Clinical Decision Support
Technical Expert Panel Meeting

• June 1, 2011
• 1:00 PM - 3:00 PM Eastern Time
• Facilitator: Scott Finley
 Agenda

• Welcome & Introductions
• Review of February’s TEP Meeting
• Contractors’ Status Reports & Discussion
  • CDSC
  • GLIDES
• Long-Term Deliverables for Lasting Impact and SynchronizationEfforts
  • CDSC
  • GLIDES
  • Discussion
• Recap & Next Steps
Welcome
Review Of February’s TEP Meeting
Clinical Decision Support Consortium
Technical Expert Panel
Teleconference

Blackford Middleton, MD, MPH, MSc
Lana Tsurikova, MA, MSc

June 1, 2011
Agenda

• **Status Update** (5-10 min)
  – Progress and Accomplishments
  – Challenges Overcome

• **Discussion** (10 min)

• **Long-Term Deliverables for Lasting Impact and Synchronization Efforts** (10 min)

• **Questions for the Technical Expert Panel (TEP)**
ACCOMPLISHMENTS
Task 1. Program Management

• Submitted Option Year Two (OY2) and Option Year Three (OY3) Technical Proposal, budget and budget justification to the Brigham and Women’s Hospital (BWH) on 5/2/2011.

• BWH plans on submitting the set of documents to the Agency for Healthcare Research and Quality (AHRQ) on 5/30/2011.

• Prepared customized presentations on Clinical Decision Support Consortium (CDSC) work in OY2 and OY3 and shared with each of the CDSC teams leads.
ACCOMPLISHMENTS

Task 2. Implementation

Subtask 2.1 Demonstration of Clinical Decision Support (CDS) service at two organizations

• Partners Healthcare System (PHS) sent the final version of the Service Sharing Agreement to Regenstrief Institute (RI) on 5/9/2011.

• The RAND/BWH Advanced CDS (ACDS) project team has been working with the Jerry Osheroff and the eRecommendations (eRecs)/Structured Care project. The Portal Publishing Agreement has been sent to AHRQ for signing. Once it is signed, we will publish the eRec specs on CDSC Knowledge Management (KM) Portal.

• Moved Enterprise Clinical Rules Service version 2 (ECRSv2) to production. Ready for use as of April 5, 2011.

• Reduced timeout thresholds for classification and Continuity of Care Document (CCD) Factory services calls by ECRS for this project, to ensure service performance stays within Longitudinal Medical Record (LMR) acceptable limits.
ACCOMPLISHMENTS
Task 2. Implementation

Subtask 2.1 Demonstration of CDS service at two organizations (cont.)
- Installed public version of RI digital certificate at PHS. Begun testing with RI in Quality Assurance (QA) environments.
- CareWeb is in production and beginning to be used by clinicians who will participate in the CDSC trial.
- Data caching solution moved to production, ready for use as of May 3, 2011.

Subtask 2.2 Other implementation projects

Knowledge Translation and Specification (KTS) team:
- Defined a model for embedding the terminology “Value Set”;
- Developed prototypes for extended document types/schemas, value sets, wrappers for Level 4 (L4) comment;
ACCOMPLISHMENTS
Task 2. Implementation

Subtask 2.2 Other implementation projects

KTS team (cont.):

• Developed a plan for gathering stylesheet user requirements for knowledge engineers (KE), Subject Matter Experts (SME), and developers;

• Developed a joint with Advanced CDS contract eRoom database to keep track of proposed changes to the model, schema, and editor as well as to ensure data and knowledge sharing across and between teams;

• Developed prototype Guideline Element Model (GEM) to Level 2 (L2) and eRecs to Level 3 (L3) import into editing tool;

• Added a model for definitions to structured recommendations L3 to support value sets;

• Presented demo of authoring tools for Content Governance Committee (CGC) to achieve efficient L3 implementations of L4 artifacts, and for CDSC Research Committee;
ACCOMPLISHMENTS

Task 2. Implementation

**Subtask 2.2** Other implementation projects (cont.)

KTS team (cont.):
- Developed order set stylesheet; and
- Proposed a scope and representation model for infobutton that is based on the analysis of infobutton specification from Health Level 7 (HL7) and implementations of that specification.

