

Standardization of Clinical Decision Support: An Essential Strategy for Interoperability and Optimization of Patient and Provider Experience

Session Number: S15



Disclosure



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- Michael A. Grasso, MD, PhD, Chair Elect 2018
- **Eleanor Barone, MD, Vice Chair 2018**
- Joshua Richardson, PhD, Member-At-Large

Learning Objectives

After participating in this session the learner should be better able to:

- Recognize the key role that standardizing CDS plays in optimizing patient care and reducing clinician cognitive burden.
- Identify successful strategies to standardize the representation of clinical statements and integrating the terminologies we use to populate those clinical statements and their importance to achieving interoperable CDS

Case Example:

Aligning the Department of Defense (DoD) and the Department of Veterans Affairs (VA) Clinical Decision Support (CDS) in Perioperative Processes, Reducing Cognitive Burden

Eleanor Barone, MD

ACOS Informatics, Fayetteville NC VA Medical Center

Has The Promise of Health IT Been Delivered?

- ✓ Improve the quality and safety of healthcare
- ❓ Measure the cost and outcome of provided services
- ✗ Integrate multiple providers across organizations in a continuum of care
- ✗ Integrate high-quality decision support into the clinical workflows in the continuum of care.

***Encoded data is the foundation
needed to deliver the promise!***

Five Rights of CDS

I would respectfully submit that delivering the promise of HIT must encompass outcomes in the quality, and to do that there must be a return to basic precepts:

- The right information
- To the right person
- In the right intervention format
- Through the right channel
- At the right time in the workflow

Aligning DoD and VA CDS....

CDS is a process “providing clinicians or patients with computer-generated knowledge and patient-related information, intelligently filtered or presented at appropriate times, to enhance patient care.” (Osheroff, et al)

Current CDS in VA electronic health record (EHR) CPRS: Computer Provider Order Entry (CPOE), order sets, templates, and Clinical Reminders

“The Clinical Reminder system helps caregivers deliver higher quality care to patients for both preventive health care and management of chronic conditions, and helps ensure that timely clinical interventions are initiated.” (VistA Clinical Reminders version 2.0 Clinician Guide)

Why Do Clinical Reminders Matter in Day Surgery?

Three (3) types of measures:

- Structural (organizational structure, policies, activities)
- Process measures (practical, diagnostic, procedural of health care providers)
- Outcomes (the effect on patient, morbidity, mortality, loss)

Healthcare Effectiveness Data and Information Set (HEDIS), measured by the National Committee for Quality Assurance (NCQA), and the Joint Commission (TJC) using ORYX measures (a light agile gazelle like creature)

Seek to measure quality of health care on these performance, structural, and (very rarely) outcomes measures...however, surgical patients and their caregivers rate their surgery very much by outcomes....

Why Do Clinical Reminders Matter in Day Surgery?

Healthcare facilities pay EPRP to come in and prepare them for evaluations by TJC.

Leadership and consumers demand to know why we do not meet our HEDIS and ORYX measures.

We must “teach to the Test.”

Providers complain some about order sets, CPOE, and maybe there are too many alerts, but these quality metrics represent a huge cognitive burden with little or no demonstrated outcomes value to the provider and his or her patient.

Summary

The literature speaks of processes, which are disproportionately given weight in all scenarios as markers of quality.

We are very aware of cognitive burden, alert fatigue, and the disappointing lack of improvement overall in healthcare with respect to cost, lifespan, morbidity, mortality, maternal mortality, infant mortality, and so on.

Is all of the CDS, especially the quality metrics, relevant to each MD in each case, at the right time, making it easier to ‘do the right thing?’

The Cost of Quality

There are upwards of 6,000 quality measures in health care today, costing the health system an estimated \$15.4 billion annually in physician reporting...(there are) no standardized defined set of measures or primary data sets that identify the quality of an individual clinician or a facility. The significant increase in quality measures speaks to the growth of quality improvement efforts over the past decade. Despite these efforts, the health outcomes and quality of care associated with these many quality measures has not improved nearly at the same rate of increase as the resources pumped into the system to develop, collect, and report metrics. Medical errors remains the third-leading cause of death in the United States...

