Moving from volume to value: Re-imagining pediatric asthma care in Maricopa County

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What are the problems with U.S. health care delivery?

- The same U.S. health care delivery system produces some of the world’s best health outcomes – and some of the worst.
- Access to medical care is unequal and inconsistent.
- We spend a lot on health care delivery but higher spending does not necessarily lead to better health outcomes.
- U.S. health care delivery spending trends are unsustainable.
**Access (insurance)**

Percent of population without health insurance (U.S. 2012; States 2011-2012)

<table>
<thead>
<tr>
<th>State</th>
<th>Percentage Without Health Insurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>15%</td>
</tr>
<tr>
<td>Canada</td>
<td>0%</td>
</tr>
<tr>
<td>U.K.</td>
<td>0%</td>
</tr>
</tbody>
</table>

Best state = MA with 4% uninsured
Worst state = TX with 24% uninsured


**U.S. spends significantly more on health care per capita than other countries**

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Health Expenditures per Capita (2011)*</th>
</tr>
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<tbody>
<tr>
<td>U.S.</td>
<td>$10,000</td>
</tr>
<tr>
<td>Canada</td>
<td>$4,000</td>
</tr>
<tr>
<td>France</td>
<td>$6,000</td>
</tr>
<tr>
<td>UK</td>
<td>$8,000</td>
</tr>
</tbody>
</table>

*Cost data is an average for each medical center. Established by determining the average charge within that medical center for CABG procedures in relation to the medical centers gross patient income to net patient income ratio.


**Higher healthcare spending does not correlate with better outcomes**

Risk adjusted mortality and cost for Coronary Artery Bypass Grafts within California hospitals completing 150+ cases per year (2012)

- Better outcomes do not necessarily correlate with higher healthcare spending.
- Higher spending does not always lead to better patient outcomes.


**Entitlement spending + interest payments may exceed U.S. total revenue by 2025E!**

Entitlement spending + interest payments vs. revenue as % of GDP (1980-2050E)

- Entitlement spending + interest payments exceed revenue as % of GDP by 2025E.
- The graph shows that entitlement spending + interest payments are projected to outpace revenue by 2025E.

Source: Congressional Budget Office (CBO) Long-Term Budget Outlook (6/10). Note that entitlement spending includes federal government expenditures on Social Security, Medicare and Medicaid. Data in our chart is based on CBO's 'alternative fiscal scenario' forecast, which assumes a continuation of today's underlying fiscal policy. An alternative fiscal scenario, also known as a 'baseline' or 'neutral' scenario, is closely aligned with current law and assumes a wide range of economic and policy assumptions. Data in this chart are based on CBO's 'alternative fiscal scenario' forecast, which assumes a continuation of today's underlying fiscal policy and includes assumptions about the economy and tax and spending policies. Note that CBO also maintains a 'baseline' scenario, which adheres closely to current law. The alternative fiscal scenario deviates from CBO's baseline because it incorporates some policy changes that are widely expected to occur (such as extending the 2001-2003 tax cuts rather than letting them expire as scheduled by current law and adjusting physician payment rates to be in line with the Medicare economic index rather than at lower scheduled rates) and that policymakers have regularly made to the past. Source: Meeker, Mary. 2011. USA Inc.: A Basic Summary of America's Financial Statements. KPCB.
Where do we want to be?

Highest value health care delivery

\[
\text{Value} = \frac{\text{Quality}}{\text{Total Cost}}
\]

Where do we start?

Population

- At risk for illness/chronic conditions
- Chronic conditions
- Tertiary prevention
- Quaternary prevention
- Acute illness

- To remain financially neutral/self-sustaining, start at the "bottom" of the graph, i.e., with your sickest and most expensive patients
- Gradually move up through the rest of the segments and you will eventually address the needs of the full population

How do we make it happen?

- New models of care that deliver the highest value to patients
- New payment models to support these care models and reward providers for value rather than volume

Agenda

- What do we want from our health care system?
- Why pediatric asthma?
- Addressing the problem
- Next steps
Introduction to asthma

- Chronic disease of the lungs
- Affects adults and children of all ages
- Characterized by repeated episodes of wheezing, breathlessness, chest tightness, and nighttime or early morning coughing
- In most cases, exact causes of asthma are unknown and there is no cure
- Most people with asthma can control their symptoms by:
  - avoiding things that trigger an asthma attack and
  - receiving appropriate medical care
- Without proper management, asthma can result in frequent emergency department (ED) visits, hospitalizations, and premature deaths.