Services team
- Reviewed and updated documentation for Extensible Markup Language (XML) documents;

Dashboard team:
- Developed Site Assessment questions, based on barriers experienced by PHS;
- Developed Dashboard Implementation Guide.
ACCOMPLISHMENTS
Task 2. Implementation

CGC:

- Held its first face-to-face meeting on 3/5/2011 in Boston. During the meeting CGC addressed the editorial policy, future projects and funding opportunities for the CGC, CGC membership policies, knowledge authoring, and strategies for prioritizing rules. The meeting was empowering for the CGC and renewed the commitment and effort of its members;

- Summarized the outpatient, health maintenance and/or chronic disease rules and reminders submitted by Mid-Valley Independent Physicians Association (MVIPA), Kaiser Permanente (KP), PHS, and the Department of Veterans Affairs (VA) to the eRoom for the rule prioritization effort;

- Made a progress on the editorial policy in the areas of membership to the CGC, its implications for the KM Portal, and minor wordsmith of the entire policy; and

- Created work groups for the following areas to push development: top rule prioritization and RI L4-L3 transformation.
ACCOMPLISHMENTS

Task 3. Evaluation

**Subtask 3.1 Evaluation Plan EVA 3.1 (ongoing activities)**
All teams completed and submitted draft evaluation reports.

**Subtask 3.3 Conduct evaluation activities as specified in the final Evaluation Plan**
- Knowledge Management Lifecycle Assessment (KMLA) team submitted report on the PHS site visit, completed the site visit to RI and started data analysis.
- Developed a 10 question “Lessons Learned” Assessment Tool for PHS KEs who work with different knowledge layers.
- Created and tested database for storing input CCD and output recommendation data for PHS consumers. Received additional data from PHS warehouse to model baseline performance for CDSC reminders.
- Completed multivariate analysis of data from PHS demo to control for baseline clinic characteristics and secular change in reminder performance. There still appears to be increased performance in the CDSC clinics.
- Completed testing of new ECRSv2 in LMR. Performance test now in progress. New ECRS will be implemented in May, 2011 with LMR Spring release.
ACCOMPLISHMENTS

Task 3. Evaluation

Subtask 3.3 Conduct evaluation activities as specified in the final Evaluation Plan (cont.)

• CareWeb at RI is now live, and testing in progress for three physicians. Once this test is complete, and all remaining (minor) integration and legal hurdles are cleared, we will turn on the CDSC Services at RI. Developed a risk of mitigation plan for potential risk in go live of CDSC demo at RI.

• Scheduled and conducted an in-service training at the PHS clinics that have access to the CDSC provider Dashboard.

• Conducted presentation on CDS Dashboard for KM team and Clinical Content Committee (CCC).

• Started dashboard user evaluation. Developed set of Dashboard User interview questions and conducted semi structured interviews.
# CDSC Usage Summary Statistics to Date

## CDSC KM Portal Statistics

<table>
<thead>
<tr>
<th></th>
<th>April, 2011</th>
<th>Since February, 2010</th>
<th>Most Viewed Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Published</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assets</td>
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<td>Unique IP Addresses</td>
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<td>516</td>
<td>CDSC-Diabetes-L4-PHS-2010-L4EXP-1.0-090221fe8001692a.pdf</td>
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<tr>
<td>Number of Visits</td>
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<td>788</td>
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</table>

## CDS Dashboards Usage Summary

### Usage for: 4/27-5/10/2011

<table>
<thead>
<tr>
<th>Provider View</th>
<th>3 times by 3 unique people</th>
<th>200 times by 105 unique people</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(mainly physicians but also nurses, NPs and quality staff)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 people used it once</td>
<td>70 people used it once</td>
</tr>
<tr>
<td></td>
<td>-----------------------------</td>
<td>17 people used it twice</td>
</tr>
<tr>
<td></td>
<td>-----------------------------</td>
<td>7 people used it three times</td>
</tr>
<tr>
<td></td>
<td>-----------------------------</td>
<td>11 people used it four or more times</td>
</tr>
<tr>
<td>Designer View:</td>
<td>2 time by 2 unique people</td>
<td>8 times by 6 unique people</td>
</tr>
<tr>
<td></td>
<td>2 person used it once</td>
<td>5 people used it once</td>
</tr>
<tr>
<td></td>
<td>-----------------------------</td>
<td>1 person used it three times</td>
</tr>
</tbody>
</table>
ACCOMPLISHMENTS

Task 4. Meeting with TEP

**Subtask 4.1 In-person TEP meeting (February 2-3, 2011)**

- Principal Investigator (PI) and Research Program Manager (RPM) participated in TEP meeting by phone due to the weather.
- Tonya Hongsermeier (KM Portal team lead) and Lana Tsurikova (RPM) presented on CDSC legal issues at TEP meeting.

