## Call Agenda

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Topic</th>
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<tbody>
<tr>
<td>3:00 - 3:02</td>
<td>Roll Call, Michelle Lenox (MITRE)</td>
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<td>3:02 - 3:05</td>
<td>Review of the Agenda, Maria Michaels (CDC)</td>
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<td>3:05 - 3:50</td>
<td>Sharing Lessons Learned with CDS: Stewardship of Implemented, Interoperable &amp; Shareable CDS Artifacts: Lessons Learned and Future Directions (RTI International, MD Partners and Alphora Inc.)</td>
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<tr>
<td>3:50 - 3:55</td>
<td>What's New with CDS Connect This Month (MITRE)</td>
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<td>3:55 - 4:00</td>
<td>Open Discussion and Close Out, Maria Michaels (CDC)</td>
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<td>Open discussion and announcements</td>
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<td>Concluding comments, review next steps and adjourn</td>
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Objectives

• Sharing lessons learned for use of CDS Connect
  ► Versioning discussion illustrated with a WG member use case
• Share new features and resources available for CDS Connect
• Discuss topics of interest to members relating to opportunities for CDS Connect
Stewardship of Implemented Interoperable & Shareable CDS Artifacts: Lessons Learned and Future Directions

Laura Haak Marcial, PhD – RTI International
Joshua E. Richardson, PhD, MS, MLIS – RTI International
Robert McClure, MD – MD Partners
Rob Reynolds – Alphora, Inc.
Agenda

- CDS4CPM Project Background – Joshua Richardson
- Stewardship Challenges and Recommendations – Laura Marcial
- Stewardship Perspectives – Rob McClure and Rob Reynolds
- Open Discussion
Questions We’ve Been Asking Ourselves

• What is the current thinking on conformance to or divergence from CDS Connect artifacts (e.g., “forking” and “breaking the fork”)?
• From a development perspective, what rules, tools, or resources would be helpful to efficiently and economically steward implemented CDS artifacts?
• In a future ecosystem, how is this stewardship managed, especially to foster trust in CDS artifacts?
• Based on prior experience with “open source” tools, or other CDS artifacts to date, what models (e.g., business or otherwise) would best sustain effective stewardship?
Aim to Use CDS that Promotes Shared Decision-Making (SDM) for Chronic Pain Management

MyPAIN for Chronic Pain
- PROM based Pain Assessment
- Non-Opioid Treatment Options
- Information on Opioids
- Pre-visit assessment Questionnaire

PainManager Dashboard
- Results from MyPAIN to facilitate SDM
- Pertinent Patient History
- Historical Treatments and Risk conditions
- PDMP data
- Structure note Generation for SDM

A. Communicate
- Seek your patient’s participation

B. Educate
- Provide details on treatment options

C. Preferences
- Collect your patient’s values and preferences

D. Discuss and Decide
- Discuss options and decide with your patient

E. Evaluate
- Evaluate your patient’s decision
Overall System Architecture

1. TRIGGER
   Patient visit is scheduled

2. phenotype

3. Generates message
   Patient Portal

4. Receiving message
   Patient receives an email invitation to access MyPAIN
   Patient accesses SDM resources via MyPAIN
   Patient records PROs via MyPAIN to prepare for SDM

5. Clinician Invokes PainManager

6. Results of SDM are saved to EHR
   Patient and clinician meet to engage in SDM encounter and decide on a treatment plan
   Clinician/health system collects and reviews data on decision(s) via PainManager
EHR Interactivity Achieved via a “FHIR Façade”

1. EHR Portal Invitation
2. Web Browsers
3. FHIR Facade
4. PDMP
MyPAIN for Capturing Patient Data

We’d like to ask you a few questions about your pain and how it affects you. Please describe how much pain you’ve had in the past 7 days.

Thinking about your overall pain, in the past 7 days, please respond to the questions below:

About my Goals

We’d like to know more about you and your activity goals (for example, I’d like to be able to walk without pain). Please describe, in your own words, your most important activity goals.

What are your most important activity goals?

Your most important activity goals...

