

Clinical Decision Support Technical Expert Panel Meeting

August 19, 2009
3:00 – 5:00 PM ET
Facilitator: Eta Berner

Agenda

- ❖ Welcome
- ❖ Review of June 26 TEP Meeting at AHRQ
- ❖ Discussion of Contractors' Status Reports
 - Progress and accomplishments; challenges, with a focus on technical challenges; questions for the TEP; and next steps*
 - I. GLIDES
 - II. CDSC
- ❖ Recap

Review of June 26th TEP Meeting at AHRQ



GLIDES UPDATE

August 19, 2009

GLIDES PROJECT

GuideLines Into DEcision Support

sponsored by
the Agency for Healthcare Research and Quality



Yale School of Medicine



Summary

- GLIDES CDS now live in multiple locations in CT, DE, FL
- We are on schedule and within budget for first 18 months of contract
- Continuing to focus on
 - Roll-out of Phase II CDS deliverables at Yale and Nemours
 - Evaluation of Phase I Asthma CDS at Yale Specialty Clinic
 - Phase III design and workflow analysis of primary care at Yale and in the Delaware Valley primary care practices
- Balance of our work through February 2010 will focus on increasing and evaluating utilization of the CDS applications
- Promoting voluntary use appears to be the most challenging aspect of this project

Accomplishments

Nemours Asthma Implementation

- Roll-out activities for the Nemours Asthma CDS SmartForms are now complete
- Forms are functioning and performing correctly in production, but we are seeing low utilization
 - Missing clinical champions “on the ground” in each clinical location (following recent Nemours organizational changes)
 - Uses SmartForm in EpicCare – more complex and time-consuming to use
- We are working with Nemours to recapture clinical attention and boost adoption after the summer vacation period.

Nemours Obesity Implementation

- Roll-out activities for the Obesity CDS are now complete
- We are beginning to see usage but plan to work to improve adoption in September
- Uses SmartText in EpicCare - more intuitive/simpler to select and launch
- Beginning to receive requests for enhancements – evidence of usage and commitment to make the CDS work well for the clinical community

Accomplishments

Yale Obesity Implementation

- Obesity CDS is now in use at the Primary Care clinic
- Every clinician seeing a child age 2 and older for a health maintenance visit has the nutrition and activity decision support automatically inserted into the documentation stack

Evaluation

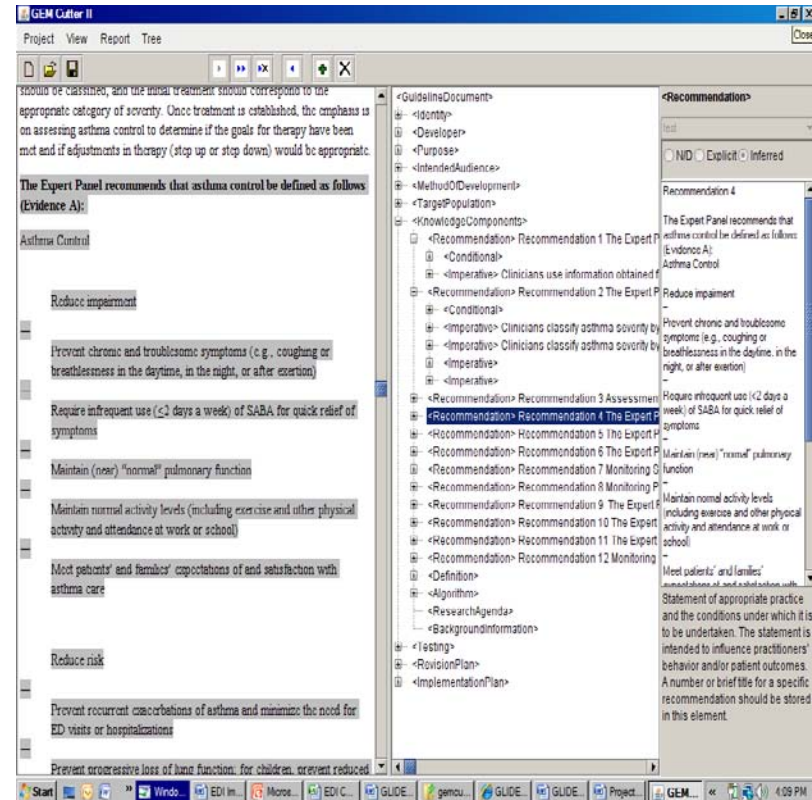
- Qualitative evaluation and thematic categorization is underway
- Preparing a detailed discrepancy analysis which analyses differences between clinician decisions and the CDS recommendations
- Detailed review and comparison of the both the Yale and Nemours Obesity CDS designs in September

