Asthma Population Management: Identifying Persistent Asthma, Defining High Risk Asthma, and Measuring Quality of Asthma Care

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Constructs to be Measured

• Severity (Persistent Asthma)
• Control
  – Impairment
  – Exacerbations
• Quality of Care
Types of Administrative Data Used

• Encounter diagnosis of asthma
  – Hospital
  – Emergency Department
  – Outpatient

• Pharmacy data
  – Short-acting beta agonist canisters
  – Oral corticosteroid dispensings
  – Controller units and percent of days covered
Outline of Presentation

• Assessment of Severity
  – Persistent asthma (HEDIS)

• Assessment of Impairment
  – Short-acting $\beta$-agonist canister dispensings

• Assessment of Risk (Exacerbations)
  – Prior exacerbations
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• Assessment of Quality Care (HEDIS)
  – Any controller measure
  – Medication ratio measure
  – Adherence measure
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Question

Which of the following is true regarding the HEDIS definition for persistent asthma?

- A. It appears to have low specificity for persistent asthma based on patient-reported information
- B. It includes pulmonary function measures, which increases its specificity
- C. A two year definition increases its specificity
- D. It does not include exacerbations
HEDIS Persistent Asthma

• HEDIS definition of persistent asthma
  – > 4 or more asthma medication dispensing events
  – > 1 ED visit with asthma as the principal diagnosis
  – > 1 hospital admission with asthma as the principal diagnosis
  – 4 ambulatory visits with asthma and > 2 asthma medication dispensing events

• One or two year
Relationship of HEDIS Persistent Asthma to Survey Persistent Asthma

- 2,895 HEDIS patients in 2006 completed survey in fall 2007
- Survey-defined persistent asthma
  - Daytime and nighttime symptoms
  - Rescue therapy
  - Activity limitation
  - Regular controller therapy
  - Exacerbations (> 1 requiring oral CS in past 12 months)

Relationship of HEDIS to Survey Persistent Asthma (PA)

• 86.9 % of patients reported survey PA
• Follow-up survey 5 month later
  – 95 % with 1\textsuperscript{st} survey PA had PA on 2\textsuperscript{nd} survey
  – 54 % of those without 1\textsuperscript{st} survey PA had PA on 2\textsuperscript{nd} survey
• HEDIS requalification in 2007
  – 68 % of patients with survey PA versus 22 % without survey PA
## HEDIS Requalification and Subsequent Utilization

<table>
<thead>
<tr>
<th>2008 utilization</th>
<th>2007 HEDIS requalification</th>
<th>P Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes (N=1,712)</td>
<td>No (N=805)</td>
</tr>
<tr>
<td>Hospitalization or ED visit</td>
<td>6.1 %</td>
<td>2.7 %</td>
</tr>
<tr>
<td>Any oral corticosteroid</td>
<td>37.6 %</td>
<td>28.0 %</td>
</tr>
<tr>
<td>Two or more oral corticosteroids</td>
<td>17.4 %</td>
<td>10.9 %</td>
</tr>
<tr>
<td>SABA &gt; 6</td>
<td>25.4 %</td>
<td>8.9 %</td>
</tr>
</tbody>
</table>
Persistent Asthma: Conclusions

- HEDIS persistent asthma is generally consistent with survey-defined persistent asthma
- The two year HEDIS population is even more specific for persistent asthma and associated with increased utilization
- The two year HEDIS population is a “valid” population for outreach and quality of care assessment
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Beta Agonist Long Term Control Scale

- Beta agonist canister dispensings per year
  - 0-2
  - 3-6
  - 7-12
  - > 12

- Two samples
  - Random sample of adult 2250 KP patients (aged 18-56) with persistent asthma (1999) who completed survey in 2000
  - 62,369 members of Southern California KP asthma database in 2002 and 2003

Relationship of Beta Agonist Scale to Patient-Reported Outcomes

All $p < 0.0001$
Question

Which of the following have been shown to predict an increased risk for asthma exacerbations in children and adults

A. Dispensing > 6 short-acting beta agonist canisters in a 12 month period
B. Dispensing ≥ 3 short-acting beta agonist canisters in a 12 month period
C. Prior oral corticosteroid dispensing for asthma
D. All of the above
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Relationship of Beta Agonist Scale to Utilization Outcomes

All $p < 0.001$
Risk of More Than 6 Short-Acting Beta-agonist Canisters Per Year

- 93,604 patients aged 6-56
- 70 US Health Plans
- Risk in following year
- Odds Ratios (95 % Confidence Intervals)
  - ED/Urgent Care: 6.47 (5.25-7.98)
  - Hospitalization: 5.37 (6.04-9.76)
  - Oral corticosteroid: 2.89 (2.72-3.08)

Short-acting Beta-agonist (SABA) Dispensings and Exacerbations

• Commercial and Medicaid Databases
• Children aged 4-17 years
  – Commercial: 41,753
  – Medicaid: 25,048
• Adults aged ≥ 18 years
  – Commercial: 59,684
  – Medicaid: 8,745
• Assessment of SABA in 12 month period
• Exacerbation outcomes

