Goals of the GLIDES Project

1. Implement evidence-based guideline recommendations that address *prevention* of *pediatric obesity* and *chronic management* of *asthma*
Selected Guidelines

• Asthma
  – EPR3 *Diagnosis and Management of Asthma* from the NHLBI (2007)
  – Demonstrates challenges involved in implementation of recommendations for chronic management of complex disease

• Obesity
  – *Screening and Interventions for Overweight in Children and Adolescents* (2007) from the Expert Committee on the Assessment, Prevention, and Treatment of Child and Adolescent Overweight and Obesity
  – Convened by the AMA, HRSA, and CDC
Severity

- Intermittent
  - Step 1
    - Eval control
    - 2-6 wk

- Mild Pers
  - Step 2
    - Eval control
    - 2-6 wk

- Mod Pers
  - Step 3
    - Eval control
    - 2-6 wk

- SevPers
  - Step 4, 5
    - Eval control
    - 2-6 wk
Order Set

Selected Treatment Step: 3

Quick-Relief
Short acting B-2 agonist
ALBUTEROL NEBS 0.083% Q4 hrs PRN

Long Term Control
Preferred
1. Low-dose inhaled steroid
PULMICORT 0.25 MG BID

or
LTRA

or
2. COMBO:

3. Medium-dose inhaled steroid

Added: Albuterol sulfate 0.083 % nebu 2.5 mg .5cc with 3cc NS nebulized every 4 hours
Added: Pulmicort 0.25 mg/2ml susp 0.25 MG/ML nebulized twice a day
Goals of the GLIDES Project

1. Implement evidence-based guideline recommendations that address prevention of pediatric obesity and chronic management of asthma

2. Apply GEM (Guideline Elements Model) and its associated tools to systematically and replicably transform the knowledge contained in these guidelines into a computable format
Guideline Knowledge Modeling
Svatek & Ruzicka 2003

Model-Centered
- Knowledge engineer reads and assimilates the guideline narrative, formulates an internalized conceptual model, and gradually converts the model to a computable representation
- The translation process is implicit
- Ultimately, the relationship of the guideline knowledge model to the original guideline document may be only indirect or tangential

Document-Centered
- Relies heavily on the original textual guideline
- Explicit
- Iterative
- Produces a series of artifacts that can serve as an audit trail preserving relationship to original text
- “The leader in this stream is the GEM methodology and model.”
Challenge of Representing Guideline Knowledge Electronically

Published Guideline

Black Box

Computer-Based Decision Support
Identify Clinical Objectives
Select Guideline

Narrative Guideline

COGS, AGREE
GLIA

GEM Cutter Markup

Semi-structured

XML file
Quality & Implementability Appraisals

EXTRACTOR Transforms

Semi-formal

Statement logic
Coded decision variables & actions
Action-types

Local workflow / barrier analysis (technical, people, organizational); local codes; origins/insertions; CDS modality

Formal

Local EHR scripting language, UI
Tension between work that can be performed centrally vs locally
GEM

- **Knowledge model** for guideline documents
  - Multi-level hierarchy (>100 elements)
  - Parses heterogeneous information contained in guidelines
  - Facilitates translation of guidelines into a format that can be processed by computers
- GEM DTD adopted as ANSI standard (ASTM E2210-02)
- GEM II Schema adopted as ANSI standard (E2210-06)
Recent External Publications

Addressing GEM


GEM Uptake 2009

- GEM web site visits averaged 4,658 per month,
  - serving an average of 13,461 pages
  - 25,513 hits
  - Traffic is very stable.
- GEM Cutter downloads
  - 93 times
  - from 25 different countries
• University of Udine
• University of Vienna
• Sentry Data Systems
• Regenstrief Institute
• Fremantle Hospital & Health Service
• Renaissance Computing Institute
• St. Georges Hospital and Medical School
• Answare Ltd.
• I-CUBE
• Banner Health
• Thomson Reuters
• Cincinnati Children's Hospital Medical Center
• ECRI Institute
• Arizona State University
• Bologna University
• Fremantle Hospital Library
• CHHMPA
• Interamerican University of PR
• University of Pittsburgh
• Oregon Health & Science University
catholic medical center
• Center for Interoperable EHR
• PROGESAL Ltd. Consulting Office
• Seoul National University
• Vanderbilt University
• Umass
• MoH
• Università degli studi di Pavia
• University of Georgia
• VA
• Mayo Clinic
• HRR PEMEX
• Paris Decartes
• College of American Pathologists
• JHU
• McMaster University
• Universidad Nacional de Colombia
• National Guideline Clearinghouse
• Milliman CareGuidelines
• New Zealand Guidelines Group
• Centre for Health Informatics UNSW
• Technical University of Vienna
Goals of the GLIDES Project

