Mapping between ICD (9-CM and 10-CM) and SNOMED CT

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Current NLM Roles

- Distributor of HIPAA classifications & code sets *AND* terminologies required for EHR certification within UMLS
- Designated HHS coordinating body for clinical terminologies (including developing relevant mappings)
- Terminologies:
  - **LOINC**: a major funder
  - **RxNorm**: developer
  - **SNOMED CT**: payer of US IHTSDO membership that enables US use

Focus on Mappings Between SNOMED CT and ICD

- SNOMED CT to ICD-9-CM
- SNOMED CT to ICD-10 (international version)
- SNOMED CT to ICD-10-CM
- ICD-9-CM to SNOMED CT

Problem list – Map Issue #1

- **Target:** SNOMED CT
- **Issue:** Transition from use of ICD-9-CM for problems
  - Available from IHTSDO:
    - Conceptual mapping **from** SNOMED CT **to** ICD-9-CM
      - Minimal maintenance – planned to phase out by 2013
  - Available from NLM:
    - Synonymous mappings in UMLS Metathesaurus
    - April 2012: Trial map for evaluation
      - **from** heavily used ICD-9-CM **to** SNOMED CT
      - Trial version based on CMS data (codes used in the Medicare Program)
        - » ~40% will NOT be 1-to-1 mappings

Problem list – Map Issue #2

- **Target:** SNOMED CT
- **Issue:** Use of SNOMED CT to generate encounter diagnoses (in ICD-10-CM or ICD-9-CM) for billing/statistics
  - Available from IHTSDO:
    - Conceptual mapping **from** SNOMED CT **to** ICD-9-CM
      - Minimal maintenance – planned to phase out by 2013
  - Available from NLM:
    - Synonymous mappings in UMLS Metathesaurus
    - Old (2008) rule-based map **from** SNOMED CT subset **to** ICD-9-CM
      - Working with ONC and NCHS to determine priority for updating if necessary
    - **NEW**: FROM SCT subset to ICD-10-CM, with demonstration tool
      - February 29, 2012: From 7,277 SNOMED CT concepts
      - June 2012: Complete initial map. From ~15,000 SNOMED CT concepts
        - » Leverages procedures, data & tools from the IHTSDO and UK NHS Terminology Centre and data from Kaiser Permanente's CMT donations

SNOMED CT to ICD-10-CM Map

http://www.nlm.nih.gov/research/umls/mapping_projects/snomedct_to_icd10cm.html

Download the Map

SNOMED CT to ICD-10-CM Map Version	Derived from SNOMED CT version	Derived from ICD-10-CM version	Documentation
SNOMEDCT_ICD10CM_map.201202	July 2011 International Release	2011	Release Notes (PDF)

Supporting Materials

- **I-MAGIC Demo Page** – to see the Map in action. The I-MAGIC (Interactive Map-Assisted Generation of ICD Codes) Algorithm utilizes the SNOMED CT to ICD-10-CM Map in a real-time, interactive manner to generate ICD-10-CM codes. This demo simulates a problem list interface in which the user enters problems with SNOMED CT terms, which are then used to derive ICD-10-CM codes using the Map.
- **Technical Documentation** (PDF) for the SNOMED CT to ICD-10-CM Map and accompanying exemplar file (Excel).
- **Frequently Asked Questions**
- **Mapping from SNOMED CT to ICD-10 and ICD-10-CM** presented by Dr. Kin Wah Fung at HIMSS (Healthcare Information and Management Systems Society) 2012 Conference

Introduction

SNOMED CT (**S**ystematized **No**menclature of **Med**icine-**C**linical **T**erms) is considered to be the most comprehensive, multilingual clinical healthcare terminology in the world. It is designed for use in clinical documentation in the Electronic Health Record (EHR). The purpose of the SNOMED CT to ICD-10-CM map (herein referred to as "the Map") is to support semi-automated generation of ICD-10-CM codes from clinical data encoded in SNOMED CT for reimbursement and statistical purposes.

