GLIDES Asthma CDS At Yale Specialty Clinic

Review of Evaluation Results
Agenda

• Background
• Evaluation Approach
• Quantitative Evaluation Results
  – Asthma Control
  – Asthma Severity
  – Treatment Steps
• Qualitative Evaluation Results
  – Key Findings
  – Opportunities For Improvement
• Next Steps
Background

• Clinical decision support (CDS) tool for pediatric asthma
  – Based on National Asthma Education Program Expert Panel Report 3 (EPR-3)
  – Developed and implemented in the pediatric pulmonology clinic affiliated with Yale University
  – Created to be visually similar to the figures contained in EPR-3
  – Implemented in the clinic in January 2009
Evaluation Summary

• Over the last several months, we have evaluated clinician’s experience and feedback

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Who</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment of pulmonologist’s decisions alignment with CDS decision</td>
<td>Laura Hoeksema, Leora Horwitz</td>
<td>Quantitative: Review of charts and</td>
</tr>
<tr>
<td>recommendations</td>
<td></td>
<td>Centricity data</td>
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<tr>
<td>Assessment of pulmonologist’s experience of using CDS, with a focus on</td>
<td>Ed Lomotan, Leora Horwitz,</td>
<td>Qualitative: Direct observation and</td>
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<tr>
<td>sub-specialty themes</td>
<td>Diana Edmonds</td>
<td>user interviews</td>
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• This presentation summarizes the results of the evaluation work, and recommendations opportunities for the future
Quantitative Evaluation

• We compiled CDS utilization data from January 5, 2009 to May 15, 2009

• We reviewed all charts in which there was a disagreement between the pediatric pulmonologist and the CDS tool relating to
  – Asthma control
  – Asthma severity for initial visits
  – Treatment step chosen

• Charts were reviewed by a physician who had knowledge about CDS and its use in the clinical setting

• Data reviewed included usage of each field on the CDS form, as well as demographic data about patient age, gender, race/ethnicity, and provider level of training

• The primary reason for each disagreement was determined and these reasons were categorized into a taxonomy of “reasons for disagreements.”
Quantitative Evaluation Results - Summary

- During evaluation period, there were a total of 445 visits for asthma care

<table>
<thead>
<tr>
<th>Visit Type</th>
<th>Provider Information</th>
<th>Patient Information</th>
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</thead>
<tbody>
<tr>
<td>55 new patient visits</td>
<td>186 by attending physicians (41.8%)</td>
<td>209 were white (47.0%)</td>
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<tr>
<td></td>
<td>138 by pulmonology fellows (31.0%)</td>
<td>104 were black (23.4%)</td>
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<td></td>
<td>121 by nurse practitioners (27.2%)</td>
<td>105 were Hispanic (23.6%)</td>
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<tr>
<td>390 return visits</td>
<td></td>
<td>174 were female (39.1%)</td>
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<td>Mean age was 7.9 years</td>
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Results - Asthma Control

• 307 of the 390 return visits (78.7%) had enough information to compare provider’s assessment with CDS

• Providers agreed with CDS 70% of the time (215 visits)

• In 80 of the 92 cases in which there was a disagreement, physicians assessed their patients as more well-controlled than the CDS
## Asthma Control Differences (92 Cases)

<table>
<thead>
<tr>
<th>Reasons For Disagreement</th>
<th>Examples And Notes</th>
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<tbody>
<tr>
<td>27 (29.3%) disagreements due to providers weighting information differently than CDS</td>
<td>Providers categorize a patient as being well controlled even though they noted that the patient had some limitation in normal activity</td>
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<tr>
<td></td>
<td>No clear reason why information was weighted differently. In most cases, there was only one factor (cough, SABA use, etc) which led to the discrepancy</td>
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<tr>
<td>50 (54.3%) disagreements due to “symptoms not attributed to asthma”</td>
<td>Providers would document that the patient was experiencing cough daily, but they would attribute the cough to a upper respiratory infection and not to the patient’s asthma</td>
</tr>
<tr>
<td>13 (14.1%) disagreements due to “free text documentation”</td>
<td>Providers would document certain symptoms in the free text portion of the history of present illness but would not check the corresponding boxes on the CDS screen</td>
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<tr>
<td>2 (2.2%) disagreements due to “symptoms due to inadequate treatment adherence”</td>
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Results - Asthma Severity

