

Interface Terminology to Facilitate the Problem List Using SNOMED CT and other Terminology Standards

**Kshitij Saxena MD, MHSA
Regional Medical Director,
Adventist Health System**

Agenda

- Introduction
- Problem list benefits and issues
- Issues facing the transformation
- EHR Implementation Issues
- Constant Change
- Questions and Discussion

Introduction

- About me – medical informatician, not a terminologist
- About Adventist Health
 - One of the largest Not for profit health system
 - 44 hospitals nationwide
 - 7700 + licensed acute care beds
 - Serving 4 million patients each year in inpatient, outpatient and ER visits

Introduction

- Problem list/Meaningful use compliance
 - Current status – 100% compliance rate for problem list documentation
 - Introduced CDSS/Alert for problem list documentation
 - experiences so far – bitter/sweet
 - Working on improving the process, so focus is on identifying issues and challenges and general approaches

Problem List Benefits

- Clinical Documentation
- Continuity and follow-up
- Drive clinical decision-support systems
- Keep active problems highly visible
- Runs Horizontally in patient records
(Document once, will be present in next visit)
- Prioritization of diagnoses and procedures
- Generate codes for reimbursement and reporting

Issues facing the Transformation

Poor Quality of Match (Semantically Ambiguous)

Excessive Pre-coordination

Achieving interoperability with Data Migration

Developing and evolving non informatics trained staff

How to map categories of concepts left out by design

How to address hierarchical ambiguity in SNOMED CT

Issue of complex compositional mapping

Not finding the right code by coding staff

Poor Quality of Match (Semantically Ambiguous)

- Ideally, all matches exact or synonymous
- Often no good matches found
- Types of matches in the literature
 - Exact
 - Inexact
 - Modeling needed
 - Classification language
 - No match found (NF)

Poor Quality of Match (Semantically Ambiguous)

- Poor quality of match – Exact, Inexact, Model, Synonym, NOS, NEC, NF
- Suggested Resolutions –
 - Same as map (mapped from source term to corresponding target concept)
 - If exact match does not exist, map to nearest source term
 - For inexact matches, additional relationships can be added

Excessive Pre-coordination

- Creating concepts by combining concepts with prepositional phrases such as ‘with’, ‘without’, ‘without mention of’
- Suggested Resolution –
 - If exact map exists, map to corresponding target concept (same as map)
 - Ignore ‘without mention of’; map to generic condition
 - If an exact match does not exist, map to nearest point

Achieving interoperability with Data Migration

- How to achieve interoperability with SNOMED CT, when migrating from ICD-9
- Suggested Resolution –
 - IHTSDO provides equivalence map, but not for billing purposes
 - IHTSDO rules based map exists, working with EMR Vendor to provide support

Developing and evolving non informatics trained staff

- How to develop staff/users to target SNOMED CT concepts accurately
- Suggested Resolution –
 - Different approaches (in house or outsource)
 - Even if outsource, still need internal resources
 - In house, hire people with terminology experience
 - Send people to training programs from IHTSDO

How to map categories of concepts left out by design

- These include qualifiers, procedures, substances, organisms and body parts
- Suggested Resolution –
 - Priority on mapping diseases and findings as per ‘meaningful use’
 - Use corresponding disease and problem concepts if possible
 - Use additional relationships (e.g., finding site, causative agent etc.)
 - Represent items using different areas in EHR e.g., orders, labs, medications etc.

How to address hierarchical ambiguity in SNOMED CT

- For e.g., ‘Sprain’ being defined as morphologic abnormality and ‘sprain of ankle’ descending from clinical finding
- Suggested Resolution –
 - While mapping use only fully specified names, not synonyms, which include domain information (e.g., morphological abnormality, disorder, finding)
 - Mappers need to be trained about different domains

How to address hierarchical ambiguity in SNOMED CT

The screenshot shows the IMO Terminology Portal interface. A search window is open with the search term "bart frac rad". The results are displayed in a table with columns for Title, ICD-9-CM, ICD-10-CM, and SNOMED CT. The search results are as follows:

Title	ICD-9-CM	ICD-10-CM	SNOME...
▶ Barton's fracture of radius	813.42	S52.569A	54645004
▶ Barton's fracture of distal radius, closed	813.42	S52.569A	307713000
▶ Barton's fracture of left radius	813.42	S52.562A	54645004
▶ Barton's fracture of right radius	813.42	S52.561A	54645004
▶ Closed Barton's fracture of radius	813.42	S52.569A	307713000
▶ Closed Barton's fracture of radius with delayed healing	V54.12	S52.569G	307713000
▶ Closed Barton's fracture of radius with malunion	733.81	S52.569P	307713000
▶ Closed Barton's fracture of radius with nonunion	733.82	S52.569K	307713000
▶ Closed Barton's fracture of radius with routine healing	V54.12	S52.569D	307713000
▶ Open Barton's fracture of radius, type III	813.52	S52.569C	307712005
▶ Open Barton's fracture of radius, type III, with delayed healing	V54.12	S52.569J	307712005

The interface also shows a patient profile for "Test Patient (35F)" and various navigation options like "Medical Necessity", "Mutual Exclusions", and "DRG".