- Alina M. Czekai, MPH, *Transforming Health Care Quality Measurement and Reporting*, American Health Policy Institute, 2017

Creating Clinical Content for Standardized CDS: Garnering Institutional Support and Coordinating Communication among Clinical and Technical Staff

Diane Montella, MD

Physician Informatician, Veterans Health Administration

Making the Case for Shareable CDS: Planning for Beneficial Use of CDS in a Changing Landscape

Access to Care

Next Generation EHR

- Timely access to pertinent patient data
- Deliver Coordinated care across institutions
- Establish standards-based enterprise data
- Carry forward best VA clinical decision support
- Rapidly adopt emerging clinical best-practices

Health Platform



**Empowering the
Best Care
Everywhere**

Clinical Decision Support *Best Practices to the Point of Care*

Vet a process to create standards-based, sharable clinical content

Empower the field to effectively evaluate CDS

- KNART: HL7 Compliant Knowledge Artifact
- Created standards-based clinical content -- order sets, rules, and documentation templates -- for artifacts that can be implemented in modernized VA systems and promote VA's ability to share data with DOD and external healthcare partners
- High volume, fast-paced 15-month effort leveraging:
 - Contract award(s), and
 - Dedicated investment of significant VA human resources including informaticians and multi-disciplinary clinical subject matter experts, and
 - Collaborative efforts of KBS teams – CDS, Terminology, Informatics Architecture, Standards
 - Collaboration with Federal Partners – DOD, AHRQ

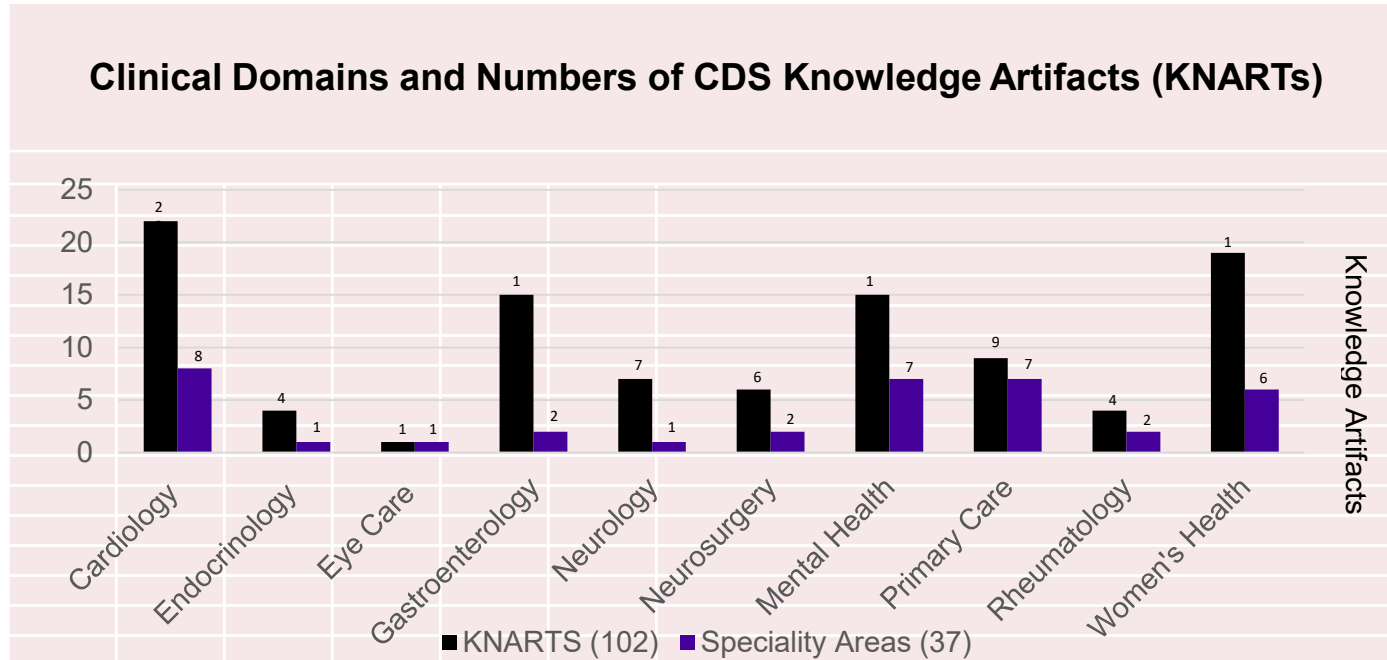
Garnering Institutional Support: Align Project or Program Goals to Institutional Priorities

- Align your priorities with your organization's priorities
 - Encourages ongoing support, e.g., resources, good faith, ongoing public endorsement.
 - Institutional “memory”: can be short; changes for convenience (but not yours); and changes with little warning for reasons that may have nothing to do with you and for reasons you may never know.
 - Aligning priorities may shield your work from unanticipated ‘changes’ by creating a bond between your goal(s) and the resources of your institution or organization
- Strategy: map your short-term project / goal(s) to your institutions long-term goal(s) and strategic plan. If you can also map your project goals to your institutional 'hot topics', all the better.

