MOVING FROM HEALTH CARE TO HEALTH

ECRI Conference
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November 6th 2014
Example 1: Learning Networks

Closing the Loop: Using networks To Link Research and Application at Scale

Peter Margolis, Michael Seid, Keith Marsolo, Dick Colletti, ICN network
Learning Healthcare System

**Components of a network-based Learning Health System * **

1. Focus on outcome
2. Build community
3. Effective use of technology
4. Learning system
   - System science, QI, qualitative research, clinical research (ALL RESEARCH)

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*Collective creativity (Swarm Creativity; Peter Gloor)
Lead User innovation (Democratizing Innovation; Eric von Hippel)
New economic models (The Wealth of Networks; Yochai Benkler)
Improving Outcomes with a Learning Health System

- Patients and Families
- Clinicians
- EHRs
- Patient-Reported Data
- Biospecimens

Point of Care Learning Engine

Standardize Care Process
Reduce Variability in Care
Customize Care to Patient Needs

Patient Outcomes

Registry Database
Effective use of technology to reduce costs of data collection

John Hutton, MD; Keith Marsolo, PhD; Charles Bailey, MD; Christopher Forrest, MD, PhD; Marshall Joffe, MD, PhD; Wallace Crandall, MD; Mike Kappleman, MD, MPH; Eileen King, PhD
Improving Outcomes with a Learning Health System

- Patients and Families
- Clinicians

Point of Care
Learning Engine

Standardize Care Process
Reduce Variability in Care
Customize Care to Patient Needs

- EHRs
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- Biospecimens

Registry Database
Registry Applications

Patient Outcomes
Improving Outcomes with a Learning Health System

- Patients and Families
- Clinicians
- Identify Uncertain Management Practices
- Multi-stakeholder Informed Research
- Comparative Effectiveness Research
- EHRs Patient-Reported Data Biospecimens
- Registry Database
- Registry Applications

Point of Care
- Learning Engine
- Identify Gaps in Care
- Standardize Care Process
- Reduce Variability in Care
- Customize Care to Patient Needs
- Patient Outcomes

New Knowledge
Remission rate
(PGA, Centers >75% registered)

- 63 Care Centers
- >17,500 patients
- >500 physicians
- >35% of all IBD patients

2007 2008 2009 2010 2011 2012 2013

77%
Social Network Analysis

Example High-Remission Hospital with Clustered QI Discussion

Example Lower-Remission Hospital with Scattered QI Discussion

Ron Burt, PhD, David Meltzer, MD, PhD, Gavin Hougham, PhD
# Re-design Care - Care Center Level Studies

<table>
<thead>
<tr>
<th>Treatment Combination</th>
<th>Pre-visit Planning</th>
<th>Population Management</th>
<th>Self-Management Support</th>
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<tbody>
<tr>
<td>Site 1</td>
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% in Remission

Run Order Plot

RR: % in Remission

Sites 1, 3, 6, and 7 show significant differences in remission rates compared to other sites.
Total Projected Savings by 2015:

- From 2007 to 2011, the proportion of ImproveCareNow C3N patients in sustained remission increased 11-14%.

- Project cost reductions for current centers of 3%, 5% and 7% in years 1, 2 and 3. We conservatively project cost reductions for expansion centers of 0%, 2% and 4% in years 1, 2 and 3.

- *Cost reductions increase each year; the cumulative savings is $55,785,600 after 3 years.*
Example 2: Community Based Learning System

Mona Mansour, Rob Kahn, Andy Beck
Missed days of day care or school

(n=774)

Does not attend/work

- 0: 19.5%
- 1 to 3: 25.1%
- 4 to 6: 23.5%
- 7 to 10: 12.4%
- 11 to 15: 8.9%
- 16 to 30: 3.1%
- 30+: 4.8%
- 30+: 2.7%
Asthma admission rate in Hamilton County, by n’hood
(Per 1000 children, avg over 2010-2012)

CCHMC has 90+% of all asthma admissions in county

**Quintile 1:**
- 18 admits among 29,000 kids
- 0.6 per 1000
- 17% of pop’n with 2% of admissions

**Quintile 5:**
- 299 admits among 17,900 kids
- 16.7 per 1000
- 11% of pop’n with 35% of admissions
Readmission and race

- Difficulty making ends meet
- Looking for work but being unable to find
- Financial difficult with rent or utilities
- Had to move in with others
- No home/car ownership

Percent not yet readmitted

Days from index admission

Beck

365 Days

White

African American

0 100 200 300 400 500 600 700 800
Children from RED neighborhood:
- 5x more likely to lack reliable transportation
- 5x more likely to live in poverty
- 7x more likely to have a depressed parent
- 8x more likely to be exposed to cockroaches
- 2.5x more likely to have cracks/holes in wall
The Story of Darryl

The Triple Aim

- Improve individual experience
- Improve population health
- For the whole population
- At the lowest cost
- Control inflation of per capita costs
Who Am I?

- 9 year old with severe persistent asthma
  - My first admission was when I was age 7
  - I have had 4-8 ED visits/year, but no ICU admits yet
  - My dad and younger sister have asthma
  - My medications are Symbicort, Qvar, Singulair, Flonase, and Albuterol
    - I take them sometimes
  - My triggers are activity, changes in weather, tobacco smoke, animals, and dust
  - I am getting admitted today

What’s going on with me?