How to address hierarchical ambiguity in SNOMED CT

IMO Terminology Portal: Problem List

Portal: ProblemIT Professional

Context: All Records

Search: bart frac rad

Title	ICD-9-CM	ICD-10-CM	SNOME...
▶ Barton's fracture of radius	813.42	S52.569A	54645004
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Select IMO Term Request Cancel

Issue of complex compositional mapping

- Requires many ICD-9 codes must necessarily be converted to SNOMED CT equivalents manually
- Suggested Resolution –
 - Focus should be on clinical terms, not ICD-9 codes
 - Clinical terms may require multiple ICD-9 codes

Issue of complex compositional mapping

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Search: bart frac rad

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Post-Coordination Approach

#	Encounter type	#	Fracture healing	#	Fracture type	#	Laterality
165	initial encounter	178	routine healing	174	closed fracture	229	unspecified laterality
166	subsequent encounter	179	delayed healing	176	open fracture type I or II	228	left
167	sequela	180	nonunion	177	open fracture type IIIA, IIIB, or IIIC	230	right
		181	malunion				

Pre-Coordination Approach

Title	ICD-10-CM	Modifiers
Barton's fracture of radius, unspecified laterality, sequela	S52.569S	167,229
Barton's fracture of radius, unspecified laterality, closed, initial encounter	S52.569A	165,174,229
Barton's fracture of radius, unspecified laterality, open type I or II, initial encounter	S52.569B	165,176,229
Barton's fracture of radius, unspecified laterality, closed, with delayed healing, subsequent encounter	S52.569G	166,179,17...
Barton's fracture of radius, unspecified laterality, open type I or II, with nonunion, subsequent encounter	S52.569M	166,180,17...

Select IMO Term Request Cancel

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Not finding the right code by coding staff

- Busy Clinicians/coders may abandon the search for a concept if they cannot find it readily
- Suggested Resolution –
 - Need clinician friendly, familiar terms
 - Support for abbreviations, acronyms, colloquialisms, misspellings etc.
 - Need easy search ability (good search algorithms, option of DYM/did you mean, good work index, ranking search results)

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Post-Coordination Approach

#	Encounter type	#	Fracture healing	#	Fracture type	#	Laterality	
165	initial encounter	178	routine healing	174	closed fracture	229	unspecified laterality	ICD10CM: S52.562D, Barton's fracture of left radius, subsequent encounter for closed fracture with routine healing
166	subsequent encounter	179	delayed healing	176	open fracture type I or II	228	left	
167	sequela	180	nonunion	177	open fracture type IIIA, IIIB, or IIIC	230	right	IMO (Hyper PreCoordinated) Lexical: 25418603, Barton's fracture of radius, left, closed, with routine healing, subsequent encounter
		181	malunion					

Pre-Coordination Approach

Title	ICD-10-CM	Modifiers
Barton's fracture of radius, left, closed, with routine healing, subsequent encounter	S52.562D	166,178,17...

Select IMO Term Request Cancel

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Meaningful Use Problem List Requirements

- Maintain active and updated problem list with SNOMED CT
- How to achieve interoperability with SNOMED CT when migrating from legacy data?

Terminology Migration Challenges (not an exhaustive list)

- Migration challenges
 - Administrative and classification verbiage
 - Excessive pre-coordination and negation
 - Multiple domains
 - Multiple hierarchies
- EHR Implementation issues
- Organizational challenges
- Constant change

Terminology Migration Challenges (not an exhaustive list)

- Uncertain algorithmic contortions
- Matching extensively pre-coordinated concepts with negation can make clinical documentation and data migration difficult
- For example, 'Chronic duodenal ulcer without hemorrhage AND without perforation but with obstruction'
 - Difficult to recognize and transform from one language to other.

EHR Implementation Issues

- Historically designed for administrative codesets only
- Not designed for multiple sources for diagnoses and problem lists
- May only support one code per term
 - Often need multiple codes
- Each system handles terminology differently
 - Systems from one vendor may vary significantly
 - Analyses and adjustments needed for each system

Constant Change

- Regulatory changes – MU stages
- Terminology changes
 - Updates
 - ICD-9-CM to ICD-10-CM
 - SNOMED CT RF1 to RF2
- EHR changes – New versions, adding new features and facilities
- Guidelines and quality measures
- Obamacare???

Discussion and Questions ?





*Extending the healing
ministry of Christ*