VA CDS KNART Project: Align Project Goals to Institutional Priorities

- Lofty Project Goal - Shareable CDS:
 - Standards based
 - Relevant
 - Reusable (preservation of meaning)
 - Effective (measurable)
 - Not harmful (harms known, minimize harms)
- We aligned project goals with VA clinical and operational priorities in the selection of CDS KNARTs. Examples:
 - Curtailing opioid use in management of chronic non-cancer pain - also 'hot topic'
 - Suicide Risk Assessment
 - Screening for Mild Traumatic Brain Injury

VA CDS KNARTs: The Selection



Align goal(s) with your institution's priorities but position yourself to get to your project finish line

Some generic points:

- In so far as it is possible, cast a wide net for early buy in, but...
- Define your plan narrowly (enough to get the job done; promise only what you can actually accomplish), with a clearly defined beginning and end, and...
- Don't vary without a really good reason, and then only using a pre-defined plan to accommodate variance (manage expectations, mitigate scope creep).

Clinical and Technical Team Communication in creation of clinical content for standardized CDS

It is easy to think of “technical requirements” and “technical solutions” in a silo, separate from "clinical requirements" and "clinical solutions".

Our efforts toward the creation of standardized CDS have been a window into understanding that clinical and technical requirements and solutions are interdependent on the road to interoperability and making CDS shareable.

Finding and maintaining a “common language” between technically oriented staff and clinically oriented staff is essential. This takes deliberate, patient effort.

A “Tool” for Clinical and Technical Team Communication: Construct a CDS Project Plan

Construct a Formal CDS Project Plan -

- Define these points with all stakeholders at start of your CDS project:
 - Define what constitutes success
 - What defines the project end points. When is a KNART, or content for a KNART, ‘finished’?
- Vet the CDS project plan with both clinical and technical staff. Then follow the plan (regular check-ins; manage expectations).
- Project Planning is a “thing” - use people who know how to do it well.
- Make sure that all parties are comfortable with the tools you choose to use, and can actually use them
- Have a plan for accommodating and facilitating participation of busy staff.

Practical Challenges in Identifying, Documenting, and Validating Clinical Content for Standardized CDS

Linda Wedemeyer, MD, RN, MS

Physician Informatician, Veterans Health Administration



Identifying Clinical Content

Intent

- Leverage best VistA CDS for future VA systems
- Leverage VA/DoD Clinical Practice Guidelines
- Support Veterans Health Administration Priorities

Clinical Domains

- Cardiology
- Endocrinology
- Eye Care
- GI
- Mental Health
- Neurology
- Neurosurgery
- Primary Care
- Rheumatology
- Women's Health

Department of Defense (DoD) Note Templates

- Adoption
 - Large numbers of templates
 - Widely used
- Design
 - Some templates are based on VA/DoD clinical practice guidelines
 - Extensive military-wide governance
 - Designed to collect data, but not standardized data
- Collaboration with the Department of Veterans Affairs (VA)
 - VA has deep terminology/modeling/standards expertise to standardize the data output
 - VA and DoD have been meeting biweekly for a year

Practical Challenges

- Subject Matter Experts
 - Many demands on SME time
 - More interest if SMEs choose the knowledge artifacts to work on
- Clinical Leadership
 - Ask national clinical leaders what they are already doing that we can help with, rather than asking them to help us
 - National clinical leadership best poised to bring organizational priorities to the table

Practical Challenges

- HL7 Engagement
 - HL7 KAS (Knowledge Artifact Specification) has many gaps [Draft Standard for Trial Use (DSTU) is now outdated phraseology]
 - Engaged with HL7 in maturing the standard, specifically worked on “composite knowledge artifacts”
- Formal use cases: Early use cases with SMEs would have prevented errors
- Consider diagramming workflow: Early SME engagement with BPMN (Business Process Model and Notation) would have prevented errors

Practical Challenges

- SMEs' final approval was most effective on documents written in natural language.
- Our SMEs were asked to give approval of structured documents, which made feedback on clinical accuracy difficult for them.
- Informaticians should review once structure that supports IT is introduced into the documents.

Note: VA lessons learned may not apply in other settings

2. Medications

[Begin Medications.]

[Technical Note: This section should be available to any provider who is treating a patient with hepatitis C.]

[Technical Note: Subsections in this section should be made available according to the subpopulation criteria identified in the subheadings, based on automated data evaluation and on data entered into the hepatitis C documentation template.]

[Section Prompt: Elbasvir/grazoprevir is contraindicated in patients with decompensated cirrhosis.]

[Section Prompt: Elbasvir/grazoprevir should not be used in combination with 1) strong CYP3A inducers; or 2) OATP1B1/3 inhibitors; or 3) efavirenz.]

[Section Prompt: Providers should check <http://www.hep-druginteractions.org>, <https://www.hepatitis.va.gov/provider/guidelines/hcv-treatment-considerations.asp>, and/or a pharmacist for additional drug interactions or contraindications before starting elbasvir/grazoprevir.]

[Section Prompt: Qualifications for the following treatment include: Genotype 1a, Treatment-Naïve or Treatment-Experienced (PEG/RBV), No NS5A Polymorphisms at Position 28, 30, 31, or 93, without Cirrhosis or with Compensated Cirrhosis (CTP A).]