Phase III Planning

- Asthma CDS at Nemours Primary Care clinics in Delaware Valley will require minor changes to the CDS design prepared for Phase II (pending assessment of Phase use)
- Asthma CDS at Primary Care clinics at Yale (New Haven) will require design changes and more significant changes to workflow

Technical Challenges - GEM

- Multi-Platform Operation
 - MAC – PC transfer
 - Consistent handling of Unicode characters
- Embedded Graphics
- Guideline Versions
- Guideline Quality
 - Implementability
 - Missing details
- Use of controlled vocabulary



Extractor Overview

- Provides users with the ability to view XML formatted guideline knowledge using structured, extensible stylesheet transformations (XSLT)
- XSLT, which uses XPATH as a query language, enables
 - Flexible access to the content of elements of a GEM document
 - Flexible reporting and presentation of guideline knowledge components
- Extractor is Java web application built using the Struts 2.0 Web Framework
- GEM Documents are uploaded to an Apache Tomcat web server via a web interface that allows users to select the format of the generated report
- The uploaded file is transformed to HTML using a Xalan XSLT processor and formatted via an XSL stylesheet to meet view criteria specified in the request
- Various views of the data are available
 - Recommendations
 - Imperative and conditional statements (IF...THEN ...ELSE rules)
 - Knowledge Components
 - Decision Variables
 - Actions and Directives
 - GEM-COGS, GEM-Arden

Technical Challenges - Centricity

- User Interface (UI) Design
- Access to Data
- Time Stamping

Columns must be created one cell at a time

Use of uneven grids or cell layout require special programming logic

Old-fashioned look and feel to UI controls such as check-boxes and navigation buttons

Old-fashioned look and feel to UI controls such as check-boxes and navigation buttons

Adding highlights and emphasis does not always produce attractive results

Obesity Risk Factors

Maternal Smoking During Pregnancy 1.7

Nutrition/Activity Assessment

RECOMMENDATION	Current	Details	Goal
>= 5 servings fruit & veg most days	<input checked="" type="radio"/> Y <input type="radio"/> N		
Adequate Ca & vitamin D	<input type="radio"/> Y <input type="radio"/> N		
Low-fat milk	<input type="radio"/> Y <input type="radio"/> N		
<= 1/2 cup 100% juice per day	<input type="radio"/> Y <input type="radio"/> N		
No regular sugar sweetened beverages	<input type="radio"/> Y <input type="radio"/> N		

Technical Challenges - EpicCare

- Asthma vs. Obesity CDS Usability
- SmartForms vs. SmartText
- Locating Database Fields That Store CDS Actions
- Prioritizing Enhancements To The CDS

Questions For The TEP

- How to design clinical workflow so that CDS is triggered for specific patient encounters, especially for multi-problem patients?
- How is guidance best prioritized for patients with multiple problems?
- Under what circumstances should mandatory requirements be imposed on clinicians?
- How are regulatory edicts (e.g., recording of pain scores for all patients, including 1 year old children presenting for health maintenance, TB risk factor screening on all patients) most effectively integrated (or resisted)?
- What practices are most effective in improving use of the EHR at the point of care for clinicians who believe that the computer interferes with the clinician-patient relationship?

