

Technical Track

Definitions, Assumptions and Issues

11a.m. -12 Noon Architectural Proposals/Solutions



*Stuart J. Nelson, MD
National Library of
Medicine, Head of
Medical Subject Headings*

*Kent Spackman, MD,
Oregon Health Sciences
University, SNOMED-CT®
Editorial Board*

Technical Approach to Crossmaps: SNOMED CT Structures

Kent A. Spackman
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Topics covered

- General mapping issues
- SNOMED's Mapping Table Structures
- Examples
- New Developments

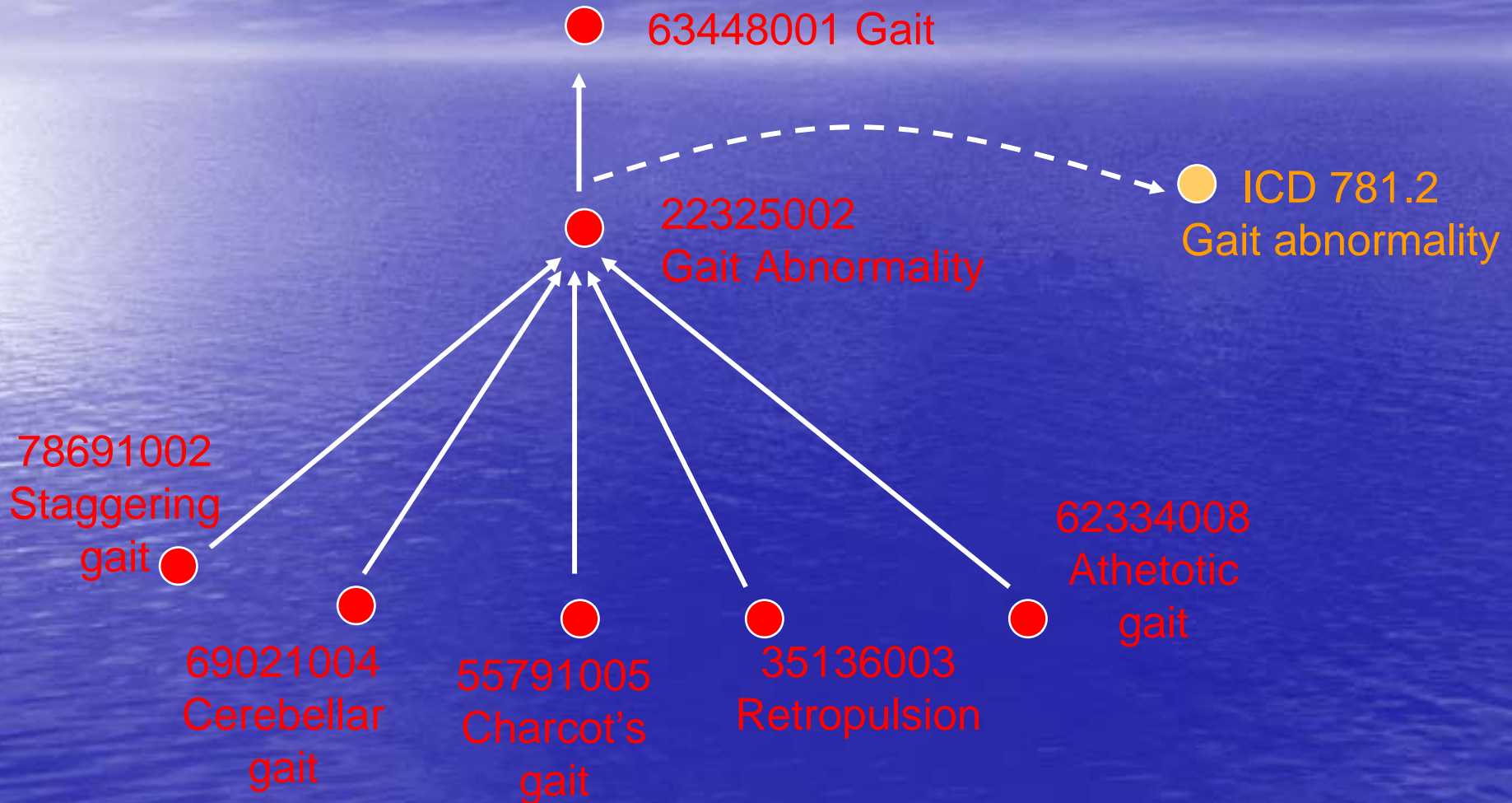
In general

- SNOMED Cross-maps show the correspondence between SNOMED codes and codes in other systems
- Mapping is **from** a single SNOMED CT code **to** one or more Targets
- Mapping will only sometimes be one-to-one