• Of the 55 new patient visits, 34 visits (61.8%) had enough information to compare provider’s assessment with CDS

• In 15 (44.1%) of the 34 visits, providers agreed with CDS

• Of the 19 (55.9%) visits in which providers disagreed with CDS
  – 13 clinicians assessed their patients as having less severe asthma than CDS
  – 6 clinicians assessed their patients as having more severe asthma than CDS
## Asthma Severity Differences

<table>
<thead>
<tr>
<th>Reasons For Disagreement</th>
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</thead>
<tbody>
<tr>
<td>12 (63.2%) cases providers weighted information differently than CDS tool</td>
</tr>
<tr>
<td>3 (15.8%) cases the disagreement was due to free text documentation</td>
</tr>
<tr>
<td>2 (10.5%) cases the disagreement was due to a response to treatment initiated prior to seeing a pulmonologist</td>
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<tr>
<td>1 case a patient had been diagnosed with moderate persistent asthma prior to seeing the pulmonologist</td>
</tr>
<tr>
<td>In 1 case, the reason for the disagreement could not be determined</td>
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</table>
Results – Treatment Step

- Providers agreed with the CDS tool assessment in 6 (28.6%) of 21 cases

- Providers chose a lower treatment step than the CDS tool in 6 cases and a higher step in 9 cases

<table>
<thead>
<tr>
<th>Reasons For Disagreement</th>
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<tbody>
<tr>
<td>9 (56.3%) disagreement was due to a disagreement regarding the severity of the patient’s asthma - for example, it the provider felt the patient had more severe asthma than the CDS tool, the provider chose a more intensive treatment step</td>
</tr>
<tr>
<td>4 (25.0%) disagreements due to provider stepping up treatment because the patient was inadequately controlled on the current treatment</td>
</tr>
<tr>
<td>2 (12.5%) disagreements due to symptoms not being attributed to asthma leading the provider to choose a different step than CDS</td>
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<tr>
<td>1 (6.3%) disagreement due to the patient only requiring seasonal treatment of asthma leading to the disagreement</td>
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</table>
Quantitative Evaluation Discussion

• When clinicians disagreed with CDS they tended to assess their patients as having less severe asthma and asthma which was more well-controlled than the CDS

• Majority of disagreements over asthma control were due to symptoms not attributed to asthma
  – Provider attributed cough to allergic rhinitis, GERD, URI or other causes, rather than Asthma
  – CDS tool unable to appreciate this differentiation

• Guidelines are difficult to apply in actual practice

• EPR-3 guidelines provide an effective basis for assessing consistency of clinician decisions

• CDS forms provide an effective basis for automating assessment of clinician decisions
Qualitative Evaluation

• We performed direct observation, at
  – Approximately four months post-implementation (May 2009) and
  – At nine months post-implementation (September 2009)

• Observation periods lasted between thirty and forty-five minutes, during which we noted each “smart form” screen accessed by each clinician

• We performed individual, semi-structured interviews of all nine pediatric pulmonologists between May 2009 and July 2009
Results

• Clinicians do not use the computers in the exam rooms

• Clinic workflow is still primarily paper-based
  – Patients complete Interval History form in waiting room
  – Interval History form drives information flow
  – Clinicians take notes on Interval History form

• Clinicians limit computer use in conference rooms to
  – Review of patient medications
  – Generation of asthma action plans
  – Printing prescriptions

• CDS “smart forms” were generally used for documentation purposes after patient care decisions had been made, and were only completed once clinic sessions had ended
  – Only one clinician entered data about clinical history and then used CDS while the patient was still in clinic
Results