Next Steps

Phase II Implementation

- Continue to work to improve utilization at all sites

Phase III Implementation

- Commence Phase II design and delivery (Asthma at Nemours Delaware Primary Care, Asthma at Yale Primary Care).

Evaluation

- Continue formal Phase I Evaluation data gathering and quantitative/qualitative evaluation activity
- Complete compilation of “lessons learned” and draft CDS design and implementation-related papers
- Commence Phase II Evaluation

CDSC UPDATE

August 19, 2009



Accomplishments Summary

- Focused on development and testing of our service in preparation for implementation in the Partners LMR (scheduled for November 2009)
- Conducted first end-to-end test of 75% of the service components in our own development environment and moved them into QA
- Worked on our option year proposals and began meetings with Regenstrief (second demonstration site)

Accomplishments, cont.

- Conducted site visit to Zynx from 7/28-7/30
- Recorded first demo of CDS best practices from our qualitative assessment featuring Regenstrief
- Completed install of Documentum components with customizations on production servers
- Developed assessment tool for health IT vendors on their KM capabilities
- Finalized clinic selection for demonstration at PHS
- Developed eRoom database to store comments on editorial policies for submitted content
- Completed analysis of actionable DM rules from across the consortium sites

Challenges: KMLA, KTS, CCHIT, CGC

- Vendors are “pushing-back” on answering questions regarding their content and CDS capabilities
- Team lead for KTS left Harvard and moved but will continue to work on the project
- Difficult to create easy-to-use editing tools and manage GELLO’s complex syntax
- Difficult to plan for CCHIT recommendations since we are waiting for ONC’s decision on its future role
- Challenging to make editorial policy decisions within the Content Governance Committee since these must go “up the chain” at the consortium sites

Challenges: KM Portal

- Design and implement metadata constraints associated with all four content specification levels
- Define document relatedness for the evolution of content through multiple specification levels
- Difficult to synchronize enhancements across both the portal and repository, which are independent applications
- The content management system at Partners underwent a major version upgrade, which required redesign of some CDSC capabilities
- Difficult to assess the portal usage patterns without requiring users to log on