MyPAIN
PainManager for Displaying Patient-reported and EHR Data

The information below was provided by the patient on XX/XX/XXXX using the MyPAIN application:

**ACTIVITY GOALS**
I want to be able to walk to my mailbox free of pain. I’d like to get back to enjoying a walk in the neighborhood with my grandkids.

**PAIN LOCATIONS**

<table>
<thead>
<tr>
<th>Location</th>
<th>Pain Y/N</th>
<th>Type</th>
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</thead>
<tbody>
<tr>
<td>Head</td>
<td>Y</td>
<td>burning</td>
</tr>
<tr>
<td>Neck</td>
<td>Y</td>
<td>burning</td>
</tr>
<tr>
<td>Shoulders</td>
<td>Y</td>
<td>aching</td>
</tr>
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</table>

**ACTIVITY BARRIERS**
On a bad day, I have trouble putting on my clothes or getting a shower. I need to take care of my cat but have trouble just taking care of myself some days.

**PAIN INTENSITY AND INTERFERENCE**

<table>
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<tr>
<th>Question</th>
<th>Response</th>
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<tr>
<td>How intense was your pain at its worst?</td>
<td>Somewhat</td>
</tr>
<tr>
<td>How intense was your average pain?</td>
<td>Somewhat</td>
</tr>
<tr>
<td>What is your level of pain right now?</td>
<td>Somewhat</td>
</tr>
</tbody>
</table>
Stewardship Challenges and Recommendations
Who “Owns” the Changes that Result from Implementing Existing Artifacts?

Soft Fork = backwards compatible

Hard Fork = NOT backwards compatible
How Does GitHub Handle “Forking”?

- Issue creation
- Issue discussion
- Merge action
- Release discussion
- Project creation
- Branch creation
- Pull request discussion
- New release
- Pull Request
- Project's fork

**Project**: Contains the source code of a software application

**Issue**: Change request (bug or improvement) for an application

**Commit**: Set of changes of the source code of an application

**Branch**: Set of commits usually addressing an application's feature

**Fork**: Creation of a new branch

**Pull Request**: Request to join two branches

**Merge**: Action of joining two branches

**Release**: Publication of a new version of an application
SDLC and Stewardship Implications

- Planning
- Analysis
- Design
- Implementation
- Testing & Integration
- Maintenance

Implementation level
- Addressed in implementation phases
- TBD

Source level
- Addressed in design phases
- CDS Connect
Example 1:  
Stewardship for cloud-based artifacts

**Goal:** To develop and launch a cloud-based app for project sites to pilot during a 4-month period

**Challenges:**

- Communicating with the EHR vendor the underlying purpose of the artifact and that it’s for non-profit research purposes
- Determining who (e.g., developer, site or other) and how a unique identifier for the application gets assigned by the vendor. Determining the role and responsibilities for whichever party is the official client

**Solution:** Proceed with a site-based rather than a cloud-based approach
Example 2: Stewardship for linked terminologies and/or value sets

**Goal:** To either use existing artifact vocabularies or create locally based codes to meet the needs of our artifact

**Challenges:**
- Determining the party to be listed as VSAC’s steward of record
- Determining and documenting the handoff of stewardship

**Solution:** In progress, likely assign temporary stewardship to one project organization on an interim basis
Example 3:
Sustainable stewardship beyond the project period

Goal: To promote long-term use of the artifact at the project sites

Challenges:
- Determining the steward of the artifact after the project ends (e.g., each site, third party or other)
- Defining site plans for using the artifact after the project OR decommissioning the artifact
- Determining services and costs to support stewardship beyond the project period

Solution: Stewardship is currently assigned to the developer (Alphora) for the project period
Stewardship Challenges