Use cases supported

The Map can be used in the following scenarios:

- **Real-time use by the healthcare provider** – In this scenario, the Map is embedded in the problem list application of the EHR used by the physician or other healthcare provider. At the end of a clinic encounter, the clinician updates the problem list, which is encoded in SNOMED CT. The Map-enabled problem list application outputs a list of ICD-10-CM codes based on algorithmic evaluation of map rules, which makes use of patient context (e.g. age, gender) and co-morbidities (other problems on the problem list) to identify the most appropriate candidate ICD-10-CM codes, in accordance with ICD-10-CM coding guidelines and conventions. If necessary, the clinician is prompted for additional information to decide between alternative codes, or to refine the output codes. The clinician confirms the suggested ICD-10-CM codes. (See the I-MAGIC algorithm and demo page)
- **Retrospective coding by coding professionals** – In this scenario, the Map is used within an application to suggest candidate ICD-10-CM codes to coding professionals based on a stored SNOMED CT encoded problem list. The degree of automation can vary. Textual advice can be displayed in cases where automated rule processing is not available.

Intended uses of the map

- Embedded in the EHR for real-time, interactive ICD codes generation (I-MAGIC=Interactive Map-Assisted Generation of ICD Codes)

- To assist coding professionals by suggesting ICD codes based on SNOMED CT-encoded problem list entries

Two mapping projects

- **SNOMED CT to ICD-10** (international version)
  - Joint effort between IHTSDO and WHO
  - International participation (including USA, UK, Canada, Sweden, Australia, and New Zealand)
  - Funded by IHTSDO with a lot of volunteer contribution

- **SNOMED CT to ICD-10-CM**
  - Led by NLM with direct involvement from National Center for Health Statistics (NCHS)
  - Methodology and tools – based on ICD-10 Map project

- Collaboration between the 2 projects – people, methodology, tooling, mapping data

- Stronger collaboration expected in future through IHTSDO mapping service under development

Priorities for phase 1 work

- **ICD-10 map**
  - NLM's CORE Problem List Subset
  - SNOMED CT concepts that correspond to top ranking ICD-10 codes in 5 countries

- **ICD-10-CM map**
  - NLM's CORE Problem List Subset
  - Donated content from Kaiser Permanente's Convergent Medical Terminology (CMT)
    - top 2,500, sub-specialty subsets (cardiology, neurology, mental health, musculo-skeletal)

SNOMED CT concepts that are in scope for mapping

- Any concept in the following three SNOMED CT hierarchies
  - Clinical finding
  - Event
  - Situation with explicit context
- Total about 110,000 concepts in scope

Work progress

- **SNOMED CT to ICD-10 map**
  - Preview publication of maps for 5,000 concepts in September 2011
  - Final publication of phase 1 maps (about 20,000 concepts) planned for April 2012

- **SNOMED CT to ICD-10-CM map**
  - Planned release dates
    - February 2012 – preview release (7,277 concepts)
    - June 2012 – full phase 1 maps (15,000 concepts)

I-MAGIC

| Instructions | Demo |

The I-MAGIC (Interactive Map-Assisted Generation of ICD Codes) Algorithm utilizes the SNOMED CT to ICD-10-CM Map in a real-time, interactive manner to generate ICD-10-CM codes. This demo simulates a problem list interface in which the user enters problems with SNOMED CT terms, which are then used to derive ICD-10-CM codes using the Map.

Name: My Patient Gender: Date of Birth:

Problem List (SNOMED-CT terms)

What's wrong with the patient? Please add problem(s) here. (Hint: type 'dizzy')

Action	SNOMED-CT Name
Add	Problem:

(Only SNOMED CT terms included in the published SNOMED CT to ICD-10-CM Map are shown.)