- I live with my mom and siblings; I just relocated AGAIN due to apartment fire and my mom’s boyfriend did not move with us due to domestic violence
- I spend weekends with my dad and his girlfriend, but my aunt and grandma also care for me
- I have difficulty getting some of my medications due to insurance denial
- My new apartment is very old, dusty and might have mildew in the basement
- My sister has bi-polar disorder and my mom has to spend a lot of time caring for her
- I am 9 and I forget to take my medications or can’t take them sometimes if I’ve left them at another caretaker’s home
Asthma System Level

Key Driver Diagram for FY 14

James M. Anderson Center for Health Systems Excellence

Outcomes

Strategic Goal

Strategic Operating Plan
2015 Goal

Reduce the number of asthma related ED visits and admissions by 20% for Hamilton County children ages 2-17 by 6/30/15.

Outcomes-Key Drivers

(High prioritized processes/system elements)

Reliable Preventative Services

Effective management/co-management of active CCHMC patients during/after asthma related visits to CCHMC or other regional hospitals

Effective patient and family engagement in self-management

Effective, continuous and appropriate use of prescribed medications by patient

Mitigation of socioeconomic/psychosocial barriers to optimal asthma care

Effective partnerships with community agencies (i.e., schools/school based health centers, CHD, safety net providers, pharmacies)

Reliable contact and communication with patient and family

Reliable Access to Medication in the Patient’s Home

Community Engagement and Awareness about Asthma

Project Portfolio

Increase the percent of CCHMC Medicaid Primary Care patients (PPC, Hopple, and Fairfield) 2-17 years of age whose asthma is rated well controlled by a score ≥ 20 on the Asthma Control Test (ACT) from 45% to 60% by June 30, 2014.

Increase the number of schools from 2 to 8 in which a *majority of students who have poorly controlled asthma are connected to a medical home within 1 month* by June 30, 2014.

Increase the percent of asthmatics across all CPS elementary schools with a documented ACT score from 44% to 60% by June 30, 2014.

Decrease the failure rate (failures/1000 days enrolled) from 3.7 to 3.3 by June 30, 2014.

Decrease the percent of Asthma Admissions that had Readmission or ED visit within 30 days: Hamilton Co. Medicaid patients age 2-17 from X% to 5% by June 30, 2014.

Decrease the percent of Asthma Admissions that had Readmission or ED visit within 90 days: Hamilton Co. Medicaid patients age 2-17 from 23% to 15% by June 30, 2014.

Project Leader

Mona Mansour/Carolyn Kercsmar

Mona Mansour/Carolyn Kercsmar

Mona Mansour/Carolyn Kercsmar

Lisa Crosby/Brandy Wiener

Carolyn Kercsmar/Jeff Simmons

Carolyn Kercsmar/Jeff Simmons

* Majority = 50% or greater # students who have poorly controlled asthma; connected to a medical home = appointment with PCP for asthma completed within one month of low ACT score; poorly controlled asthma = ACT score below 20

Key
Dotted box = Placeholder for future additions
Green shaded = what we’re working on right now

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Intervention Phases and Outcomes

– **Phase 1, Hospital Focus:** ~July 2008-December 2009 (pre-EPIC)
  – Measure: Readmissions and/or ED revisits within 30-days of discharge
  – Key intervention: Medications in-hand at discharge

– **Phase 2, Home Focus:** ~January 2010-June 2011 (EPIC “infancy”)
  – Measure: Readmissions and/or ED revisits within 90-days of discharge
  – Key interventions:
    - Systematic risk assessment with standardized tools
    - Home health pathway
    - CLEAR
    - **Care coordination**

• **Phase 3, Community Focus:** ~July 2011-present (EPIC “teen” years)
  – Measure: 90 day and overall utilization measures, targeting “hot spots”
  – Key interventions: geographic data, community partnerships
Asthma admissions 9/1/10-8/31/11

- Legal Aid housing cases
- City of Cincinnati

Admission rate per 1000
- 0.00 - 0.78
- 0.79 - 3.40
- 3.41 - 5.76
- 5.77 - 10.99
- 11.00 - 27.24
- Census tract

Legal Aid Housing Cases Mapped Against Neighborhood Asthma Hotspots
Cincinnati Asthma Admissions and Neighborhood Asthma Hotspots

Asthma admissions 9/1/10-8/31/11

- Schools
- Asthma admissions
- City of Cincinnati

Admission rate per 1000
- 0.00 - 0.78
- 0.79 - 3.40
- 3.41 - 5.76
- 5.77 - 10.99
- 11.00 - 27.24
- Census tract

[Map showing asthma hotspots]
Rolling 12 Month Average Number of ED Visits per 10,000 Hamilton Co. Medicaid Patients age 2 through 17 years old.


ED Visits that result in an admission are not included.

FY13 Q4 16.9

Last update: 11-27-13 by H. Atherton  Data source: Epic
National model for integration of research with health care delivery

Improving Child Health

Health care delivery

Outcomes Research

Clinical Trials

Translational Research

Basic research

John Bucuvalas, MD

Schematic of Outcomes

Outcomes

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%

Research

Best Practice

QI

Current outcome