1. Implement evidence-based guideline recommendations that address prevention of pediatric obesity and chronic management of asthma.

2. Apply GEM and its associated tools to systematically and replicably transform the knowledge contained in these guidelines into a computable format.

3. Deliver the guideline knowledge via electronic decision support at ambulatory sites that employ Centricity EMR at Yale and EpicCare at Nemours.
Deliver the Guideline Knowledge

• Demos to follow
Implement evidence-based guideline recommendations

• **Chronic Management of Asthma**
  ✓ Pediatric Pulmonology: Yale
  ✓ Pediatric Primary Care: Yale
  ✓ Nemours Pulmonology: Florida sites
  ✓ Nemours Primary Care: Delaware Valley sites

• **Prevention of Obesity**
  ✓ Pediatric Primary Care: Yale
  ✓ Nemours Primary Care: Delaware Valley sites
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4. Evaluate the fulfillment of these goals and the effectiveness of the decision support tools in improving the quality of health care
Evaluation Approaches

• Quantitative evaluation: *what*
• Qualitative evaluation: *why*
• Mixed methods evaluation plan:
  – data completion rate
  – direct observation
  – survey of clinicians
  – in-depth interviews
  – review of charts in which clinicians did not follow CDS recommendations
• Evaluation of clinical outcomes: years 3-5
Use

- Uptake of asthma CDS at Yale pulmonary has been generally high; however, tools are often used after the clinic visit is over (Jan-May 2009)
  - 55 new visits: 78% had enough data entered for CDS to work
  - 390 return visits: 65% had enough data entered for CDS to work
- Uptake of asthma CDS at Nemours has been generally low; attributable to lack of a clinical champion
- Uptake of obesity CDS at Nemours has been good
Effectiveness of CDS

- CDS prompts high use of key guideline recommendations:
  - Yale obesity (819 visits)
    - 83% document screen/counsel for >5 servings fruits/vegetables
    - 75% document screen/counsel for no sugar-sweetened beverages
  - Yale pulmonology (390 visits)
    - 90% document “impairment”
    - 88% document “risk”
- Experts do not always agree with CDS
Goals of the GLIDES Project

1. Implement evidence-based guideline recommendations that address *prevention* of *pediatric obesity* and *chronic management* of *asthma*

2. Apply GEM and its associated tools to *systematically* and *replicably* transform the knowledge contained in these guidelines into a computable format

3. Deliver the knowledge via electronic decision support at ambulatory sites that employ Centricity EMR at Yale and EpicCare at Nemours

4. Evaluate the fulfillment of these goals and the effectiveness of the decision support tools in improving the quality of health care

5. Disseminate the findings and lessons learned
DISSEMINATE

- MANY presentations
- Recommendations to CCHIT, vendors
- Guideline manual
- IOM Committee “Developing Standards for Trustworthy Clinical Practice Guidelines”
- ECRI pilot: GEM-ifying guidelines for NGC
- GLIDES Website
http://gem.med.yale.edu/glides
Proposed Aims: Years 3-5

1. Continue to use systematic and replicable processes to design, implement, and demonstrate guideline-based CDS
2. Work with guideline developers to provide tools and guidance to improve guideline development
3. Update GEM and increase its adoption
4. Continue evaluation of both existing and newly developed CDS implementations
5. Collaborate with CDSC to pilot distribution of CDS
6. Disseminate lessons learned
LET'S GET TOGETHER
Guidelines International Network Conference 2010

Chicago
August 25-28, 2010
www.gin2010.org
Thank You!

http://ycmi.med.yale.edu/people/shiffman.html

richard.shiffman@yale.edu