HIT in Chronic Care

Really Cool Stuff...

Speeding Up a Broken Process?

March, 2007

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Introduction

• Chronic care IT not about standards, interoperability, exchange, or RHIOs,

• Chronic care IT about tools to care for patients

• Confronts the business problem: no new money

• Confronts the broken health care system
Introduction

• Broken health care system
  – Costs out of control
  – Wide variation & unreliable quality

• Opportunities abound
  – 30% of care is unnecessary
  – 30% of the remainder is muda (waste)

• IT-enabled business process reengineering
  – In the chronic care category
IT-Enabled Business Process Reengineering

- Not a technology problem
- A business / system problem
- No new money
- Chicken-egg problem
  - No new expensive toys
  - Need IT for the reengineering
Major Chronic Diseases
- Diabetes [16 million]
- Heart disease (CAD, CHF) [18 million]
- Lung disease (Asthma, COPD) [30 million]

Others
- Arthritis/back pain
- Obesity/metabolic syndrome
- Hyperlipidemia
- Depression
- Some cancers
300 Million Americans

- **Healthy**: 170 M, 57%
- **Acutely ill**: 60 M, 20%
- **Moms & Babies**: 6 M, 20%
- **50 million: Chronic Illness**: 50M, 17%
- **Severe Disability**: 7 M, 2%
- **End of Life**: 7 M, 2%

Source: HHS
Total Health Care Costs = $1.7 Trillion

- Acutely ill: $600M, 34%
- End of Life: $320M, 19%
- Healthy: $120M, 7%
- Moms & Babies: $60M, 4%
- Severe Disability: $250M, 15%
- $350 million: Chronic Illness

Source: HHS
The Vision – Star Trek Utopia

(Technology is here today)

• Communication channels
• Remote monitoring devices
• Back-end support
  – Decision support, data analysis
  – Content & algorithms
  – Workflow apps, registries
  – EMRs, PHRs, HRAs
Remote Monitoring on Starship Enterprise
Chronic Care Applications

Engage

Intervene

Monitor

Personal assessment tools (HRA)

Educational tools (websites, audio library)

Remote monitoring (biometric, tele-monitoring)

Case Management Call Support

Personal Health Record

Patient-provider communication tools (IVR, e-mail)

Clinical integration tools

Decision support tools

Disease Registry

Electronic Medical Record

Workflow Applications

Patient Focused

Provider Focused

Source: Disease Management Association of America
More Chronic Care Applications

- System focused (parameter upload)
  - Push F7 to upload quality data
  - Push F8 to upload cost data
  - Push F9 to upload syndromic surveillance
The Technology

- Communication channels
- Remote monitoring devices
- Back-end support
  - Decision support, data analysis
  - Content & algorithms
  - Workflow apps, registries
  - EMRs, PHRs, HRAs
Communication Modes

- **Synchronous**
  - cellphone, chat, video conf, walkie-talkie

- **Asynchronous**
  - Unstructured
    - Email (secure or not), SMS text, IM messaging
    - Web posting
      - Text, rich images, multimedia, video
  - Structured Web visits & requests
Communication Channels

• Patient – care team channel
  • Scheduling appointments
  • Prescription refills
  • Online consultation
  • Requesting referrals
  • Receiving routine test results
  • Content push--
    • Care plan reminders & instructions
    • Treatment options
    • Motivational
Hello Christina

Welcome to your home page. Use the options on the left to begin a message to your doctor. You will be notified at your email address listed below when your doctor’s reply is ready. Use this service only for non-urgent communications.

New Messages

- RE: Schedule Appointment
  - Kathryn Jones, MD
  - Aug 10, 2004

- Medication Renewal
  - Kathryn Jones, MD
  - Aug 10, 2004

Reminders

- Add a Doctor to your list of doctors
- Add a family member to your account

Health Records

- Christina King
  - cking@nomedia.com
  - Aug 10, 2004

- Scott King
  - cking@nomedia.com
  - Aug 10, 2004
Communication Channels

- Team – team channel
  - Care plans
  - Specialist referral (cellphone, chat, video)
  - Transfer of care
  - Registries, visit summaries, even chat and cell phone for real time specialist consultation.

- Other channels to family, case manager, other practitioners & technicians
Communication Channels

• Channel to outside environment
  – Payer / purchaser for benefits
  – To performance monitoring entity
  – To syndromic surveillance monitoring bodies
Remote Monitoring

- Seamless / realtime / wireless
- Blood sugars
- Peak flow & O2 Sat
- Weights
- Falls
- Blood Pressure
- Pill box monitors
- Future: lipids, HbA1c, INR, any variable worth monitoring
Remote Cardiac Monitoring

• **Boston Scientific Latitude®**
  – wireless defibrillator readings (+battery level)
  – Includes wireless BP device, scale

• **Medtronic Chronicle®**
  – Intracardiac (RV) pressure, temperature, patient activity, heart rate
  – Clinicians view data on secure Web site
Health & Wellness
One billion adults overweight worldwide