Elbasvir/grazoprevir (50 mg/100 mg) 1 tablet oral, daily, 28 tablets 2 refills (routine)

Practical Challenges

- Informaticians doing secondary review of clinical content must have all supporting evidence to confirm that clinical intent was correctly represented.
 - Documents that SMEs vetted in natural language
 - Links to guidelines
- If clinicians believe CDS is clinically inaccurate, you have lost them.¹

Note: Lack of resources may be alleviated by commercial companies providing clinical content.

¹Saleem JJ, Militello LG, Arbuckle N, Flanagan M, Haggstrom DA, Linder JA, Doebbeling, BN. Provider Perceptions of Colorectal Cancer Screening Clinical Decision Support at Three Benchmark Institutions. AMIA Symposium Proceedings. 2009;558-562.

DoD/Cerner Lessons Learned

- Formal clinical workflow assessment at the next DoD sites to be implemented
- Twenty-one (21) workflows: known problematic areas at IOC sites

Overall Practical Challenges

Consider, early in your project, end-to-end execution of a single knowledge artifact of a given type to inform similar work that follows.

CDS Connect: <https://cds.ahrq.gov/cdsconnect>

Getting It Right

Essential elements include:

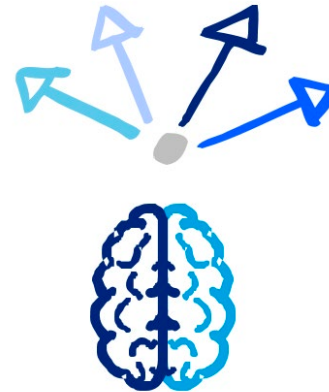
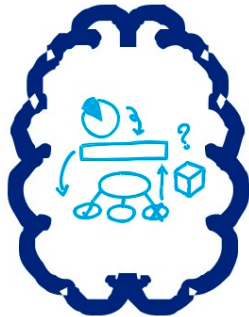
- **An integrated terminology model (SOLOR)**
- **A standardized statement model (ANF)**

Keith E. Campbell, MD, PhD

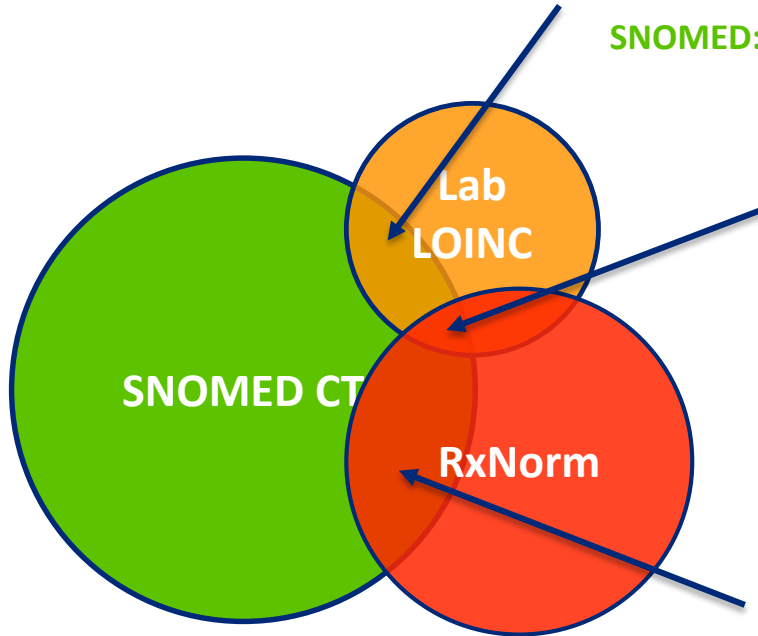
Director of Informatics Architecture, Veterans Health Administration