- CDS Connect is a repository of candidate artifacts and has guidelines for deposit but these guidelines do not typically extend to implementation.
- Differing models exist on how to manage integration on the vendor side.
- There is a need to anticipate any security and risk assessment concerns, like regular and robust vulnerability scans for cloud-based solutions, implementing organizations might have.
- Underlying value sets, uses of terminologies and implementations of clinical practice guidelines are all good examples of items which will require some ongoing maintenance for these artifacts some of which are managed at the repository level but many of which will be customized on implementation.
- Each implementing site may face issues associated with both pulling and posting data via API when implementing these artifacts.
• Research initiatives are typically funded for a time-limited period and there is often no plan or funding to perpetually maintain/steward knowledge artifacts after funding
• In a cloud-based and open-source model, need to create space for a role with appropriate costs and fees
• This issue of stewardship is part of a bigger issue about knowledge management at the health system level
• There may be real liability concerns that make this issue critical to address in the short term, such as a change to a guideline or recommendation that is implemented as CQL logic in some form which does not get or manually updated based on that change
• This stewardship role is especially important while EHR vendor support of APIs is limited but may be less necessary once these barriers are resolved
Stewardship Recommendations

• It could be useful to develop an approach to stewardship that focuses on “levels” with a “source-level” steward for an artifact that is meant to be shared broadly and an “implementation-level” steward for a version that is implemented in a particular site
• CDS Connect does have a designation for an artifact that is intended for research only and not for implementation in patient care (e.g., may not be updated) and this can be modified should an artifact be brought into the clinical setting
• Funding agencies should focus on supporting the long-term maintenance of useful and usable artifacts
• Current EHR vendor business models generally presume a for-profit approach which may not always be the case. For more ‘public good’ or research-oriented implementations, it would be good to encourage vendors or other offerors of CDS artifacts to develop pricing structures and use agreements that addresses this type of use.
Guidelines for implementation and maintenance of shareable CDS artifacts could enhance the conceptual role of stewardship and support ongoing research activities of this type.

These guidelines should:

- Include specific guidance on management of underlying value sets, uses of terminologies and implementations of clinical practice guidelines.
- Lay out and incorporate lessons learned on various implementation options (e.g., locally installed and hosted versus cloud hosted).
- Address concerns about liability, perhaps with the use of no-liability type licenses, associated with instantiated artifacts.
- Provide guidance on implementing these artifacts, including challenges and solutions to both pull and post data should be included.
- Proactively address specific security standards.
• For a steward offering cloud-based access to executable CDS artifacts, secure access would need to be part of the steward’s responsibilities.

• Some practices simply don’t have the information or knowledge management capabilities needed to support stewardship and will find these services valuable if cost effective.

• Best practices around knowledge management including details around acquiring, implementing, tracking, evaluating, and maintaining knowledge artifacts should be considered as potentially core responsibilities of the steward.

• Explore how the stewardship role might evolve as EHR vendors improved their support of APIs.
Other Perspectives on Stewardship
Conclusions

• Stewardship is a means to sustain knowledge artifacts for the entire life of a given artifact
• Stewardship needs occur in different phases and at different levels throughout the project lifecycle
• How stewardship is viewed and managed by EHR vendors needs to be better understood or articulated
• Self-sustaining business models that support long term maintenance of knowledge artifacts is needed to complement the implementation of shareable artifacts
Contact Us

• Joshua Richardson, RTI International – jrichardson@rti.org

• Laura Marcial – lmarcial@rti.org

• Robert McClure, MD Partners – rmcclure@mdpartners.com

• Rob Reynolds, Alphora – rob@alphora.com
WHAT’S NEW WITH CDS CONNECT

David Winters and Chris Moesel, MITRE
Updates and New Features

- **Authoring Tool**
  - External CQL libraries can now be updated in place
  - Updated AHRQ header and footer
  - CPG on FHIR Library export (in progress)
  - External CQL Function support (in progress)
  - Bug fixes and usability improvements

- **Repository**
  - Updated AHRQ header and footer
  - New user sign-up form, landing page, and toolbar
  - Updated FAQ entry on review and update process
  - CDS Connect video
  - CPG on FHIR work continues
  - Security patches and bug fixes

- **Link to CDS Connect**: [https://cds.ahrq.gov/cdsconnect](https://cds.ahrq.gov/cdsconnect)
ANNOUNCEMENTS, OPEN DISCUSSION AND CLOSE-OUT

Maria Michaels
Office of Public Health Scientific Services
Centers for Disease Control and Prevention