**Subtask 4.2 TEP Teleconference (June 1, 2011)**

- Research Management Team (RMT) prepared and submitted materials for the next TEP teleconference meeting.
ACCOMPLISHMENTS

Task 5. Dissemination

Subtask 5.3 Carry out dissemination activities as described in final Dissemination Plan

- Submitted draft of three recommendations to AHRQ: Quality measure developers, Clinical professional organizations, and Health IT Policy recommendations.
- Submitted the revised manuscript on the multilayer model to the Journal of the American Medical Informatics Association (JAMIA) in January.
- CDSC representatives presented at Healthcare Information and Management Systems Society (HIMSS) on CDSC progress, meet with vendors for dissemination, and gather data on vendor CDS services capabilities.
- KMLA team resubmitted JAMIA case study about MVIPA and submitted the AMIA draft of the CDS content vendor paper: Ash JS et al, Studying the Vendor Perspective on CDS.
- KM team provided materials to NextGen and General Electrics (GE) to help them understand the content of the CDSC rules, the structure of the L3 spec and the work they need to perform to integrate with the CDSC rules.
**OY1 Dissemination**

**CDSC Journal Publications**


CDSC Conference Papers


CDSC Conference Posters


3. Turechek Z, Maviglia S, Wright A, Saleem J, Simonaitis L, Fraser G, Krall M, Sonnenberg F, Middleton B. Sharing is caring: Why collaboration is the key to overcoming decision support content management and development barriers. Poster session presented at: AMIA Annual Symposium; 2010 Nov 13-17; Washington, DC.
ACCOMPLISHMENTS
Task 6. OY1 Progress Report

Subtask 6.1 Submit Draft Option Year One (OY1) Report

- The CDSC project teams prepared their draft reports detailing the team’s progress in OY1 and submitted to RMT.
- RMT collated the reports submitted by teams in the draft of the report and submitted to AHRQ for review.
- AHRQ returned their comments on the OY1 report.
- CDSC works to address the comments and to add pieces that were developed and finalized since the draft submission.
Challenges
CHALLENGES

Task 2. Implementation

**Subtask 2.1 Demonstration of CDS Service at two organizations**

- RI service demonstration will start only after legal agreements are signed, ECRSv2 is in production and integration testing is completed.

- CDS Services team had a recent discussion about expanding the PHS Systematized Nomenclature of Medicine (SNOMED)-based problem/procedure subsets to include International Classification of Diseases - 9th or 10th Edition (ICD9/10) and Current Procedural Terminology (CPT) codes as a part of OY2. This may require that the legal agreements be expanded or a new Content Development Agreement be drafted.

- RI has obtained a third-party certificate and has installed it on their production server. However, they do not have a second certificate to use in QA and they can’t use production since the legal agreements have not yet been signed.

- PHS will be required to encrypt patient CCD data that will be stored in the PHS research database.
CHALLENGES
Task 2. Implementation

**Subtask 2.1 Demonstration of CDS Service at two organizations (cont.)**

- During the spring of 2011, RI is implementing a new electronic health information infrastructure (CareWeb) at Wishard Health Services. CDSC Notifications can only be displayed in those settings where the infrastructure is enabled. Any delays or changes in the implementation of the infrastructure have a direct effect on the implementation of the CDSC Notifications.
- To date PHS has experienced challenges with the ECRS accepting the third-party signed digital certificate.
- The display of CDS reminders relies on a beta version of a new Computerized Provider Order Entry infrastructure. Although it appears stable, this beta version may require temporary suspension from time to time for software improvements.

**Subtask 2.2 Other implementation projects**

- Limited access to project specific eRooms has complicated collaboration efforts with the ACDS project in developing a unified model. The two teams are collaboratively building a Knowledge Modeling Collaboration and Research eRoom in order for the teams to share research and working documents (Unified Modeling Language (UML) models, XML schemas, etc).
CHALLENGES
Task 2. Implementation

Subtask 2.2 Other implementation projects
- Obtaining sign-off for the Portal Publishing Agreement from MVIPA and University of Medicine and Dentistry of New Jersey (UMDNJ) requires time.
- Decision is needed whether infobutton knowledge should be modeled as “rules” using logic or as “tags” using metadata elements.

Subtask 3.3 Conduct Evaluation Activities
- Organizing and cleaning the PHS Demo data to ensure accuracy and consistency is more time-consuming than was anticipated.
- We need additional data from our data warehouse to model baseline performance in the CDSC intervention clinics – this data has been requested but we have not yet received it.
- No new guideline content is being developed in OY1 which impacts the KTS team’s ability to evaluate its work on the Knowledge Authoring Tool.
CDSC Findings, Lessons, and Questions
CDSC Findings and Lessons Learned

RI team discovered that:

– Meaningful Use is causing many delays as our health care partners rapidly transition from existing systems to new systems which are certified for meaningful use. Research and development projects take a back seat to initiatives that will result in financial benefits for health care providers.

– The legal road for a general service to provide CDS by an external entity (not just access to the rules) has not been paved previously. Liability and indemnification remain issues, especially in the wake of the recent AMIA workshops and papers denouncing “hold harmless clauses” in software and service contracts.

