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

Evaluation	Who	Type
Assessment of pulmonologist's decisions alignment with CDS decision recommendations	Laura Hoeksema Leora Horwitz	Quantitative: Review of charts and Centricity data
Assessment of pulmonologist's experience of using CDS, with a focus on sub-specialty themes	Ed Lomotan Leora Horwitz Diana Edmonds	Qualitative: Direct observation and user interviews

- 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

Visit Type	Provider Information	Patient Information
55 new patient visits 390 return visits	186 by attending physicians (41.8%) 138 by pulmonology fellows (31.0%) 121 by nurse practitioners (27.2%)	209 were white (47.0%) 104 were black (23.4%) 105 were Hispanic (23.6%) 174 were female (39.1%) Mean age was 7.9 years

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)

Reasons For Disagreement	Examples And Notes
27 (29.3%) disagreements due to providers weighting information differently than CDS	Providers categorize a patient as being well controlled even though they noted that the patient had some limitation in normal activity

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 |
50 (54.3%) disagreements due to "symptoms not attributed to asthma"	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
13 (14.1%) disagreements due to "free text documentation"	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
2 (2.2%) disagreements due to "symptoms due to inadequate treatment adherence"	

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

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

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

Reasons For Disagreement
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
4 (25.0%) disagreements due to provider stepping up treatment because the patient was inadequately controlled on the current treatment
2 (12.5%) disagreements due to symptoms not being attributed to asthma leading the provider to choose a different step than CDS
1 (6.3%) disagreement due to the patient only requiring seasonal treatment of asthma leading to the disagreement

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

Factor	Summary
Clinical	Misgivings about the value of the guidelines and CDS "smart forms"
Social	Concerns that computer use during the patient encounter adversely affects patient-clinician relationship
Technical	Computers are slow, noisy and distracting
Workflow	Clinic workflow is primarily paper-based, therefore CDS during care use will be disruptive

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

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...