• We found four reasons for “delayed use” of CDS:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Summary</th>
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<tbody>
<tr>
<td>Clinical</td>
<td>Misgivings about the value of the guidelines and CDS “smart forms”</td>
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<tr>
<td>Social</td>
<td>Concerns that computer use during the patient encounter adversely affects patient-clinician relationship</td>
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<tr>
<td>Technical</td>
<td>Computers are slow, noisy and distracting</td>
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<tr>
<td>Workflow</td>
<td>Clinic workflow is primarily paper-based, therefore CDS during care use will be disruptive</td>
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</table>
Clinical Factors

• Key Themes Expressed
  – Clinical practice guidelines are starting points, not endpoints, for clinical care
    • “Guidelines are guidelines”
    • Caution regarding computer-based CDS
  – Patients’ clinical scenarios more complex than scenarios encountered by primary care providers
  – Pediatric pulmonologists are experts who do not need decision-support for asthma management

➡️ Opportunities
  – Quantitative evaluation suggests there is value in measuring and comparing clinician decisions to EPR-3 guidelines
  – Clinical performance is increasingly measured against standard goals
  – Provide individual reports for clinicians noting their decision-making consistency and inconsistency with the guidelines, including reasons and trends
Social Considerations

• Key Themes Expressed
  – Computer use during the patient encounter adversely affects the patient-clinician relationship
  – Good patient rapport requires clinician’s full attention
    • This cannot be maintained if the clinician is busy viewing the computer screen or clicking for structured data entry
    • Specialty care patients often represent diagnostic or therapeutic challenges, and pediatric pulmonologists must provide a level of care not yet experienced by the patients

→ Opportunities
  – Experience of other clinicians (at Yale and elsewhere) suggest these problems can be overcome
  – Use of a smaller device (e.g., a computerized tablet) could mitigate these risks
Technical Factors

• Key Themes Expressed
  – Computers in exam room often more distracting than helpful
  – Computers are very noisy and sometimes are not working
  – Clinicians leave the exam room to use functioning computers in conference rooms
  – Computers help with letters back to referring physicians, but current computer-generated letters require significant editing

➡️ Opportunities
  – Replace clinic computers with higher-speed machines or tablets
  – Redesign CDS menus, to enable individual forms to be selected as required, rather than walking through entire sequence
  – Redesign letter to limit amount of re-editing required, and to make generation of a finished letter a positive incentive to using the CDS
  – Resolve remaining limitations with current medication screens
  – Make generation of the letter and use of medication screens conditional on completing the CDS form set
Workflow Factors - Key Themes Expressed

• Computer use can disrupt clinic workflow

• Computer use can slow the pace of seeing patients
  – “Smart forms” seem to only impede clinic workflow
  – “intrusive and clunky”

• Extra visit time better spent with extra history-taking and patient education rather than extra computer use
  – For example, inhaler technique coaching
Workflow Factors - Opportunities

• Clinic currently has “worst of both worlds”
  – Paper workflow with computer use for documentation of decisions

• Expectations of EMR and CDS system usage becoming more rigorous under “Meaningful Use”

• There is potential to redesign the clinical workflow to support more active use of computer during care

• Several options to automate patient data capture
  – Automate Interval History form via waiting room kiosk
  – Scanning and character recognition technologies to capture Interval History Form
  – Other workflow and data entry timing changes to capture patient information prior to clinic
  – Clinician captures information directly from patient during visit

November 20, 2009  GLIDES Asthma At Yale Specialty Clinic
In Closing

• Evaluation of Asthma CDS at the Yale pediatric pulmonology clinic identified several opportunities for improvement
  – Continue to use CDS as a basis to measure improve consistency of clinician decisions
  – Change clinical workflow to use computers during delivery of care
  – Improve technical quality and capabilities of CDS, to encourage greater use

• There is potential to focus GLIDES project “Year 3 Funding” on addressing these challenges, if clinicians are open to such a change...