Update List Get ICD Codes Add Complex Examples:

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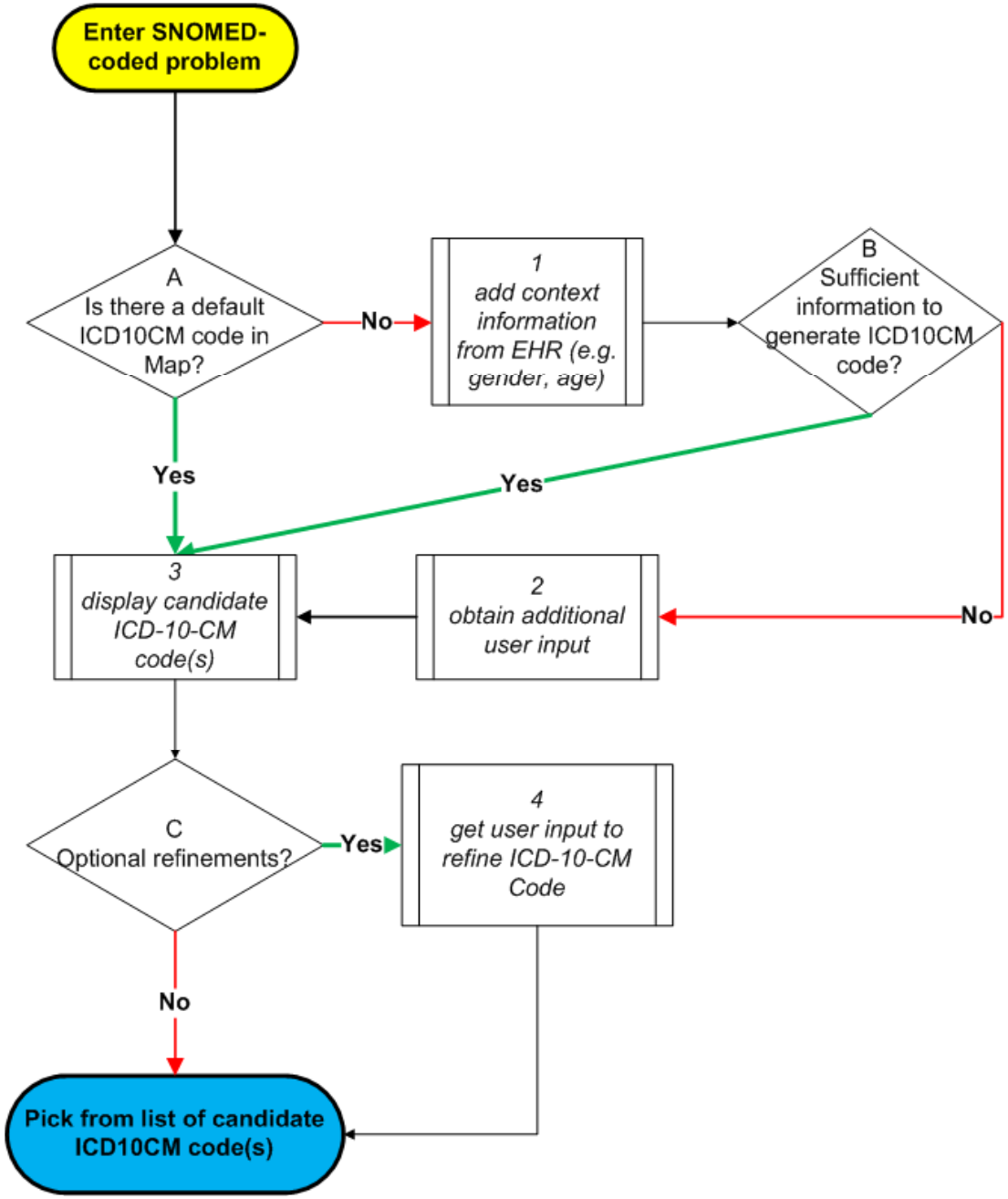

Interactive Map-Assisted Generation of ICD Codes (I-MAGIC) Algorithm

I-MAGIC

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Name: Male adult 1 Gender: Male Date of Birth: 1965-12-01

Problem List (SNOMED-CT terms)

What's wrong with the patient? Please add or remove problem(s) here.

Action	SNOMED-CT Name
☐ Remove	Apnea
☐ Remove	Hypercholesterolemia
☐ Remove	Histoplasmosis with meningitis
☐ Remove	Herniated urinary bladder
☐ Remove	Diabetes mellitus type 2
☐ Remove	Hypertensive heart failure
Add	Problem:

(Only SNOMED CT terms included in the published SNOMED CT to ICD-10-CM Map are shown.)