In the future...
• Extension of healthcare system into the home
• Initial triage of conditions
  • Vital signs
  • Images
• Appointment scheduling

Health & Wellness
• Weight loss
• Fitness
• “Worried Well” vital sign monitoring:
  • Weight
  • Blood pressure
  • Glucose
  • Cholesterol
  • Activity level
• Personal Health Records

Healthy family

Internet

Weight loss and fitness coaching

Healthcare Professionals

Personal Health Record

Digital Home

Blood-pressure Cuff
Glucose meter
Pedometer
Weight Scale
Fitness equipment
Medication Tracking
Disease Management

860 million chronic disease patients worldwide

- Chronic disease
- Post trauma
- Pre-op

Disease Management
- Vital sign monitoring (RPM)
- Medication reminders and compliance
- Utilize home network to locate devices in logical places:
  - Scale in bathroom
  - Pill minder in kitchen
  - BP cuff in living room
- Trend analysis and alerts
- Email, chat, video
- Appointment scheduling

Family caregivers

Disease management service

Healthcare provider

Personal Health Record

Regence
**Elderly Monitoring**
600 million elderly individuals worldwide

**Aging Independently**
- An adult child helping their elderly parents age gracefully in their own home.
- Basic life monitoring as appropriate (ADL):
  - Bed pressure (sleep)
  - Bathroom sensor
  - Gas / water sensor
  - Emergency sensor
- Vital sign monitoring (RPM)
- Medication reminders and compliance
- Trend analysis and alerts
- Email, chat, video
- Appointment scheduling

**Family care givers**
- Elderly monitoring service
- Diet & wellness services
- Disease management service, healthcare provider

**Digital Home**
- Internet
- Personal Health System
- Cell Phone
- PC
- Home Automation & Control
- Pedometer
- Weight
- Pulse Ox
- Blood pressure Cuff
- Fitness equipment
- Medication Tracking
Personal Health Eco-system

**SENSEs**
- Home sensing & control
- Bed / Chair Sensors
- Implant Monitors
- Baby Monitors
- Consumer Electronics
- Fitness equipment

**CONNECTIVITY**
- Ethernet
- ZigBee™
- Bluetooth
- USB
- z-wave
- WiFi

**AGGREGATION**
- PC
- Personal Health System
- Cell Phone
- Set Top Box

**COMPUTATION**
- MICS / MEDS
- Glucose Meter
- Blood-pressure
- Pulse Oximeter
- Spirometer
- Weight Scale

**SERVICES**
- Healthcare Provider Service
- Disease Management Service
- Diet or Fitness Service
- Personal Health Record Service
- Implant Monitoring Service
Back-End Applications

- **EMRs & registries**
  - Chronic Disease Management Systems
    - Standalone -- DocSite, i2i Systems
    - CDM integrated w EHR – Epic, Allscripts, others

- **Guideline management**

- **Care plans / decision support**

- **Alarms**
Back-End Applications

• **Workflow apps**—
  – Predictive modeling / outreach
    • DxCG, Impact Pro
  – Call center management
    • DM firms -- Healthways
  – Clinical CRM
  – ERM & document management

• **Business Intelligence**
  – Incl Quality / ETG analysis
Reality -- Disarray in Chronic Care

- Episodic care model from 50 years ago
- Constant in-office MD supervision of chronically ill now required
- Care provided in offices, schools, home, at work; by MDs, nurses, techs, and diverse therapists
- Spotty evidence-base for care decisions
- And only 45% get that right
The Prevailing Vision of Technology Adoption in Healthcare:
“Pimp My Ride”

The IOM Vision of Tech Adoption:
Nordstrom + Mayo Clinic + E*TRADE

Source: Ian Morrison
Pimp My Ride Health Care

- Really Bad Chassis
- Unbelievable amounts of high technology on a frame that is tired, old and ineffective
- Huge expense on buildings, machines, drugs, devices, and people
- People who own the rides are very grateful because they don’t have to pay
- It all looks great, has a fantastic sound system, and nice seats but it will break down if you try and drive it anywhere
- Chronic care the perfect new pimp my ride

Source: Ian Morrison
Variations in spending
Content of care -- three categories

Effective care: Evidence-based services that all patients should receive. No tradeoffs involved.

- **Acute revascularization for AMI**

Preference-sensitive care: Treatment choices that entail tradeoffs between risks and benefits. Patients’ values and preferences should determine treatment choice.

- **CABG for stable angina**

Supply-sensitive services: Services where utilization is strongly associated with local supply of health care resources.

- **Frequency of MD visits, specialist consultations use of hospital or ICU as a site of care, tests, imaging and minor procedures**
Ratio of Use Rates in High vs Low Spending Regions -- in similar patients
If dot is to right, high spending regions get MORE

Effective Care: *technical quality*
- Reperfusion in 12 hours (Heart attack)
- Aspirin at admission (Heart attack)
- Mammogram, Women 65-69
- Pap Smear, Women 65+
- Pneumococcal Immunization (ever)

Preference Sensitive Care: *elective surgery*
- Total Hip Replacement
- Total Knee Replacement
- Back Surgery
- CABG following heart attack

Supply sensitive services: *often avoidable care*
- Total Inpatient Days
- Inpatient Days in ICU or CCU
- Evaluation and Management (visits)
- Imaging
- Diagnostic Tests

Lower in High Spending Regions

Higher in High Spending Regions
Currently, chronic care system is designed to optimize # of episodic discrete MD-visits (with 45% guideline defect rate).