KM team discovered there is a significant amount of preparation work that the external CDSC members must do prior to integrating with the CDSC content. It is critical that KM be included in the discussions with the CDSC members early on to get this work started.
Services team discovered that caching of reference data improved performance of classification services to acceptable limits by reducing the number and complexity of such calls made from within ECRS.

CGC discovered that face-to-face interaction for teams is extremely important. Without such interaction, efforts can wane and members can feel a loss of accountability to their work, especially when members are separated by such long distances and only meet via teleconference.

Demonstration team discovered that data from the CDS Dashboards can be reused for the demo analysis.
Status Reports
Contents

• Current Project Status
  • Progress
  • Accomplishments
  • Challenges Overcome
  • Questions for TEP

• Models, Processes and Tools for Lasting Impact and Synchronization

GLIDES Project Overview
Project Timeline

Knowledge Transformation (KT)

Asthma
Obesity

Implementation I

Asthma
Yale Specialty

Implementation II

Obesity
Yale PC
Delaware PC

Asthma
Nemours
Florida Sites

Implementation III

Asthma
Yale Primary Care

Obesity
Nemours Delaware

Evaluation and Dissemination

Years One-Two CDS Implementation Projects
Feb 2008 – Jan 2010

Option Year 1 CDS Projects
Mar 2010 – Apr 2011

Geisinger Implementation

KT
Design
Build
Adult Low Back Pain

CHOP Implementation

KT
Design
Medical Home – Preterm Infants

AAO-HNS

BridgeWiz – Sudden Hearing Loss

AAP

BridgeWiz – AOM, Fever, Sinusitis
Evidence Report, Performance

GEM/GLIA Development

Literature Review
New Release

ECRI

Guideline Mark-Up,
GEM Cutting
Plan For
NGC Delivery
Progress Summary
Option Year 1

• Met all Option Year 1 plan expectations for activities and deliverables, within schedule and budget expectations
  – Knowledge generation (knowledge acquisition and representation)
  – Knowledge transformation
  – Knowledge implementation and evaluation
Knowledge Generation

Goal: Improve the quality, transparency, and validity of guidelines as knowledge sources

Progress and Accomplishments

Worked with two national guideline development organizations —American Academy of Pediatrics (AAP) and American Academy of Otolaryngology-Head and Neck Surgery (AAO)—to design, implement and pilot processes and tools intended to make guidelines clearer and more implementable

- BRIDGE-Wiz was piloted successfully at both AAP and AAO with 5 national panels (AOM, Sinusitis, OSA, T2DM)
- Completed update of Guideine Implementability Appraisal (GLIA) v 2.0 incorporating feedback from users
- Overhauled user interface to eGLIA and released eGLIA 2
- Plans are underway for tool adoption by a wider group of guideline developers
- Participated in IOM Committee to develop standards for trustworthy guidelines
Knowledge Generation

Challenges Overcome
• How to engage disparate stakeholder groups in understanding and applying new opportunities for tools and processes
  – Demonstrate working tools, leading to hands-on trial by stakeholder groups in facilitated meeting

Next Steps (Option Year 2)
• Continue to support AAP and AAO’s adoption of these tools
• Work with two more guideline developers (short-list includes NHLBI, ATS, AUA, ASCO, ACEP, ACCP and Decide)
• Prepare for broader roll-out of these tools
• Integrate BridgeWiz with GEM

Questions for TEP
• What insights or suggestions can you offer that can help us scope the integration of BridgeWiz and GEM tools?
• What suggestions does TEP have regarding developer partners for OY2?
Knowledge Representation

Goal: Create a new version of GEM reflecting input from key users

Progress and Accomplishments
• Documented concepts and requirements for a new release, reflecting literature search, needs for integration with BRIDGE-Wiz, NGC, and other models
• Participated in AHRQ-sponsored effort to assess, compare and align knowledge management systems with CDSC, eRec and other initiations
• ECRI interviewed and evaluated partners’ use of GEM (Geisinger, CHOP, Nemours)
• Evaluating options to accommodate GEM-parsed guideline content on NGC
• Paper summarizing GEM use (submitted to AMIA Proceedings)
• Considerations for new release of GEM, GEM Cutter, EXTRACTOR, etc developed
Knowledge Representation

Challenges
• “Marketing” GEM

Next Steps (Option Year 2)
• Enhance GEM’s ability to function in guideline development, implementation, dissemination and measurement environments
• Develop project plan and design prototype for modifications to NGC website to accommodate GEM-parsed guideline content
• Continue to support GEM improvement and promotion, reflecting input from all users

Questions For TEP
• What thoughts do you have regarding goals and approach to delivering GEM-parsed content via NGC web site?
Implementation Activities
Yale “iPad Kiosk” Status

