only



Thursday, March 5, 2009 | The Union League | Philadelphia, PA

In Cooperation With:

