How New Technology Will Transform the Disease Management Process

2004 Disease Management Colloquium

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Health Technology Center
www.healthtech.org
Disrupting like the Roomba...
“Mrs. Marshall, get on the scale...”
The Vision
Advancing the use of new technologies to make people healthier.

The Mission
To create a trusted source of expert information about the future of healthcare technologies.

The Means
A nonprofit pooled research center for delivery systems and health plans. Funding independent of developers and vendors of technology.
Ascension Health
Banner Health
Baylor Health Care System
Bon Secours Health System
CAPH
Carolinas HealthCare System
Catholic Healthcare West
Chinese Hospital and Health Plan
Centers for Medicare and Medicaid Services (CMS) Federal Liaison
CHRISTUS Health
El Camino Hospital
Greenville Hospital System
Group Health Cooperative
Health Alliance for Greater Cincinnati
Hudson Health System
John Muir/Mt. Diablo Medical System
Kaiser Permanente
Lenox Hill Hospital
Lumetra
Medisys Healthcare System
Methodist Health System
Mills-Peninsula Health Services
Overlake Hospital Medical Center
Parkview Health
Partners HealthCare System
PeaceHealth
Premier, Inc.
Presbyterian Medical Services
Providence Health System
The Queen’s Medical Center
Ryan Community Health
Sequoia Healthcare District
Sutter Health
Texas Health Resources
UC-Davis Health System
VHA, Inc.
Veterans’ Health Administration
WellPoint Health Networks
Innovation Is An Unnatural Act
268 Years Later...
Forces Driving Toward the Tipping Point

- The American health care delivery system is in need of fundamental change. The current care systems cannot do the job. Trying harder will not work. Changing systems of care will.
  
  IOM: Crossing the Quality Chasm

- RAND: Almost half of all patients get sub-standard care

- IOM et al: One-third of healthcare expenditures are waste
IOM: Recommended Actions

- Chief external levers for change:
  - Support investment in information technology
  - Reform payment systems
    - Stop penalizing physicians and hospitals for quality improvement
    - Reward the behaviors and results you want

- Establish standards for clinical data exchange

- Remove legislative and regulatory barriers
  - Stark
  - Anti-trust
HHS Leadership Breaks New Ground

Secretary Thompson:

- “Grocery stores are more automated than healthcare”
- Announced Federal agencies will lead in adoption of data standards – *using purchaser clout to drive the market*
- Medicare Modernization Act of 2003 – IT provisions
- Would use half of $1.2 billion in fraud and abuse settlements for hospital IT investments
- Asked IOM, HL7 to define, develop standards for EHR functionality

President Bush:

- Executive Order
- National Healthcare IT Coordinator
- Reimbursement incentives
- Data exchange and connectivity
Gridlock beginning to loosen...

- Regional Data Exchanges
  - NEHEN, Indianapolis, Santa Barbara
- Federal Investment
  - $150 m in 2004 budget, other legislation pending
  - HealthTech Policy Recommendation: Spending Our Money Wisely
    - Endorsed by HIMSS, NAHIT
    - eHealthInitiative Coalition: Investing in America’s Health
- Reimbursement
  - CMS demos
  - IOM proposed work on payment reform options
- Employer, Coalition Voices:
  - Leapfrog
  - NEHI: Advanced Technologies to Lower Health Care Costs and Improve Quality
- Health Plans enter the fray:
  - Wellpoint distribution of IT/e-prescribing to 19,000 physicians
  - Disease Management – third generation
  - Relay Health – structured messaging between physician and patient
Better, cheaper care

- Joint findings: New England Healthcare Institute (NEHI), Massachusetts Technology Collaborative November 2003
  - Electronic communication between patients and their physicians
  - Electronic prescribing
  - Ambulatory computerized physician order entry
  - Inpatient CPOE
  - Regional data sharing
  - Intensivist onsite 24x7 in ICUs
  - Disease management

- *Projected net annual benefit (75% adoption rate) for Massachusetts of $2.48 billion*
  nehi.net, November 2003
Increased workforce productivity

Our Partners are Adopting:

- Communication
  - Vocera – wireless workforce communication tool
- Cost of labor
  - Service robots for delivery of materials
  - Point of care laboratory testing
- Throughput
  - Remote video translation services in ED
  - e-ICU
- Telemedicine services for institutionalized patients
- Passive RFID
- PACS-enabled reorganization of radiology services
Improved business processes

• Facility planning
  – 20-40% expansion in hospital capacity
  – No coordination between IT, facilities
  – Clinical process changes enabled by IT

• IT support for clinical devices
  – Emerging devices are unique combinations
  – Require real-time reading, action
  – Where will the ‘hub’ be built?
## Better, Cheaper Care

### Home-based Telemedicine for Uninsured, High-risk Diabetic Population

<table>
<thead>
<tr>
<th>Category</th>
<th>Change</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient Admissions</td>
<td>↓</td>
<td>32%</td>
</tr>
<tr>
<td>Emergency Room Encounters</td>
<td>↓</td>
<td>34%</td>
</tr>
<tr>
<td>Outpatient Visits</td>
<td>↓</td>
<td>49%</td>
</tr>
</tbody>
</table>

*(Diabetes Technology & Therapeutics Journal, 2002)*

### Asthma Self-management for High-risk Pediatric Population*

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<thead>
<tr>
<th>Category</th>
<th>Change</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity Limitation</td>
<td>↓</td>
<td>(p = .03)</td>
</tr>
<tr>
<td>High Peak Flow Readings</td>
<td>↑</td>
<td>(p = .01)</td>
</tr>
<tr>
<td>Urgent Calls to Hospital</td>
<td>↓</td>
<td>(p = .05)</td>
</tr>
</tbody>
</table>

*(Arch Pediatr Adolesc Med. 2002)*

### Care Coordination: Hypertension, Heart Failure, COPD, and Diabetes*

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<th>Change</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Room Visits</td>
<td>↓</td>
<td>40%</td>
</tr>
<tr>
<td>Hospital Admissions</td>
<td>↓</td>
<td>63%</td>
</tr>
<tr>
<td>Hospital Bed Days of Care</td>
<td>↓</td>
<td>60%</td>
</tr>
<tr>
<td>Nursing Home Admissions</td>
<td>↓</td>
<td>64%</td>
</tr>
<tr>
<td>Nursing Home Bed Days of Care</td>
<td>↓</td>
<td>88%</td>
</tr>
</tbody>
</table>

*(Disease Management, 2002)*
Find Your Starting Position...

Diffusion of Technology

- Innovators (2.5%)
- Early Adopters (13.5%)
- Early Majority (34%)
- Late Majority (34%)
- Laggards (16%)

Year

2003

Everett Rogers, Diffusion of Innovations, 1995
Closed-loop implants for cardiac disease

Broward County
Condition: 428-HEART FAILURE; Technology: Closed-loop implant;
Market Availability Year: 2006; Implementation Year: 2008; Full Impact Year: 2010
Delivery System Concerns

- Reduction in revenues:
  - Decrease in physician visits
  - Decrease in ED, hospital admissions
- Patient redirected to participating system
- ED Management of patients with devices
  - Preparing for interface of devices, services, office EMR and IT
- Cultural issues of physicians and patients
  - Training for personnel
  - Threat of negative perception (low quality) for non participating providers
  - Adequacy of reimbursement for participation in program
- Physician network relations
Physician Group Concerns

- Reduced revenue from office visits and follow up calls
- Possible loss of patients to carve out network
- Perceived “interference” with patient management
- Capital cost of installing IT capacity to link electronically to care management program
- Care management program operations
  - Quality of service provided by program
  - Ability to incorporate patient information from care management program with physician records
Health Plan Concerns

- **ROI**
  - Patient disenrollment before initial investment recouped
- Costs of Emergency Care
- Quality of carve out programs

- **Efficacy**
  - Differentiator in the market place (adverse selection)
  - Lack of CMS reimbursement
  - Promoting physician adoption

- Patient selection
Problems with Managing Chronic Disease

Data

People

Business
Data and Chronic Disease Management

Data Challenges…
- Accuracy
- Collection
- Access
- Presentation

What Technology Can Do…
- Improve quantity, accuracy and quality of data
- Reduce error
- Enhance data access & exchange
- Process and display in a more palatable way
People and Chronic Disease Management

People Challenges…

- Behavior Modification
- Coordination of care
- Culture
- Trust
- Workforce

What Technology Can Do…

- Improve coordination and communication
- Provide feedback
- May even build trust
- Support decision making
Business and Chronic Disease Management

Business Challenges:
- Poor efficiencies
- Alignment of incentives
- Ability to demonstrate ROI
- Reimbursement
- Population Stratification

What Technology Can Do…
- Increase efficiency
- Provide economies of scale
- Improve process
## Monitoring and Measurement: Technologies

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Emerging Technologies (0-5 yrs)</th>
</tr>
</thead>
</table>
| • Data accuracy, quality and quantity | • POC Lab testing *(iStat, Roche, Litmus Concepts)*  \  
|                                     | • Sensors: Implantable & Transdermal *(Medtronic)*  \  
|                                     | • Mobile Computing *(Palm, HP, Toshiba)*  \  
|                                     | • Robotics *(InTouch)*  \  
|                                     | • Remote Technologies: monitoring, management, and messaging *(Relay Health, Agilent, Welch Allyn)*  \  
|                                     | • Wireless: motes *(Intel, Dust)*  \  
|                                     | • Internet “port” *(iMetrikus, HealthConnex)*  \  |
| • Self-assessments not accurate     | • Wireless: motes *(Intel, Dust)*  \  
| • Costly to transcribe              | • Remote Patient Management *(HealthHero, HomMed, American Telecare)*  \  |
| • Cognitive status difficult to determine |                                                                                         |
### Monitoring and Measurement: Technologies (continued)

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<tr>
<th>Challenges</th>
<th>Emerging Technologies (0-5 yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Shortage of skilled staff</td>
<td>• Mobile Computing <em>(Palm, HP, Toshiba)</em></td>
</tr>
<tr>
<td>• Cost</td>
<td>• Wireless <em>(Major service providers)</em></td>
</tr>
<tr>
<td></td>
<td>• Remote Patient Monitoring <em>(American Telecare, HomMed)</em></td>
</tr>
<tr>
<td></td>
<td>• Point-of-Care Testing <em>(iStat, Roche, Litus Concepts)</em></td>
</tr>
<tr>
<td>• Data accuracy</td>
<td>• Data mining of pharmacy information <em>(Health Audit)</em></td>
</tr>
<tr>
<td></td>
<td>• Drug &amp; detector combinations <em>(Sequella)</em></td>
</tr>
<tr>
<td></td>
<td>• Graphic presentation of progress and status <em>(Accordant, Cor Solutions, American Health Patways, iMetrikus)</em></td>
</tr>
<tr>
<td></td>
<td>• Reminder devices and systems <em>(MedReminder, Cadex, MedReadt)</em></td>
</tr>
<tr>
<td></td>
<td>• Integrated Device &amp; Web Portals <em>(iMetrikus, Cerner, Welch Allyn)</em></td>
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</table>
Monitoring and Measurement: Forecast

• Greatest area of technical development
• Large improvements in sensors
• **Implantables** will provide revenue potential for physicians and third party call centers
• **Comprehensive monitoring will be a challenge** for patients with multiple co-morbidities.
• **Data stream integration** will be of increasing concern
• **Call centers** will proliferate.
• **Personal baselines** will emerge as trend in managing chronic disease
• **Motes** progressing rapidly
• **Gateway products** will proliferate

• **Personal cognitive baselines**
Monitoring and Measurement: Forecast (continued)

- These will be enabling technologies
- Aspects of care will increasingly be shifted to the patients and caregivers

- Growth area
- Integrated Web portals
- Drug & detector: Gating factor is Pharma
- Pill bottle systems will diffuse slowly due to costs and logistics
- Other gating factors: Cost, flexibility for disease management process, and demonstrated ROI
Underinsured and Scared
Billy Beane: The Innovator’s Solution

Read Moneyball !!

- Invested in players most others passed on
  - Used statistics – on-base percentage, not slugging
  - Ignored the scouts
  - Tested for success in the hinterlands

- The technology is disruptive, but the implementation will often be incremental – until the tipping point is reached

- Find and invest in early adopters

- Michael Moritz (Sequoia):
  “It takes a long time to build a company of value.”

- IT, and IT-enabled devices, are the only counter to rising demand and costs in devices, pharma and biotech