Opportunities for Priority Action to Improve CDS Interoperability and Usability to Reduce Clinician Burden

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White Paper

A Roadmap for National Action on Clinical Decision Support

Figure 1. The three pillars for realizing the promise of CDS.
## Grand challenges in clinical decision support

<table>
<thead>
<tr>
<th>Grand challenge description</th>
<th>Mean ranking</th>
<th>Standard deviation</th>
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<tbody>
<tr>
<td>Improve the human–computer interface</td>
<td>2.89</td>
<td>2.71</td>
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<tr>
<td>Disseminate best practices in CDS design, development, and implementation</td>
<td>3.33</td>
<td>1.87</td>
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<tr>
<td>Summarize patient-level information</td>
<td>3.67</td>
<td>2.06</td>
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<td>Prioritize and filter recommendations to the user</td>
<td>4.56</td>
<td>2.96</td>
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<tr>
<td>Create an architecture for sharing executable CDS modules and services</td>
<td>5.44</td>
<td>2.30</td>
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<tr>
<td>Combine recommendations for patients with co-morbidities</td>
<td>5.89</td>
<td>2.20</td>
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<tr>
<td>Prioritize CDS content development and implementation</td>
<td>6.00</td>
<td>2.96</td>
</tr>
<tr>
<td>Create internet-accessible clinical decision support repositories</td>
<td>6.89</td>
<td>1.69</td>
</tr>
<tr>
<td>Use freetext information to drive clinical decision support</td>
<td>7.89</td>
<td>1.27</td>
</tr>
<tr>
<td>Mine large clinical databases to create new CDS</td>
<td>8.44</td>
<td>3.00</td>
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</tbody>
</table>
CDS Consortium Demonstrations: 2008-13

Toward a National Knowledge Sharing Service

Major accomplishments:

- Knowledge artifacts published: 11 clinical rules, 50+ classification rules and 375 immunization schedule rules
- 8 clinical sites implemented using 5 different EHRs
- More than 240 users utilize CDS services
- Established legal framework for collaboration
- Since 2010 more than 1.7M CCD transactions were processed
- 31 entities (companies and academics) in a pre-competitive environment
- Contributed to ONC-sponsored Health-e-Decisions efforts: KAS 1 and KAS 2
CDS
“Unified Approach”

Kawamoto K, Middleton B, Reider J, Rosendale D, Schiffman R.
From Guidelines to Clinical Decision Support: a Unified Approach to Translating and Implementing Knowledge
AMIA Panel Presentation, Chicago, IL 2012

“CDSC” = CDS Consortium
EHR - API Ecosystem

K.D. Mandl, J.C. Mandel, I.S. Kohane,
CDS Marketplace Current State

CDS Resource
Sharing and Use

Discern Health
Recommendations
to Office Clinical
Quality and Safety,
ONC, 2015
CDS Market Preferred State

Supply

Generation

Translation

Exchange

Demand

Integration

Use

Feedback

Standards and automation to support efficient translation

Competition increases benefits and lowers cost

Awareness of benefits, lower cost, and trust stimulate demand

Feedback contributes to a continuously learning system

Multiple options for users to buy

Standards and automation make customization and maintenance less costly
We need a new approach and capabilities to distribute and operationalize computable clinical guidelines as CDS and monitor its effectiveness.

1. Build eCQMs & computable eGuidelines on PaaS
2. Support continuous improvement of Guidelines
3. Enable automatic eGuideline surveillance
4. Leverage real-time analytics to power CDS at point of care through desired engagement layer (e.g., EHR, SMART on FHIR, BI, others)

The Vision: CDS for ‘best care everywhere’
A System of Insight
The platform to implement a next generation architecture

Apervita is positioned to support HCOs and business networks at scale: supporting and providing leadership in the vision, design, and deployment of advanced applications and analytics across the healthcare industry.
Methodology and Application Overview

L1: Started with paper CDS STI Guideline
L2: Converted Guideline to a logic flow diagram
L3: Built standards-compliant CQL and FHIR Resources
L4: Implemented real-time CDS on Apervita

SMART on FHIR

Elimu Sapphire

Implementation and Application Overview

Analytics Engine

EHRs

SMART on FHIR Apps

Apervita

Population Health

SCM

Finance

HR

Strategic Reporting

APIs

APIs

EHR
Shared Nationwide Interoperability Roadmap: The Journey to Better Health and Care

Dramatically reduce the time it takes for evidence from research to become common practice (thus better evidence-based diagnosis, treatment and personalized medicine).

By the end of 2024

A Learning Health System reduces the time from evidence to practice. This enables ubiquitous connectivity, improves population health and helps researchers analyze data from a variety of sources.

Sources:
1. ONC Report to Congress, October 2014
   http://www.healthit.gov/sites/default/files/d_adopt_need_exchange9022014.pdf

http://bit.ly/2hYDJSJ
Thank You!

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