Source: [http://www.cdc.gov/asthma/info.html](http://www.cdc.gov/asthma/info.html)

National asthma burden

- 25.7 million people, including 7.0 million children under 18
- Significant health and economic burden to patients, their families, and society:
  - In 2007, the estimated total cost of asthma was $56 billion*
  - In 2008, children aged 5–17 years who had one or more asthma attacks in the previous 12 months missed 10.5 million days of school. Adults who were employed and had one or more asthma attacks during the previous 12 months missed 14.2 million days of work.
  - In 2010, 1.8 million people visited an ED for asthma-related care and 439,000 people were hospitalized because of asthma

*2009 dollars, includes medical expenses, loss of productivity, and premature death.

Source: [http://www.cdc.gov/asthma/info.html](http://www.cdc.gov/asthma/info.html)

Asthma prevalence varies by geography

Adult self-reported asthma prevalence by state or territory (2010)

As well as age group: Children are more likely than adults to have asthma

Current Asthma Prevalence by Age Group (average annual 2008-2010)

- In Arizona, 21% of youth and 15% of adults have asthma
- In 2008, asthma was the 6th leading cause of death among children in Arizona

Children are also more likely to experience an asthma attack

Asthma Attack Prevalence by Age Group (2001-2010)

Percent

<table>
<thead>
<tr>
<th>Year</th>
<th>Children aged 0-17 years</th>
<th>Adults aged 18 and over</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>2002</td>
<td>58%</td>
<td>48%</td>
</tr>
<tr>
<td>2003</td>
<td>56%</td>
<td>46%</td>
</tr>
<tr>
<td>2004</td>
<td>54%</td>
<td>44%</td>
</tr>
<tr>
<td>2005</td>
<td>52%</td>
<td>42%</td>
</tr>
<tr>
<td>2006</td>
<td>50%</td>
<td>40%</td>
</tr>
<tr>
<td>2007</td>
<td>48%</td>
<td>38%</td>
</tr>
<tr>
<td>2008</td>
<td>46%</td>
<td>36%</td>
</tr>
<tr>
<td>2009</td>
<td>44%</td>
<td>34%</td>
</tr>
<tr>
<td>2010</td>
<td>42%</td>
<td>32%</td>
</tr>
</tbody>
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Source: http://www.cdc.gov/asthma/info.html

Agenda

- What do we want from our health care system?
- Why pediatric asthma?
- Addressing the problem
- Next steps

Key steps to achieving high-value care

1. Set a clear goal, aka develop a shared vision
2. Identify and characterize your target population
3. Define specific outcome metrics and evaluations
4. Define intervention(s)
5. Develop a business case
6. Implement pilot program
7. Carry out post-implementation review (PIR)
8. Adjust model based on PIR
9. Become a learning health care system
10. Scale
1) Develop a shared vision: Some guiding principles

- Make sure the right people are in the room
- Think about the big picture
- Make sure everyone is on the same page when it comes to key terms/definitions
- Test validity of assumptions and constraints
- Be creative and innovative
- Build on ideas of others

Key components of a strong vision

- **Destination**, i.e., Where are we going? What does success look like?
- **Purpose**, i.e., Why are we here? What are we trying to accomplish?
- **Values**, i.e., What are our guiding principles?

2) Identify and characterize target patient population

- Define a set of criteria for selection of target population, e.g.,
  - Specific geographic area
  - High cost patients
  - High cost conditions
  - Age groups
  - Availability of best practices
  - Other – TBD
- Identify key data types, data sources, and potential data gaps

Identify and characterize target patient population cont’d

- Collect data
- Establish baseline for target population, e.g.,
  - Geo-mapping
  - Conditions
  - Costs
  - Utilization
  - Referral flow patterns
  - Socioeconomic and behavioral characteristics
Maricopa county asthma admissions

Total admissions* 4,191
Admissions through the ED 3,251
% ED admissions (as % total) 78%

Payer mix**
- Medicaid 64%
- Commercial 26%
- Uninsured 4%
- Other 6%

*2011 data. DRGs: 202 and 203. Patients age 20 and under only.
**Commercial = HMO, PPO, Commercial(indemnity); Uninsured = Self pay, Charity; Other = Other, Champions/TRICARE, Indian Health Service, Healthcare Group, Children’s Rehab, Foreign National.

Source: Arizona Hospital Discharge Data Set, Bureau of Public Health Statistics, Arizona Department of Health Services, 2011.

Where are the patients coming from?

Note: 2011 data. DRGs: 202 and 203. Patients age 20 and under only.
Source: Arizona Hospital Discharge Data Set, Bureau of Public Health Statistics, Arizona Department of Health Services, 2011.