Goal: Pilot ability to capture patient information directly from patients using iPad technology (for Asthma CDS); improve use of CDS by pediatric pulmonologists

Progress and Accomplishments
• Completed development and integration testing for iPad message to Centricity and iPad application
• Implemented system in controlled pilot for pulmonologists at Yale’s specialty clinic

Challenges Overcome
• How to work in pilot mode with new technology in corporate IT infrastructure

Next Steps (Option Year 2)
• Optimize and evaluate current pilot
• Consider expanding current capabilities (multi-media health coaching)

Questions For TEP
• What uses do TEP members see for tablet platform vis-à-vis CDS?
CHOP CDS Implementation

Goal: Design, develop and implement CDS for several guidelines associated with coordination of care for premature graduates in primary care practices

Progress and Accomplishments
- Finalized knowledge specifications for the Hearing Screening guidelines
- Programmed DROOLS rules engine using GemCutter output for ROP and Synagis
- Applied iterative Human Computer Interaction methods to design the intervention
- Engaged Faculty Practice clinic (20 clinicians, 5 sites) in design activities
- Implemented beta-version of CDS, completed initial usability assessment

Challenges Overcome
- Resolved local experts’ differences in interpretation of the Synagis guideline for prevention of respiratory syncytial virus in premies
- Controlling vocabulary and translation of concepts from "guideline-speak" to DROOLS engine/EPIC

Next Steps (Option Year 2)
- Complete and implement final releases for ROP and Synagis, including use case and usability testing
- Commence evaluation
- Prepare and publish implementation guide and technical appendix

Questions For TEP
- What areas are TEP members particularly interested in for a future demo of this capability?
Geisinger CDS Implementation

Goal: Design, develop and implement CDS for ICSI low back-pain guideline

Progress and Accomplishments
• Completed development and integration testing for CDS application
• Implemented e-health low back pain protocol in one of Geisinger’s clinics
• Phase I will provide necessary information on the content of the study tools, the use of the study tools, and modifications that may help phase II implementation

Challenges Overcome
• Clarified and supplemented vague logic in the original ICSI guideline
• Created nuanced language tables for each recommendation based on a set of covariates

Next Steps (Option Year 2)
• Expand coded guidelines to translate into rules for real time application of management recommendations based on patient reported data on back pain
• Audio-record the patient-provider dialogue of 40 consenting patients randomized to the eLowBackPain intervention group and 40 consenting patients randomized to the usual care group
• Evaluate recordings using the Roter Interaction Analysis System (RIAS)

Questions For TEP
• What areas are TEP members particularly interested in for a future demo of this capability?
Implementation

Other Initiatives For OY2

• Add one new implementation partner (potential for a Beacon)
• Continue to formalize the GLIDES “Methodology/Toolkit” for implementation, reflecting experience to date
• ECR I collecting experiences of GLIDES partners
• ECR I/Silverchair focused on dissemination of GEM-ified guidelines via NGC
Dissemination

Publications

In Revision
• Lomotan EA, Hoeksema LJ, Edmonds DE, Ramirez-Garnica,G, Shiffman RN, Horwitz LI. Mixed-methods evaluation of a decision-support System for pediatric pulmonologists
• Shiffman RN, Michel G, Rosenfeld R, Davidson C. Building better guidelines with BRIDGE-Wiz: a software assistant to promote quality, transparency, and implementability.

Submitted
• Hajizadeh N, Kashyap N, Michel, G, Shiffman RN. GEM at 10: A decade’s experience with the Guideline Elements Model
• Shiffman RN, Michel G, Kashyap N, Dixon M. A systematic and replicable approach to knowledge formalization.
Dissemination

Presentations

- **Composite Measures of Asthma Control: An End-user Perspective.** NIH Outcomes Workshop. Bethesda, MD. March 15, 2010
- **An Implementer at the Developers’ Table.** National Guidelines Clearinghouse / National Quality Measures Clearinghouse Advisory Group. Rockville, MD. April 7, 2010
- **An Implementer at the Developers’ Table.** AAP Steering Committee on Quality Improvement and Management, Rosemont, IL, October 30, 2010.
- **What’s in a Name? Transparency & the Current State of AAP Policies;** How do we assure that AAP policies are evidence-based when evidence exists? What are we doing now in grading evidence quality and recommendation strength and what are other developers doing? Staying ahead of the curve: 21st century policy development; How can we improve adoption of AAP policies? How should implementation of these changes be staged? AAP Mega-Meeting, Chicago, IL, December 10-11, 2010.