Cognitive Burden

- Clinician
- Knowledge Engineer
- Developers
- Context Switching



The Overlaps



LOINC: Gentamicin is a component of laboratory tests

SNOMED: Gentamicin is a component of laboratory tests

LOINC: Gentamicin is a component

SNOMED: Gentamicin is a substance

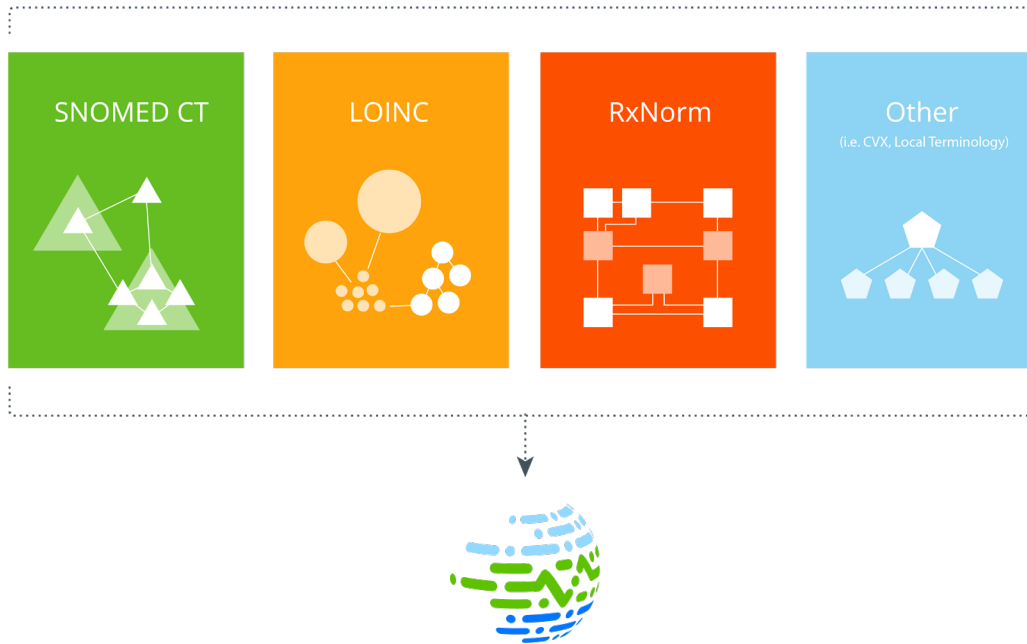
RxNorm: Gentamicin is an ingredient

SNOMED: Gentamicin is a PRODUCT

SNOMED: Gentamicin 0.3% preservative-free eye drops

RxNorm: Gentamicin sulfate 0.3% Ophthalmic Solution

RxNorm: Gentamicin is a PRODUCT



Integration of terminology in a common model

Enabling Collaboration
in Health IT



Standardizing
the
Standards



Integrating
Customized
Clinical
Content



Using
Open
Source
Software



Removing
Ambiguity in
Overlapping
Terminologies



Improving
Patient Care

SOLOR is an integrated terminology system, founded upon SNOMED, LOINC, and RxNorm.

SOLOR awarded the FedHealthIT 2018 Innovation Award

June 2018

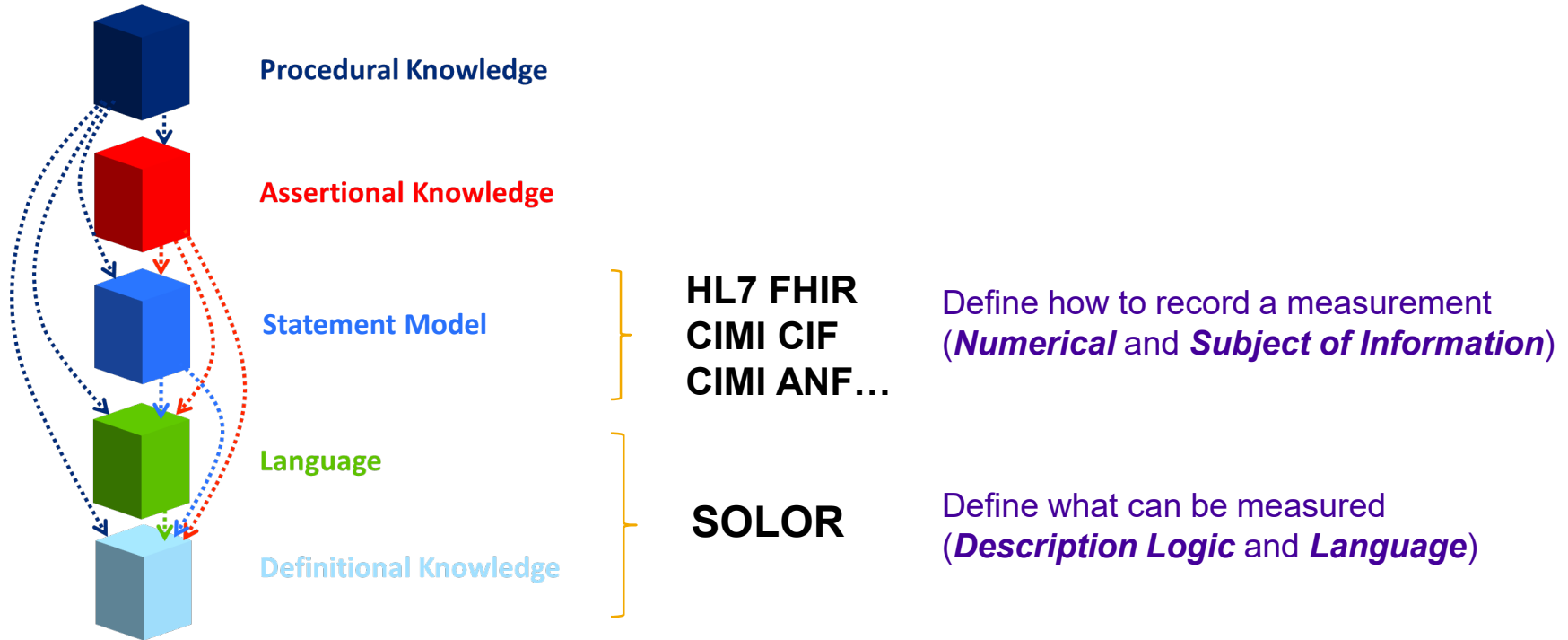
HSPC highlighted SOLOR as mission critical at the HSPC 17th General Meeting