Nearly 60% of asthma admissions are children age 1 and under

Note: 2011 data. DRGs: 202 and 203. Patients age 20 and under only.
Source: Arizona Hospital Discharge Data Set, Bureau of Public Health Statistics, Arizona Department of Health Services, 2011.
3) Define key outcome metrics and evaluation approach

- Define key metrics, e.g.,
  - Clinical outcomes
  - Utilization (admissions, ER visits, LOS)
  - Costs
  - Patient satisfaction
  - Patient functional status
  - Other – TBD

- Define evaluation scheme
  - Timeline
  - Data collection frequency
  - Analyses

Example metrics we plan to use

- Utilization
  - Admissions
  - Length of stay
  - ER visits
  - Clinic visits
- Total cost of care
- Missed school days
- Asthma severity

Some guiding principles about data and metrics

- Be clear about the issue at hand
  - Not everything that can be measured is useful or relevant
  - Measure what matters
- Avoid analysis paralysis
  - You will never have perfect data
  - Not everything that may be useful/relevant is possible to measure
  - If addition of data will not change your answer, forget about it
4) Define intervention(s)

- Carry out root cause analysis
- Identify providers and practices that currently have the best outcomes and learn from them – if they are local, even better!
- Design a set of potential solutions to address the problem(s) identified via root cause analysis and leveraging best practices

Before finding solutions to your problem, you need to know its root causes

- "The residents of village Downstream had built their community beside a river. Many years ago, they began to notice that growing numbers of drowning people were caught in the river’s swift current.
- So they invented ever more elaborate technologies to save them. Talk to them today, and they’ll speak proudly about the hospital by the edge of the water, the rescue boats at the ready, and the many dedicated lifeguards ready to risk their lives.
- So preoccupied were these heroic villagers with rescue and treatment that they never thought to look upstream to find out why people were falling in the river in the first place."

DMG facilities span many asthma “hotspots”

Maricopa County asthma admissions by patient origin (2011)

Note: 2011 data. DRG 202 and 203. Patients age 20 and under only.
Source: Arizona Hospital Discharge Data Set, Bureau of Public Health Statistics, Arizona Department of Health Services, 2011.
ED visits for asthma tend to spike toward the end of the day
Maricopa County asthma ED visits by time of day (2011)

How are we going to define intervention?

- Reviewing examples of successful asthma interventions nationally
- Examining existing asthma care pathways in local partner facilities (e.g., do they exist, are the providers following them, what are the outcomes)
- Doing further characterization of our patient population, e.g.,
  - Interviews with providers
  - AHCCCS claims data
  - Patient/ caregiver interviews

Integrated Care Collaboration asthma program: Overview

- Key providers
  - Registered respiratory therapist/ educator
- Patients are identified via two pathways
  - Query of regional HIE (Care) to identify patients who have one of the following
    - At least 1 ED visit for asthma in last 12 months
    - At least 1 IP visit or hospitalization for asthma in last 12 months
    - >4 OP visits for asthma in last 12 months
  - Direct physician referral
- Program consists of home visits by respiratory therapist/ educator during which patient and/ or family receive tailored asthma education, e.g., self-management and monitoring techniques, medication management, peak flow meter and diary training, etc.
- An asthma action plan, completed during each session, is placed in the patient’s medical record, a copy is given to the patient or parent, and for school-age children the plan is faxed directly to school nurse and the child’s provider.
- Program also provides primary care placement, Rx assistance, funding eligibility screening, quarterly phone follow up.

Integrated Care Collaboration asthma program: Selected results

<table>
<thead>
<tr>
<th>Measure</th>
<th>Change</th>
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<tr>
<td>ED visits</td>
<td>37%</td>
</tr>
<tr>
<td>Admissions</td>
<td>63%</td>
</tr>
<tr>
<td>IP days</td>
<td>46%</td>
</tr>
<tr>
<td>Clinic visits</td>
<td>10%</td>
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Quality of life measures (n=153)

- Use peak flow meter: 35%
- Had school absences: 27%
- Asthma severity assessment (n=153)

Financial outcomes (n=229)

- Program operating expenses: $141K
- Program annual savings: $645K
- Per patient savings: $32.04

Source: http://www.icc-centex.org/
So, it can be done, but you must develop tailored interventions

- Learn from other organizations BUT
  - “Best practices” will only take you so far
  - A successful reform in one country/state/city/organization may not be successful in another
- Context is key (social, political, regulatory, etc.)
- If an intervention, no matter how flawlessly implemented, does not lead to better outcomes...you need to re-examine the intervention

5) Develop a business case

- Define resource needs to implement intervention
  - Space and equipment
  - Personnel
  - Other
- Identify potential cost savings or revenue upside from intervention
- Develop payment mechanism to ensure that intervention is self-sustaining
- Review and address regulatory requirements

Access to data and risk readiness can be used to identify appropriate provider payment schemes

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<th>SS</th>
<th>BP</th>
<th>MC</th>
<th>FC</th>
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Next steps

- Better characterization of patient population
- Analysis of further branches of RCA tree
- Finalizing the pilot intervention
- Building a business case
- Approaching payers to see if they would support a pilot

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