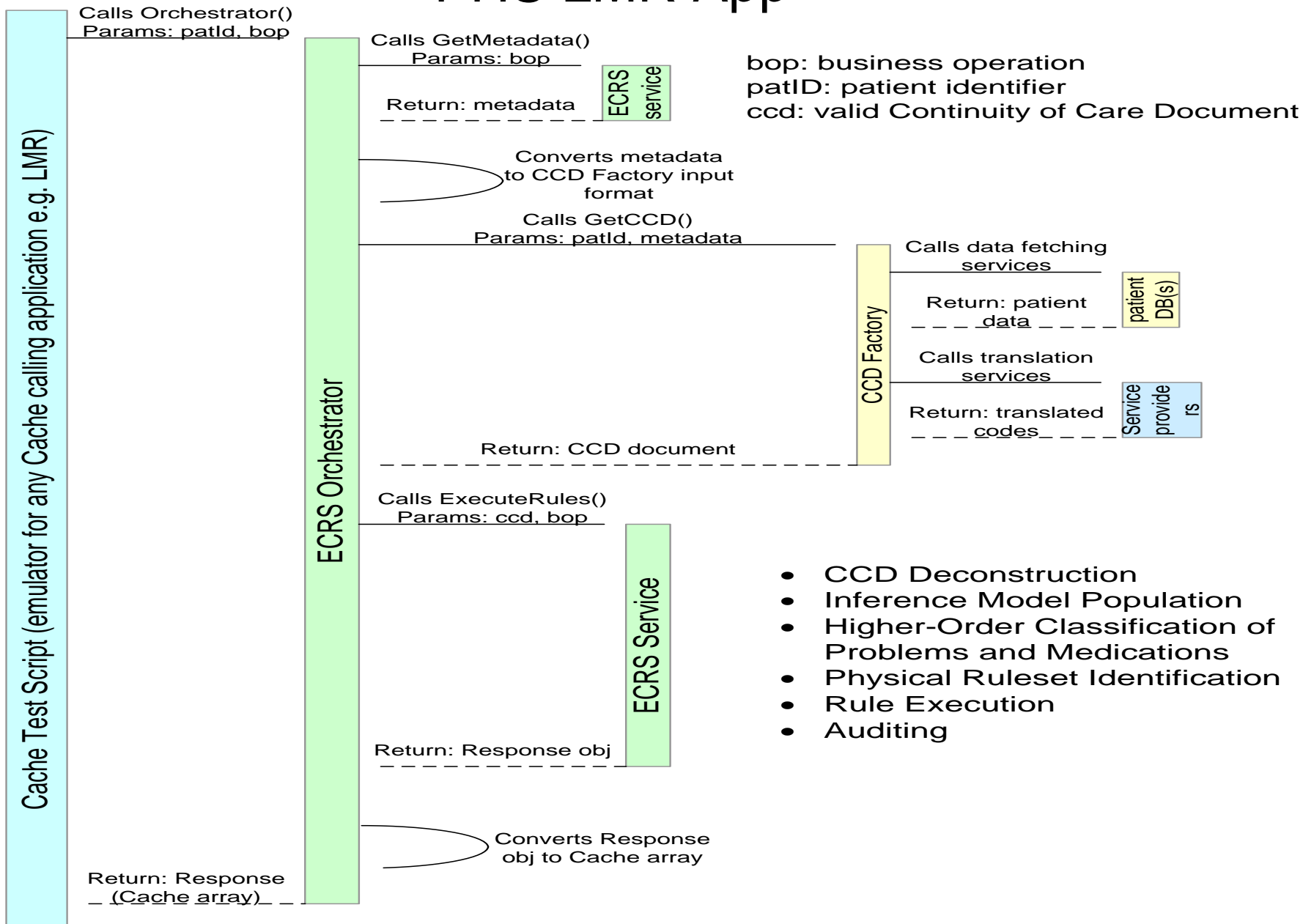
Challenges: Service/Demonstration

- An operations resource is still required to support the decision support service pilot
- Delays in finalizing content selection delays specification development and rule authoring
- Coordinating multiple components required for the decision support solutions presents logistical challenges, given the tight timelines
- Coordinating with all required data sources and mapping local terms to standard codes

Services: Decisions, Decisions . . .