Posters

- In addition to these dissemination activities, GLIDES provided regularly updates to our website, and newsletters to stakeholders. GLIDES also participated actively in all in-person and teleconference TEP meetings, and complied with AHRQ expectations for annual reporting and policy recommendations.
Long-Term Deliverables for Lasting Impact and Synchronization Efforts
Long-Term Deliverables for Lasting Impact and Synchronization Efforts
Long-Term Deliverables for Lasting Impact and Synchronization Efforts

Planning for OY2 and OY3
Overview of OY1 Accomplishments

- Four-layer knowledge representation stack.
- Knowledge Authoring Tool (KAT).
- KM Portal for collating and browsing knowledge artifacts.
- Web-based CDS services.
- 6 month Pilot at PHS.
- Working with NextGen and GE to implement ECRS in their Electronic Health Records (EHRs).
- Devised a novel method for CDS performance assessment.
- CGC, clinical content governance, and editorial process.
- Legal agreements to support CDSC work.
- Disseminated our findings.
OY2 – OY3 Themes

- Continue work on improving the *translation* of knowledge in clinical practice guidelines into actionable CDS.
- Continue work on identifying the best ways to *represent* knowledge and data required to make actionable CDS content in human readable and machine readable and executable forms.
- Continue explore the best practices to *collate, aggregate, and curate* knowledge content for CDS in the KM portal. Work on the required tools to support KM and collaborative knowledge engineering.
- *Demonstrate* broad adoption of evidence-based CDS at scale.
- *Define and evaluate best practices* for CDS demonstrations. Assess how to incorporate CDS services at scale in a vendor and academic platforms. Evaluate how do we deploy CDS services in healthcare IT in a manner that improves CDS impact.
- *Broadly disseminate* the lessons garnered through the course of these investigations to key stakeholder audiences, including academic informatics, patient safety and quality, clinical professional societies, small office practice settings, and more.
Timelines

Base Year 1
- Apr
- Jul
- Oct
- Jan

Option Year 1
- Oct
- Jan
- Apr
- Jul

Option Year 3
- Oct
- Jan
- Apr
- Jul

BY1 2009
BY2 2010
OY1 2011
OY2 2012
OY3 2013

We are here
## OY2-3 Timeline – Task 1

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<tr>
<th>Project Name</th>
<th>Option Year 2</th>
<th>Option Year 3</th>
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<tbody>
<tr>
<td><strong>Task 1. Project Management</strong></td>
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<tr>
<td>CDSC Research, Financial and Project Management Support</td>
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<tr>
<td><strong>Work Plan</strong></td>
<td>OY2 Work Plan</td>
<td>OY3 Work Plan</td>
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<tr>
<td><strong>Project Plan</strong></td>
<td>OY2 Project Plan</td>
<td>OY3 Project Plan</td>
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<tr>
<td><strong>Attend in-person meeting with CDSC AHRQ PO</strong></td>
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<td>Monthly progress reports and meetings with PO</td>
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<td><strong>Other project management tasks required for supporting the contract work</strong></td>
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<td><strong>CDSC Legal Work</strong></td>
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# OY2-3 Timeline – Task 2.1

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<th>OPTION YEAR 2</th>
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<td><strong>Task 2. Implementation</strong></td>
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<td><strong>Task 2.1. Knowledge Management</strong></td>
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<td>Refinement and generalization of the knowledge stack</td>
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<td>Enhancements to the CDSC Knowledge Authoring Tool</td>
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<td><strong>New content development</strong></td>
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<td>RI Care Rules -&gt; Level 3, Reverse Engineering</td>
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<td>High Priority Rules -&gt; L2, Forward Engineering</td>
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<td>L2-&gt;L3s, Forward Engineering</td>
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<td><strong>New content implementation</strong></td>
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<td>Implementation of new content area L4s in CDS Service, Reverse Engineering (RI)</td>
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<td>Implementation of new content area L4s in CDS Service, Forward Engineering (UMDNJ)</td>
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<td>Publishing new content to KM Portal</td>
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<td>Support clinical content review, update and maintenance of content currently in production</td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Develop editorial policies and prioritization metrics for clinical content</td>
<td></td>
<td>Ongoing</td>
</tr>
</tbody>
</table>
### OY2-3 Timeline – Task 2.2