July 2018

Suicide Risk

Instrument	Total Terms	Existing Terms	SOLOR Terms
Columbia Suicide Severity Rating Scale Screener	7	6	1
VA Comprehensive Suicide Risk Assessment	447	41	318
VA Suicide Behavior Overdose Report	79	15	36
VA Suicide Safety Plan	19	2	14
VA-CDC Self-Directed Violence Classification System	22	4	18
VA Mental Health Psychotherapy Procedure Terms	12	9	3
Total	586	76 (13%)	390 (67%)

Architectural Layers



Analysis Normal Form (ANF)

ANF is a simple statement model.

Statement	
Narrative	Right Radial Pulse observed to be 100 bpm on 4/23/2018 9:15 am PST
Topic	[pulse rate]-(location)->[right radial artery]
Subject of info	Subject of Record
Statement time	4/23/2018 9:15 am PST
Performance/ Request Circumstance	100 BPM

Why SOLOR & ANF

Integrated terminology: SOLOR

- Provide integrated content in a standardized way
- Open up the silos and integrate
- Reduce complexity

Statement model: CIMI ANF and Iseosemantic equivalents

- Need to be able to express clinical concepts precisely
- Need to “know” equivalence among clinical concepts
- Need to be able to error check complex representations at scale

**Thank you to
all participants.**



Thank you!


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Q&A



Question 1

Dr. Barone is creating a preoperative History and Physical template in the VA EMR (CPRS) which will as much as possible duplicate all of the requirements of the "Surgery Master Note" used by the DoD at Ft Bragg/ Womack Army Medical Center to minimize re typing by surgeons as they move back and forth between VA and DoD with surgical patients. Influenza immunization status is included in the DoD Surgical "Master Note." Realize that Essentris is the inpatient DoD EMR, and each note represents an episode of care which is archived; there is no comprehensive medical record such as CPRS. In terms of the 5 rights of CDS, influenza immunization status represents:

- A. The right information
- B. To the right people
- C. In the right intervention formats
- D. Through the right channels

Answer

- A. **The right information**
- B. To the right people
- C. In the right intervention formats
- D. Through the right channel

Explanation: Recall that essentris is the DoD inpatient EMR; although the patients are outpatient surgical patients, once admitted to inpatient service, however briefly, they are subject to joint commission inpatient requirements, known as ORYX measures. So while surgeons and OR staff have no interest in the influenza status, as they do not affect surgical outcomes thus ORYX have no place in their workflow, or their intervention or channels. Buy the Joint Commission or the EPRP surveyor, preparing the institution for the Joint Commission survey, the 'right people', will have access to the information they wish to see.

References:

https://www.jointcommission.org/2016_flexible_oryx_reporting_options_measure_set_selection_instructions_and_forms/

https://www.jointcommission.org/facts_about_oryx_for_hospitals/

Question 2

The Womack Army Medical Center Surgery Master Note has a CDS tool for DVT (Deep Venous Thrombosis) prophylaxis. What would be the most useful implementation of such CDS?

- A. A link to the most recent guidelines so the surgeon could decide for him/herself
- B. A link to the orders
- C. Cabrini Scoring System
- D. Cabrini Scoring System with recommended dosages including adjustments for creatinine clearances

Answer

- A. A link to the most recent guidelines so the surgeon could decide for him/herself
- B. A link to the orders
- C. Cabrini Scoring System
- D. Cabrini Scoring System with recommended dosages including adjustments for creatinine clearances**

Explanation (why this is the correct answer and the others are incorrect): the purpose of CDS is to guide the physician to the correct decision and to make it easy to implement that decision with as little effort as possible; Cabrini allows the provider to answer pertinent questions, gives the weighted score and then suggests treatment based upon the weighted score. The other questions require that the physician leave the page, read information, make decisions, and then decide treatments while having to search multiple sources.

References: <https://www.cdc.gov/dhds/pubs/guides/best-practices/clinical-decision-support.htm>

Question 3

Your health care system intends to implement a clinical decision support (CDS) tool to assist clinical providers to perform effective suicide risk assessment in patients with known depressive symptoms. You convene a Clinical Subject Matter Expert (SME) Team to work in concert with a hospital IT Technical Team to identify and vet clinical content to be included in the CDS tool.