Update List | Get ICD Codes | Add Complex Examples:

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Name: Male adult 1 Gender: Male Date of Birth: 1965-12-01

Mapping Problems to ICD-10-CM

SNOMED-CT	ICD-10-CM Code	ICD-10-CM Name	Optional refinement
Apnea (1023001)			
	R06.81	Apnea, not elsewhere classified	
Hypercholesterolemia (13644009)			
	E78.0	Pure hypercholesterolemia	
Histoplasmosis with meningitis (187057005)			Refine problem
	B39.9	Histoplasmosis, unspecified	ICD notes
	G02	Meningitis in other infectious and parasitic diseases classified elsewhere	
Herniated urinary bladder (410070006)			
	N32.89	Other specified disorders of bladder	
Diabetes mellitus type 2 (44054006)			
	E11.9	Type 2 diabetes mellitus without complications	ICD notes
Hypertensive heart failure (46113002)			
	I11.0	Hypertensive heart disease with heart failure	ICD notes
	I50.9	Heart failure, unspecified	ICD notes

Submit Refinement | Back to Problem List

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Apnea (1023001)			
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Hypercholesterolemia (13644009)			
	E78.0	Pure hypercholesterolemia	
Histoplasmosis with meningitis (187057005)			Refine problem
		Problem refinement Would one of the following specific diagnoses apply? ○ Histoplasma duboisii with meningitis ○ Histoplasma capsulatum with meningitis ○ *The above choices are **not applicable*** ☐ Replace the original problem with the more specific diagnosis	
	B39.9	Histoplasmosis, unspecified	ICD notes
	G02	Meningitis in other infectious and parasitic diseases classified elsewhere	
Herniated urinary bladder (410070006)			
	N32.89	Other specified disorders of bladder	
Diabetes mellitus type 2 (44054006)			
	E11.9	Type 2 diabetes mellitus without complications	ICD notes
Hypertensive heart failure (46113002)			

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	E78.0	Pure hypercholesterolemia	
Histoplasmosis with meningitis (187057005)			Refine problem
	B39.9	Histoplasmosis, unspecified	ICD notes
	G02	Meningitis in other infectious and parasitic diseases classified elsewhere	
Herniated urinary bladder (410070006)			
	N32.89	Other specified disorders of bladder	
Diabetes mellitus type 2 (44054006)			
	E11.9	Type 2 diabetes mellitus without complications	ICD notes
Hypertensive heart failure (46113002)			
	I11.0	Hypertensive heart disease with heart failure	ICD notes
	I50.9	Heart failure, unspecified	ICD notes

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Hypercholesterolemia (13644009)			
	E78.0	Pure hypercholesterolemia	
Histoplasmosis with meningitis (187057005)			Refine problem
	B39.9	Histoplasmosis, unspecified	ICD notes
	G02	Meningitis in other infectious and parasitic diseases classified elsewhere	
Herniated urinary bladder (410070006)			
	N32.89	Other specified disorders of bladder	
Diabetes mellitus type 2 (44054006)			
	E11.9	Type 2 diabetes mellitus without complications	ICD notes
		ICD notes for "Type 2 diabetes mellitus"	
		Use additional code to identify any insulin use (Z79.4)	
Hypertensive heart failure (46113002)			
	I11.0	Hypertensive heart disease with heart failure	ICD notes
	I50.9	Heart failure, unspecified	ICD notes

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http://imagic.nlm.nih.gov/imagic/code/map

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Name: Female adult 1 Gender: Female Date of Birth: 1958-05-01

Mapping Problems to ICD-10-CM

SNOMED-CT	ICD-10-CM Code	ICD-10-CM Name	Optional refinement
Carcinoma in situ of breast (189336000)			
	D05.90	Unspecified type of carcinoma in situ of unspecified breast	Laterality
Anemia in ovarian carcinoma (307726001)			
	C56.9	Malignant neoplasm of unspecified ovary	Laterality
	D63.0	Anemia in neoplastic disease	
Mild depression (310495003)			
	F32.0	Major depressive disorder, single episode, mild	
Failure to gain weight (36440009)			
	R62.7	Adult failure to thrive	
Herniated urinary bladder (410070006)			
	N81.10	Cystocele, unspecified	

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Questions

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