Will speeding this process improve it?

Classic mistake of automating to fix a broken system.

Turbocharging & speeding on a really bad chassis.
• Re-define to team-based, proactive continuous care model with performance incentives

• Automate this model after new processes in place

• Re-define CC delivery → *enabled* by information technology but not *driven* by it.

• Finally, re-engineer new system to optimize cost, quality, time
Value Proposition for Patients

• First understand outcome values, then optimize them
  – Big tickets, doctor probably knows best
  – But we don’t understand subtler shades of “utility”

• Tools to optimize & manage the cost / value trade-offs
American Health Information Community

- Paper Kills: Bush 10 - year plan
- ONCHIT & birth of AHIC
- Federally chartered advisory committee
- Need for “breakthrough projects”
  - Electronic Health Records (lab data)
  - Chronic Care (messaging)
  - Consumer Empowerment (PHR & Rx data)
  - Biosurveillance (flow of de-identified data to gov’t)
Chronic Care Work Group

- Advisory body to the Community (AHIC), ONCHIT, Sec’y HHS, and all other constituents
- Breakthroughs in adoption of secure messaging & remote monitoring
- Hears testimony from vendors, gov’t agencies, academics, specialty societies & industry consortia
Chronic Care Workgroup Charges

• **Broad Charge for the Workgroup:**
  – Make recommendations to the Community to deploy widely available, secure technology solutions for remote monitoring and assessment of patients and for communication between clinicians about patients.

• **Specific Charge for the Workgroup:**
  – Make recommendations to the Community so that within one year, widespread use of secure messaging, as appropriate, is fostered as a means of communication between clinicians and patients about care delivery.
Unstructured (Text) Secure Email

• Good place to start, baby steps
• Patient ↔ MD channel only, for now
• Technology already available
• Many providers using it
• Aim at widespread adoption within 1 year
• Analyse barriers
Key Issues in Committee Report

1. Reimbursement

2. Medical Liability and Licensure

3. Standards for Secure Patient-Clinician Messaging and Supporting Systems
   - S/MIME for secure email

4. Consumer and Clinician Access

5. Privacy and Security
RECOMMENDATION 1.0:

HHS should develop and regularly update the evidence base for informed reimbursement policies with respect to secure messaging between clinicians and their patients. This should include monitoring and reporting the effect of secure messaging on cost, quality of care, patient and caregiver satisfaction, and medico-legal issues.
Reimbursement Controversy

• **Payers:**
  – Pilots show new workflow causes MD practice disruption, patients don’t trust it. Increases costs. Not ready for prime time?

• **CMS:**
  – New payments need to ↓ costs & ↑ quality; need to study cost / quality effects of many pilots;
  – Not ready to open up new CPT Code for payment
  – Don’t expect reform in one year

• **Office of Inspector General:**
  – New opportunity for inappropriate billing practices
AHIC Pilot Projects

- Current state of CC Workgroup: federal policy can promote adoption, but no appetite for increased costs
- Call for research to study chronic care HIT with most bang for buck
  - Then, Federal promotion levers
- Dovetails with reimbursement reform concepts
  - P4IT and other accountability / incentives
Intensive Outpatient Pilot (IOP)

• Sponsored by large employer
• Ambulatory ICU theory
• Process reengineering for lower costs / higher quality
  – But firm cost expectations
• Sickest ambulatory 10%
Intensive Outpatient Pilot (IOP)

- Three Seattle-area clinics
  - The Everett Clinic, Virginia Mason, Valley Medical Center
- Case rate + fee-for-service
- High touch / high comm
- Reduced MD visits, ER, Hosps expected
IOP Communication Technology

- Patients -- phone & ordinary email
- Specialists -- cell phone channel
- Clinic-clinic -- Sharepoint blogs, best practice sharing & clinic-pilot problem resolution
- Clinic-payer – fax notification of events (hospitalizations)
IOP Back Office Technology

- Care plans
- Registries
- Guideline management
- Performance measure upload
- Rx & claim data download
- ETG efficiency ratings of specialists
- Surveys online: surveymonkey
IOP Remote Monitoring

- Fancy gadgets too expensive
- Frequent: weights, BP, peak flow, blood sugar
- Episodic: HbA1C, LDL
- Non-MD clinic visits & home / neighborhood visits
Conclusion

• Huge opportunity in Chronic Care

• Technology necessary but not sufficient
  – Ditto standards, interoperability, etc etc

• It’s about business processes in a messy service industry
Conclusion

- Start with accountable business units
- Measure all variables / document processes
- Add a pinch of Toyota lean
- Introduce technology slowly
- Insist on proof of cost savings for fancy gadgets