<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>OPTION YEAR 2</th>
<th>OPTION YEAR 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Task 2. Implementation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Task 2.2 CDS Service Implementation and Demonstration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support and maintenance of CDS Service and KM Portal for content and services</td>
<td></td>
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<tr>
<td>KM Portal support and maintenance</td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>CDS Services support and maintenance</td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Develop and implement solution for inclusion and use of ICD9 and CPT in CDS Service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phases 2 and 3 continuation of CDS Service demonstrations at PHS and RI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase 2 and 3 Demonstration at PHS</td>
<td>Phase 2</td>
<td>Phase 3</td>
</tr>
<tr>
<td>Phase 1, 2, and 3 Demonstration at RI Wishard</td>
<td>Phase 1</td>
<td>Phase 2</td>
</tr>
<tr>
<td>Phase 1 and 2 for EHR Vendor implementation and demonstration(s)</td>
<td>serv. impl.</td>
<td>Phase 1</td>
</tr>
<tr>
<td>Phase 1 and 2 with 1st EHR vendor (GE, NextGen, or Greenway)</td>
<td>serv. impl.</td>
<td>Phase 2</td>
</tr>
<tr>
<td>Phase 1 and 2 with 2nd EHR vendor (GE, NextGen, or Greenway)</td>
<td>serv. impl.</td>
<td>Phase 1</td>
</tr>
<tr>
<td>Phase 1 with 3rd EHR vendor or Beacon HIE</td>
<td>serv. impl.</td>
<td>Phase 1</td>
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</table>
## OY2-3 Timeline – Task 3

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Option Year 2</th>
<th>Option Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Task 3. Evaluation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation Plan</strong></td>
<td>OY2 Evaluation Plan</td>
<td>OY3 Evaluation Plan</td>
</tr>
<tr>
<td><strong>Coordinate evaluation and analysis across CDSC</strong></td>
<td></td>
<td></td>
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<tr>
<td>Evaluation of services implementation and demonstrations</td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>Evaluate editing/authoring tool by forward or reverse engineering rules</td>
<td></td>
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<tr>
<td>Analysis for open source – KM Portal, development of RFP</td>
<td></td>
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<tr>
<td>Analysis for open source - Rules Engine</td>
<td></td>
<td></td>
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<tr>
<td>Analysis for open source - CDS Dashboard</td>
<td></td>
<td></td>
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<tr>
<td>CDSC sustainability model</td>
<td></td>
<td></td>
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<tr>
<td>Site visits to the EHR provider/vendor and their customer sites</td>
<td></td>
<td></td>
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<tr>
<td>GE: Vendor virtual company visit (phone)</td>
<td></td>
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<tr>
<td>GE: Vendor Customer post-implementation in-person site visit</td>
<td></td>
<td></td>
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<tr>
<td>NextGen: Vendor virtual company visit (phone)</td>
<td></td>
<td></td>
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<tr>
<td>NextGen: Vendor Customer pre-implementation in-person site visit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NextGen: Vendor Customer post-implementation in-person site visit</td>
<td></td>
<td></td>
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<tr>
<td>Vendor 3 or HIE virtual visit (phone)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vendor 3 or HIE Customer pre-implementation in-person site visit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vendor 3 or HIE Customer post-implementation in-person site visit</td>
<td></td>
<td></td>
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<tr>
<td>Needs Assessment visit with Keystone HIE (Geisinger)</td>
<td></td>
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</tbody>
</table>
## OY2-3 Timeline – Tasks 4-9

<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>OPTION YEAR 2</th>
<th>OPTION YEAR 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Task 4. Meeting with Technical Expert Panel (TEP)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prepare and submit required materials and attend TEP meetings</td>
<td></td>
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<tr>
<td>In-Person TEP Meeting</td>
<td>Ongoing</td>
<td></td>
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<tr>
<td>Teleconference TEP meeting</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td><strong>Task 5. Dissemination Activities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dissemination Plan</td>
<td>OY2 Dissemination Plan</td>
<td>OY3 Dissemination Plan</td>
</tr>
<tr>
<td>Develop set of recommendations for the audiences specified in the contract</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td><strong>Task 6. OY2 and OY3 Report of Project Progress</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prepare and submit OY2 and OY3 report</td>
<td>OY2 Progress Report</td>
<td>OY3 Progress Report</td>
</tr>
<tr>
<td><strong>Task 7. Coordination with Other AHRQ Contractors</strong></td>
<td></td>
<td></td>
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<tr>
<td>Coordinate with designated NRC Domain 2</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td>Coordinate with and work closely with the Advancing CDS project, eRecs project, and AHRQ GLIDES project</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td><strong>Task 8. Ensuring High-Quality and 508-Compliant Deliverables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop and implement quality assurance procedures to ensure all deliverables to AHRQ are reviewed for quality control, professional writing, and copy editing</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td><strong>Task 9. Compliance with the Paperwork Reduction Act</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submit OMB Clearance Package to PO (if applicable)</td>
<td>Ongoing</td>
<td></td>
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</tbody>
</table>
Acknowledgements

Principal Investigator: Blackford Middleton, MD, MPH, MSc

CDSC Team Leads:
Research Management Team: Lana Tsurikova, MSc, MA
KMLA/Recommendations: Dean F. Sittig, PhD
Knowledge Translation and Specification: Aziz Boxwala, PhD
KM Portal: Tonya Hongsermeier, MD, MBA
CDS Services: Howard Goldberg, MD
CDS Demonstrations: Adam Wright, PhD
CDS Dashboards: Jonathan Einbinder, MD
Evaluation: David Bates, MD, MSc
Content Governance Committee: Saverio Maviglia, MD, MSc
Questions to TEP