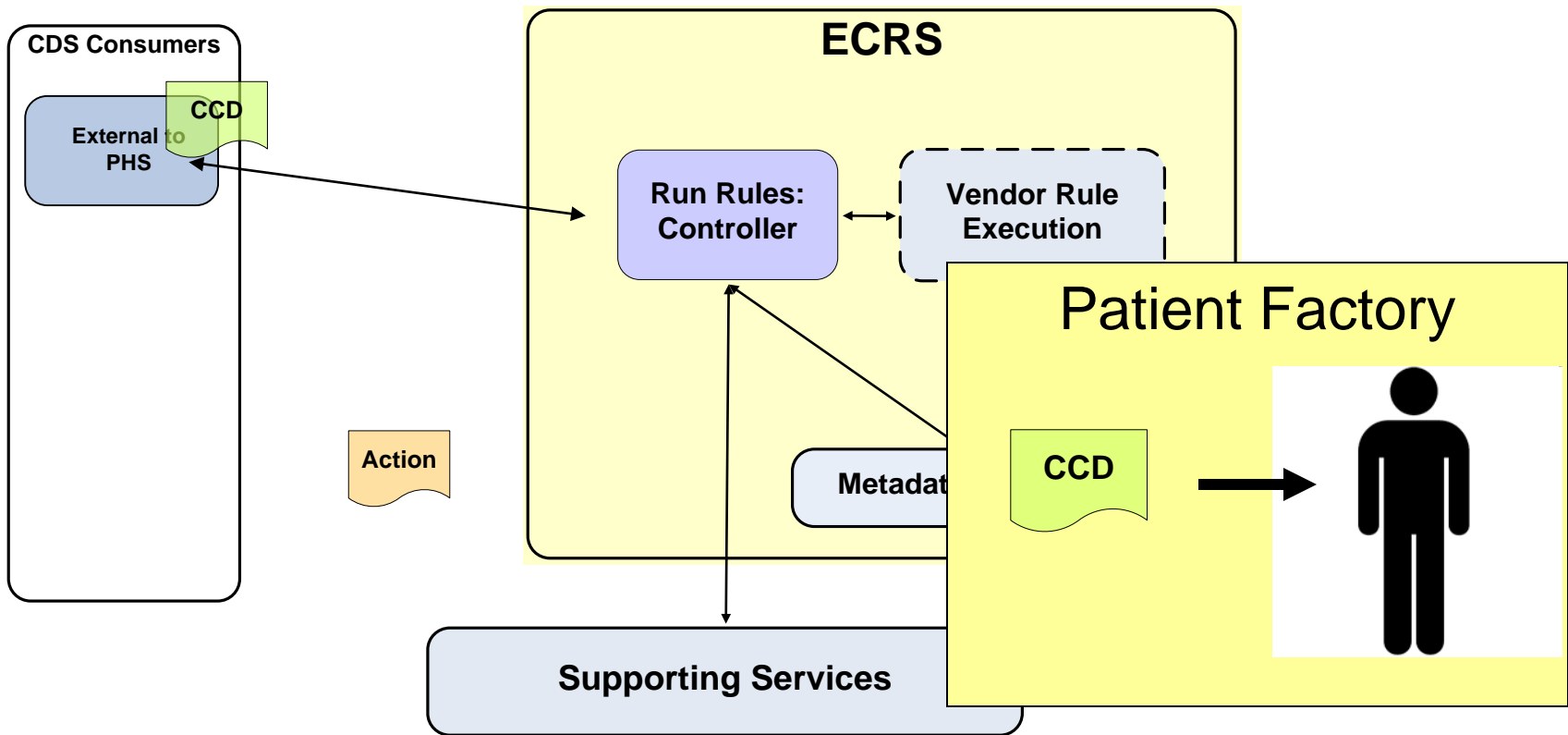
- Actually making a decision is fast and easy
- Preparing the decision
 - Ruleset identification
 - Data inventory
 - Data assembly, translation
 - Inference model assembly
 - Inference model refinement (i.e., higher-order classifications)
- Returning something meaningful
- Informatics + high-performance software engineering

High Level Sequence Diagram for CDSC Pilot in PHS LMR App



- CCD Deconstruction
- Inference Model Population
- Higher-Order Classification of Problems and Medications
- Physical Ruleset Identification
- Rule Execution
- Auditing

Calling ECRS



Patient Information Model

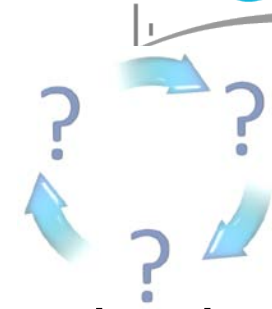
Underscore signifies that the attribute/class is not defined/constrained by HITSP. Some of the classes not defined in HITSP are defined in the CCD document (Organizer and EntryRelationship)

Action Model

Demo: Co-existing



- Clinical governance of existing content vs. new ‘stateless’ content based on research clinics vs. ‘operational’ clinics to avoid overlaps.
- Application layer to capture and maintain mapping data from externalized service for trigger rules.
- Not all content will replicate on GoLive thus strategy on parallel DSS for the short term.
- Dependencies between rules and actions limit how many rules are replicable in an externalized service in the short term.
- Trigger Logic: Pre-generate vs. real-time