## Prediction of Asthma Exacerbations

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Critical SABA use</th>
<th>Exacerbation Odds Ratios (95% Confidence Interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Hospital/ED Visit</td>
</tr>
<tr>
<td>Medicaid Children</td>
<td>≥ 3 in 12 months</td>
<td>1.80 (1.60-2.02)</td>
</tr>
<tr>
<td>Commercial Children</td>
<td>≥ 3 in 12 months</td>
<td>2.23 (1.94-2.56)</td>
</tr>
<tr>
<td>Medicaid Adults</td>
<td>≥ 2 in 3 months</td>
<td>1.84 (1.57-2.15)</td>
</tr>
<tr>
<td>Commercial Adults</td>
<td>≥ 2 in 6 months</td>
<td>2.21 (1.98-2.47)</td>
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Question

- Which of the following HEDIS measures have been shown to be related to improved asthma outcomes, including patient-reported outcomes
  - A. Asthma medication ratio measure
  - B. Asthma adherence measure
  - C. Any controller measure
  - D. None of the above
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HEDIS Any Controller Numerator

Any Asthma Controller Dispensing

• The following medications are considered valid controller medications:
  – Inhaled corticosteroids
  – Inhaled cromolyn and nedocromil
  – Oral leukotriene modifier and theophylline medications
  – Excludes long-acting beta agonists
Any Controller Use Is Associated With Increased Risk in HEDIS Patients

- 49,637 patients with HEDIS-defined persistent asthma in 1999
- 3 health plans in 3 regions
- Controller use in year 2000
- Outcome: Asthma-related ED visit or hospitalization (ED/Hosp) in 6 months following first medication

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Asthma Medication Ratio

- Controllers/(Controllers + Short-acting Beta Agonists)
- Number of canisters or canister equivalents (30 day supplies of oral controllers)
- Ranges from 0 (no Controllers) to 1.0 (no Short-acting Beta Agonists)
- \( \geq 0.5 \) appears to be the optimal cut-off (in relationship to improved outcomes)
Relationship of Medication Ratio to Acute Episodes

- 38,433 Southern California Kaiser Permanente patients with persistent asthma
- Medication ratio determined in 2002
- Acute episodes (one or more asthma emergency department visits or hospitalizations) determined in 2003

Relationship of Medication Ratio to Acute Episodes

P < 0.0001
Relation of Medication Ratio to Patient-Reported Outcomes

• Random sample of 2250 adult patients (aged 18-56) with persistent asthma (1999)
• Northern California, Southern California, and Northwest Kaiser Permanente
• Survey completed in Fall, 2000
• Survey included quality of life (AQLQ), control (ATAQ) and symptom severity (AOMS)
• Medication ratio from year 2000 computerized pharmacy records

Schatz, et al. Chest 2006; 130:43
Relationship of Ratio $\geq 0.5$ to Poor Symptom Control

All $p < 0.0001$
Medicaid Population

• 90,909 Medicaid patients aged 5-56 with persistent asthma in California and New York

• *Reduction* of risk of exacerbation in follow-up year in patients with ratio \( \geq 0.5 \)
  – Aged 5-56
  – Aged 5-19
  – Aged 20-40
  – Aged 41-56

• *Increased* risk of exacerbations with HEDIS any controller measure in all age groups

Predictors of High Medication Ratio

- Higher controller medication possession ratio (adherence)
- Lower SABA dispensings
- Specialty care
- Combination ICS-LABA therapy
- Leukotriene receptor antagonist controller

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New HEDIS Adherence Measure

- HEDIS two year persistent asthma denominator
- Two Rates
  - The percentage of members who remained on an asthma controller medication for at least 50% of their treatment period
  - The percentage of members who remained on an asthma controller medication for at least 75% of their treatment period
New HEDIS Adherence Measure: Concerns

• Measuring adherence to *inhaled* medications from pharmacy data is methodologically challenging
  – Variable accuracy of days supply field
  – Varying MD directions and patient use
  – Varying number of puffs per canister

• Relationship of this measure to *actual* medication adherence is uncertain

• Relationship of this measure to improved *outcomes* has not been tested
HEDIS Administrative Data Asthma Quality Measures: Conclusions

• The any controller measure is not related to improved asthma outcomes
• The medication ratio measure is related to improved asthma outcomes (impairment and risk) within health plans
• The relationship of the new adherence measure to asthma outcomes is unknown
Conclusion: Potential Patients for Intervention

- Persistent asthma and no controllers
- Patients with prior exacerbations
- Excess short-acting beta agonist canister dispensings
  - > 6 in 12 months
  - Consider ≥ 3 in 12 months in children
  - Consider ≥ 2 in 6 months in adults
- Medication ratio < 0.5 in patients with persistent asthma