After two weeks of meetings, the Clinical SME Team complains that the technical format adopted by the Technical Team for recording clinical content is difficult for the Clinical SMEs to review for accuracy and appears to be altering intended clinical workflow for the CDS tool.

The Technical Team insists that they have recorded accurately the content selected by the Clinical SMEs, that clinical workflow cannot be fully defined at this stage of the process, and that the recording format in use by the Technical Team is necessary to facilitate the next step of authoring the CDS tool itself. Communication between the teams is at a standstill as the Clinical SMEs say they cannot sign off on the content because they find the Technical Team format too difficult to follow.

Question 3 (continued)

Which of the following strategies would have best prevented the current impasse in communication and work effort between the Clinical SME Team and the Technical Team?

- A. Have the Clinical SME Team work separately from the Technical Team to create their own method of recording clinical content and pass it on to the Technical Team. Do not allow the SME Team to revisit the content again once the Technical Team formats the content for use in the EHR.
- B. Assign the Clinical SME Team alone to execute both steps of 1) identifying and vetting clinical content for the CDS tool and 2) creating the format that should be used by the Technical Team for authoring the CDS tool for use the electronic record
- C. Have the Technical Team use existing clinical content such as from a published clinical practice guideline to create the first draft of the clinical content and format it, then send the draft to the Clinical SME team asking them to restrict comments strictly to the accuracy of the clinical content and to not comment on formatting.
- D. Before beginning work on the clinical content, have the Technical Team and Clinical SME Team collaboratively agree upon the approach that will be used to record and format clinical content - both to allow the Clinical SME Team to accurately vet clinical content and to allow the Technical Team to use the vetted content in the technical authoring of the CDS tool for eventual use in the electronic health record.

- D. Before beginning work on the clinical content, have the Technical Team and Clinical SME Team collaboratively agree upon the approach that will be used to record and format clinical content - both to allow the Clinical SME Team to accurately vet clinical content and to allow the Technical Team to use the vetted content in the technical authoring of the CDS tool for eventual use in the electronic health record.**

Explanation: Having both the Clinical SME Team and the Technical Team together agree at the outset on the collaborative process and recording format will give the teams the opportunity to set and manage expectations realistically from the beginning of their work, and provides the best opportunity to establish a process that will lead to an outcome of a CDS tool that is both clinically and functionally accurate in the electronic health record. Answer A is not correct because this approach runs the risk that the Technical Team will not accurately interpret the clinical content vetted by the Clinical SME Team, and without a final validation check performed by the Clinical SME Team such an error would be missed. Answers B and C are both incorrect because both approaches assign the primary responsibilities for two different functions (identifying and vetting clinical content versus technical authoring of vetted content for use in the electronic health record) to only one team; the different expertise from each team is needed to correctly carry out the functions required to create the CDS tool properly.

Reference: Ash JS, Sittig DF, Guappone KP, Dykstra RH, Richardson J, Wright A, et al. Recommended practices for computerized clinical decision support and knowledge management in community settings: a qualitative study. *BMC Medical Informatics and Decision Making* 2012, 12:6. doi: 10.1136/bmj.a2752. PubMed PMID: 22333210; PubMed Central PMCID: PMC3334687. Available from: <http://www.biomedcentral.com/1472-6947/12/6>

Question 4

A key early step in creating knowledge artifacts for clinical decision support is engaging clinical domain experts who will ensure that the knowledge represented is clinically correct. Which of the following is most likely to result in an engaged, enthusiastic group of subject matter experts?

- A. Recruitment of clinical leadership who can bring organizational priorities to the table
- B. Selection of topics for knowledge artifact creation that the informatics community knows are important to the organization
- C. Selection of topics for knowledge artifact creation by clinical leadership, based upon clinical domain priorities
- D. If available, recruitment of clinical experts with dedicated non-clinical time for addressing the organization's clinical domain priorities

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- D. If available, recruitment of clinical experts with dedicated non-clinical time for addressing the organization's clinical domain priorities

Explanation: If SME's see knowledge artifact creation as a means to advance their own priorities they will be highly enthusiastic. The other choices are also correct, but less likely to result in enthusiastic participants.

¹Osheroff JA, Teich JM, Levick D, Saldana L, Velasco FT, Sittig DF, Rogers KM, Jenders RA. Improving outcomes with clinical decision support: an implementer's guide. 2nd ed. Healthcare Information and Management Systems Society; 2012.

Question 5

If clinicians believe your decision support tools are clinically incorrect they are unlikely to trust and use them². Which of the following is most likely to be effective in ensuring that clinical content is represented correctly in a clinical decision support tool?