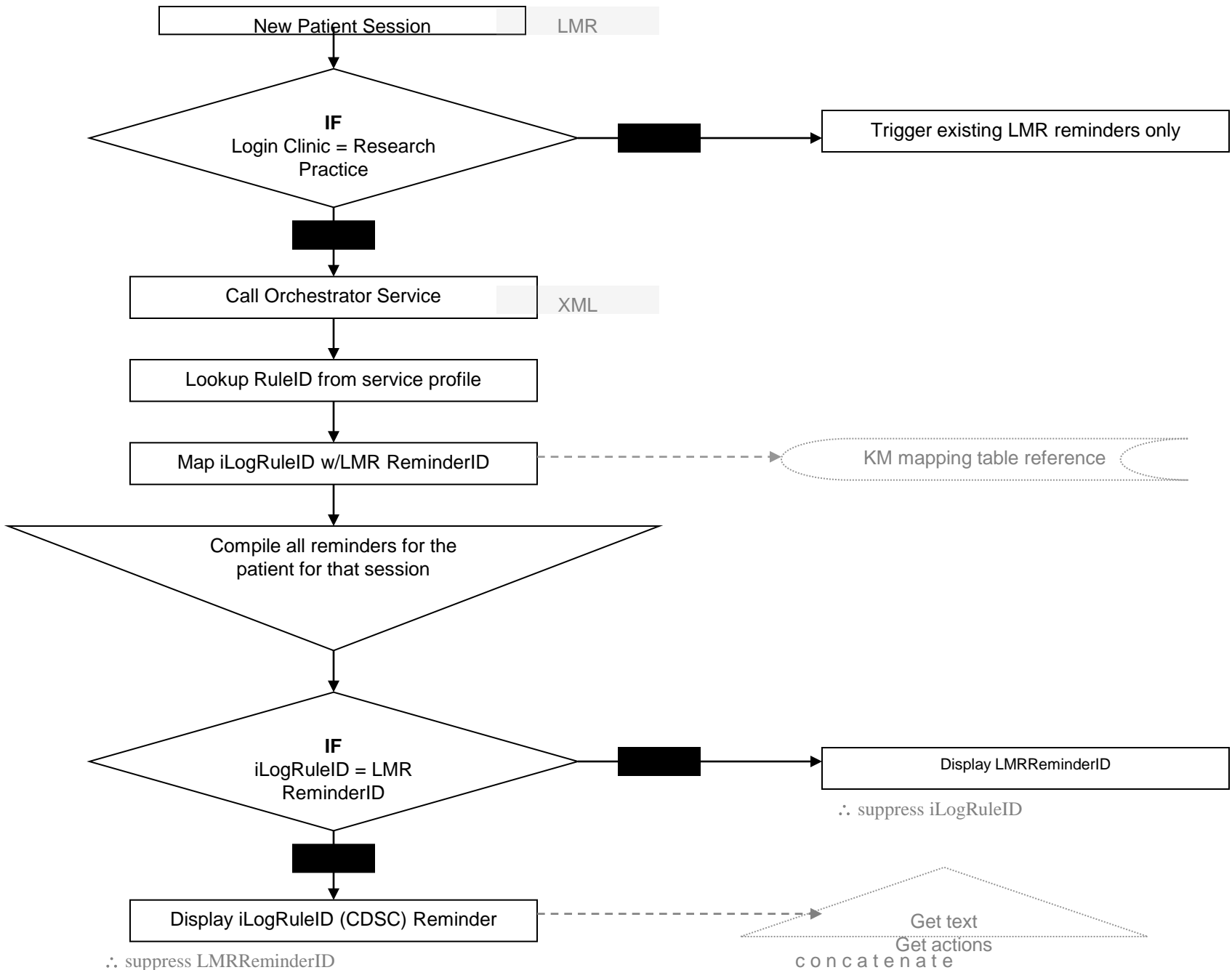


Synchronization

- Middleware (called the ‘Orchestrator’) communication schema is generalized; thus coordinating application layer services is critical
- User defined actions and iterations of snoozing logic
- Error handling: who is capturing what, when and how and communication protocols following it.
- Testing
- Performance
- Reporting: Transaction events distributed across application, middleware & rules engine.