- Are we on the right track for OY2 and OY3?
- Anything else that we should have considered?
Discussion

Thank You!
Long-Term Deliverables for Lasting Impact and Synchronization Efforts
GLIDES
(1) Models, Processes, and Tools for Lasting Impact
(2) Synchronization Potential

GLIDES PROJECT
GuideLines Into DEcision Support
sponsored by
The Agency for Healthcare Research and Quality
(1) Models, Processes, and Tools for Lasting Impact
(2) Synchronization Potential

Developed at YCMI over the past decade with support from AHRQ and the National Library of Medicine
Formalization Process

- **Knowledge About Appropriate Care**
  - BRIDGE-Wiz
  - **Narrative Guideline**
    - COGS, AGREE GLIA
    - GEM Cutter
  - **Semi-structured**
    - XML file
    - Quality & Implementability Appraisals
    - **EXTRACTOR Transforms**
  - **Semi-formal**
    - Statement logic
    - Coded decision variables & actions
    - Action-types
    - *Local workflow & barrier analysis; Local codes; Origins/insertions*
  - **Formal**
    - Logic encoded in local EHR scripting language;
    - User interface selections
BRIDGE-Wiz©
Building Recommendations in a Developer’s Guideline Editor

- Formalizes a process for writing implementable recommendations
- Focuses discussion
- Incorporates prompts based on COGS to improve guideline quality
- Controlled natural language
  - Offers verb choices based on action-type
  - Traps and disallows use of “consider”
  - Discourages “statement of fact” masquerading as recommendation
  - Limits boolean connectors to all ANDs or ORs in a statement
- Incorporates decidability and executability checks
- Requires systematic appraisal of evidence quality and benefit-harms
  - Suggests appropriate obligation term (deontic modal)
- Output includes a high-level “rule” and a recommendation profile
• GuideLine Implementability Appraisal©
• An instrument to identify obstacles to successful implementation

• Electronic GLIA©
• Facilitates asynchronous appraisal, consensus development, and reporting
Guideline Knowledge Representation

- **GEM©**: Guideline Elements Model
- Knowledge model for guideline documents in XML
- Set of >100 tags to represent guideline concepts
- Markup can be performed by non-programmers
- Human-readable, yet can be processed by machine

Schema is ANSI standard (ASTM E2210-06)
XML Tools

- **GEM Cutter©**
  - XML Editor
  - Enables parsing of guideline text into chunks compatible with GEM
  - Highlighting metaphor

- **EXTRACTOR©**
  - Set of XSL transforms
  - Displays “rules,” decision variables, actions

---

**RECOMMENDATION:** 5–11 Years of Age: Initiating Long-Term Control Therapy.

**Conditional:** 5–11 Years of Age: Initiating Long-Term Control Therapy.

The Expert Panel recommends daily long-term control therapy for children who have persistent asthma \(\text{REC}_3\).

**Decision Variable:** 5–11 Years of Age

**Decision Variable:** persistent asthma

**Action:** The Expert Panel recommends daily long-term control therapy

- **Risk/Harm:** possible long-term effects of inadequately controlled asthma
- **Risk/Harm:** possible adverse effects of medications given over prolonged periods

**Evidence Quality:** (Evidence A)

**Recommendation Strength:** The Expert Panel recommends
Synchronization

• Options

  – Continue to sponsor various models/tools/processes and allow the “implementation marketplace” to determine which is most effective, or which individual niches the various models should be applied to

  – Determine which model/tools/processes are most promising, and focus continue investment and development effort on those

• Continued discussion on harmonization and alignment may be interesting, but is unlikely to lead to a major change in trajectory of the current development plans for each model
Implementation

• A Methodology/Toolkit approach is a practical way to build a lasting model to guide CDS implementers
  – Foundational tools that can be integrated, flexibly, into local conditions (technology, clinical policy, workflow, etc)
  – Design guides and best practices that can be applied to specific areas of system design (eg. User interface, data capture techniques, testing models)
  – Sample work plans, templates, activity descriptions and other methodology tools
  – Like any lasting methodology, it should be “technology agnostic” not tied to any particular technology infrastructure

• Key question is how to build and formalize this Methodology/Toolkit, by taking the best concepts, examples and practices from AHRQ’s various CDS sponsored projects?
GLIDES Toolkit

GLIDES Project Overview
Long-Term Deliverables for Lasting Impact and Synchronization Efforts

Discussion
Recap and Next Steps
Thank You!