- A. Informaticians can restrict their review of clinical content to materials that technical authors have formally structured for implementation in an EHR, since clinical SMEs have already reviewed the materials in natural language format.
- B. When asking clinical SMEs to review and vet clinical content for a CDS tool, either provide the content for review exclusively in natural language format, or provide technical assistance to clinical SMEs as they review content that has been formally structured for implementation in an EHR.
- C. Informaticians can review clinical content in knowledge artifacts without availability of the precise verbiage in clinical guidelines, since clinical SMEs have already reviewed and approved those guidelines before they were incorporated into the knowledge artifacts by technical authors.
- D. Only use clinical SMEs who are not practicing clinicians in the institution but who are seasoned informaticians.

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- C. Informaticians can review clinical content in knowledge artifacts without availability of the precise verbiage in clinical guidelines, since clinical SMEs have already reviewed and approved those guidelines before they were incorporated into the knowledge artifacts by technical authors.
- D. Only use clinical SMEs who are not practicing clinicians in the institution but who are seasoned informaticians.

Selection b is correct (continued next slide.)

Answer (continued)

Explanation:

- Once technical structure is introduced into documents SMEs may have difficulty providing reliable review for clinical accuracy.
- Informaticians who are providing review of structured documents must also have at hand both the clinical content that SMEs approved in natural language format and the clinical guidelines upon which they are based, to ensure that SME intent is accurately represented in knowledge artifacts.

Reference: ²Saleem JJ, Militello LG, Arbuckle N, Flanagan M, Haggstrom DA, Linder JA, Doebbeling, BN. Provider Perceptions of Colorectal Cancer Screening Clinical Decision Support at Three Benchmark Institutions. AMIA Symposium Proceedings. 2009;558-562.

Question 6

SOLOR is an integration of terminology content delivered in a single common model. SOLOR uses which Meaningful Use standards as its foundation?

- A. SNOMED, LOINC, RxNorm, CPT, and ICD codes
- B. SNOMED, LOINC, and NDC codes
- C. SNOMED, LOINC, and RxNorm codes
- D. SNOMED, MeSH, CVX, and NDC codes

- A. SNOMED, LOINC, RxNorm, CPT, and ICD codes
- B. SNOMED, LOINC, and NDC codes
- C. SNOMED, LOINC, and RxNorm codes**
- D. SNOMED, MeSH, CVX, and NDC codes

Explanation: SOLOR (System Of LOGical Representation) is a platform that integrates clinical terminologies in a way that enhances their collective use in healthcare applications and keeps the health information exchanged completely intact. The three terminologies, SNOMED CT, LOINC, and RxNorm, form the foundation of SOLOR because they are meaningful use standards which when integrated together represent a breadth of information necessary for clinical data representation. SOLOR facilitates their integration by transforming these disparate systems into a single common model. CPT (Current Procedural Terminology), ICD (International Classification of Diseases), CVX (codes for vaccine product), and NDC (National Drug Code) all are standard medical code sets and are not meaningful use standards. MeSH (Medical Subject Headings) is the NLM controlled vocabulary thesaurus used for indexing articles for PubMed.

References:

SOLOR [Internet] . HSPC; c2017 [cited 2018 Oct 19]. Available from: <http://solor.io/>

SOLOR [Internet]. How Solor is Different From Mapping. Solor Capabilities. Informatics, Inc. HSPC; c2017 [cited 2018 Oct 19]. Available from: <http://solor.io/how-solor-is-different-from-mapping/>

Back-up Slides



Periop workflow and CDS; VA to DoD

- Consult is created to take VA patient to DoD facility for surgery by VA
 - This creates 'IOU' for payment to DoD for their OR and supplies
- IOU is authorized, VA representative prints out demographics and walks to next cubicle to DoD counterpart to deliver printout
- DoD rep 'creates' patient in CHCS, or activates previous instance if patient has had care at DoD before
- "PAD" note created: shell for this episode of care, all documents will exist within this shell, which will be eventually completed and archived
 - No comprehensive EHR in DoD such as CPRS, Essentris is a collection of episodes of care, the 'inpatient' record for the DoD, Ahlta is the 'outpatient' record, only allergies and meds flow in from Ahlta to Essentris, otherwise must be manually entered in Med Reconciliation note* in Essentris for CDS (DDI and Drug Allergy alerts, etc)

Periop workflow and CDS; VA to DoD

- Problems
 - H&P- cut and paste
 - Update-type and sign
 - Consent- cut and paste or search through drop downs
 - Preop Instructions- cut and paste or search through drop downs
 - Postop Instructions- cut and paste or search through drop downs
 - VTE prophylaxis decision tree and orders#- do
 - DNR status#*-do
 - Immunization status(?!)*#- type in if done, when

* HEDIS

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CDS Being Co-opted for Quality Measures

Periop workflow and CDS; VA to DoD

- VA Nursing PREOP evaluation/ DoD Pre Admission
 - Should happen once, VA if VA anesthesia, DoD if DoD anesthesia
 - Can be telephonic/VVC if clinically indicated
 - Preop teaching, demographics
 - MED RECON!!!*#

* HEDIS

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