Process Flow Diagram

CDSC ↔ LMR Integration



Reminders in LMR

Test,Zina QL012 3

16174351 (BWH) 01/01/1901 (103 yrs.) F BIMA

Select Desktop Pt Chart: Summary Oncology Custom Reports Admin Sign Results ? Resource Popup

Reminders

- Patient is almost due for Ophtho exam by 09/07/2004 (rec: q 1 year).

- Problems** Add New
- [Asthma](#)
 - [Diabetes mellitus](#)
 - [Obesity](#)
 - [? gonorrhoea](#)
 - [Anxiety](#)
 - [Depression](#)
 - [Adjustment d/o](#)
 - [Depression](#)
 - [Depression](#)
 - [Depression](#)
 - [R/o depression - Minor](#)
 - [Alcohol abuse](#)

- Medications** Add New
- [Advailr DISKUS 100/50 \(FLUTICASONE PROPIOM](#)
 - [Amobarbital 30 MG PO BID x 10 days](#)
 - [Amoxicillin/clav.acid 250/125 \(AMOX./CLAV.ACID](#)
 - [Celexa 20 MG PO 1qd](#)
 - [Celexa 20 MG PO qd](#)
 - [Gty 100 SC uuuu](#)
 - [Penicillamine 250 MG \(250MG TABLET take 1\) PO](#)
 - [Tylenol \(ACETAMINOPHEN\) 325MG TABLET take](#)
 - [Wellbutrin SR \(BUPROPION HCL SUSTAINED REL](#)
 - [Wellbutrin SR \(BUPROPION HCL SUSTAINED REL](#)
 - [Wellbutrin SR \(BUPROPION HCL SUSTAINED REL](#)
 - [Wellbutrin SR \(BUPROPION HCL SUSTAINED REL](#)

Allergies Add New

Flowsheets Add New

Item Name	05/13/2004	04/12/2004	0
BLOOD PRESSURE	130/80	120/80	1
TEMPERATURE		98.6 F	
PULSE			6
RESPIRATORY RATE			1
O2 SAT			
HEIGHT		72 in	
WEIGHT		210 lb	
BMI	28.5	28.5	2

Health Maintenance

HM Item	Date of
Influenza Vaccine	12/17/200
Breast Exam	06/10/200
Rectal exam	06/10/200
M-alb/creat ratio	

Notes Add New

Date	Subject	
08/01/2004	Patient Note	James f
07/27/2004	Patient Note	James f
07/27/2004	Note	James f
07/26/2004	Patient Note	James f

Sticky Notes Add New

Patient E-mail

idxtest@aol.com

Pharmacies Add New

Questions for TEP

- Advice for dealing with push-back from vendors when we ask about their decision support capabilities
- How to plan for CCHIT recommendations while waiting for ONC's decision on future of CCHIT and other certification organizations
- How to make editorial policy decisions with the participants (decisions need to go “up the chain”)
- Suggestions for Option years 3 to 5

Next Steps

- Visit another clinical content vendor (First Data Bank)
- Continue evaluation of model using GLIA
- Develop and test portal function
- Conduct interviews with health IT vendors on their KM capabilities
- Continue to write and test AHRQ/CDSC rules in QA
- Continue analysis of LMR Reminder data, and how to get it into QDW each month
- Review CAD and HTN rules from consortium sites

Recap