SNOMED hierarchies that should in general be mappable to ICD-9-CM

- Clinical findings
- Context-dependent categories
- Any of these codes that cannot be mapped are explicitly noted to be unmappable

Mapping SNOMED CT to ICD-9-CM



Three mapping tables:

- CrossMapSets
 - Each row characterizes the map for a particular TargetScheme
- CrossMaps
 - Each row represents the mapping of a single Concept to a Cross Map Target
- CrossMapTargets
 - Each row represents a code or set of codes in the Target Scheme

Cross Map Examples

Gait Abnormality (SCTID 22325002),
Cerebellar Gait (SCTID 69021004),
Diabetic Retinopathy (SCTID 4855003)

Crossmap Sets

MapSetId	MapSetName	MapSetSeparator
100046	ICD-9-CM	(vertical bar character)

Crossmaps

MapSetId	MapConceptId	MapTargetId	MapAdvice*
100046	22325002	1860057	1
100046	69021004	1860057	1
100046	4855003	9534498053	1

Crossmap Targets

* 1 = "1 to 1 map"

TargetId	TargetCodes
1860057	781.2
9534498053	250.50 362.01

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Diabetic retinopathy \Rightarrow 250.50
 and 362.01

Exclusion example

SNOMED

- 271737000 Anemia (disorder)

- ICD-9-CM

- 285.9 Anemia, NOS

- But

- In SNOMED, 271737000 Anemia includes chronic blood loss anemia (lower in the hierarchy)

- In ICD, 285.9 explicitly excludes chronic blood loss anemia

Mapping with options

- Required when there are several ways of mapping a concept into a TargetScheme
 - Target scheme may have qualifications (such as inclusions or exclusions)
 - Target Scheme may require other related data about the patient (age, gender, external cause, etc.)

Cardinality and mapping

- **Case 1:** a single SNOMED CT concept may be mapped to either:
 - Single TargetCode
 - Collection of TargetCodes
- The CrossMaps table will point this ConceptID to a **single row** of the CrossMapTargets table
- There is only one mapping in this case; that mapping may point to a **collection** of TargetCodes

Example of such a mapping

SNOMED CT – 27679008

Pulmonary hypertension with extreme obesity

ICD-9-CM - 416.9

Chronic pulmonary heart
disease, unspecified

ICD-9-CM - 278.0

Obesity

Cardinality and mapping

- **Case 2:** a single SNOMED CT concept may be mapped to a **choice** of more than one target code
- The CrossMaps table will point this ConceptID to **multiple rows** of the CrossMapTargets table
- There are multiple mappings in this case; each mapping may point to a **collection** of TargetCodes
- The choice of the specific mapping will depend on additional information in the health record

Example of such a mapping

- Bulnesia sarmientii poisoning (disorder)
35789008
- This single SNOMED concept can map to 5 separate ICD-9-CM statements:
 - 988.2
 - 988.2 / E866.3 (accident)
 - 988.2 / E950.9 (suicide attempt)
 - 988.2 / E962.1 (assault)
 - 988.2 / E980.9 (undetermined)

CrossMapSets

- “Table of contents table” for the mappings to the various TargetSchemes
- Six of the 9 fields are names or identifiers of the target scheme

CrossMapSets Table

Field	Field Type	Permitted Characters	Length
MapSetId	SCTID	Digits from 0-9	6 to 18
MapSetName	String	Any	1 to 255
MapSetType	Integer	Digits from 0-9	1 to 2
MapSetSchemeID	String	Any	1 to 64
MapSetSchemeName	String	Any	1 to 255
MapSetSchemeVersion	String	Any	1 to 12
MapSetRealmID	String	Any	1 to 24
MapSetSeparator	String	Any	1
MapSetRuleType	Integer	Digits from 0-9	1

Possible new field: MapSetUseCaseID

CrossMapSets name and identifier fields

- **MapSetID** - SCTID
- **MapSetName** - Name given by map originator (i.e. by SNOMED)
- **MapSetSchemeID** - Standard identifier (i.e ISO ID or HL-7 OID)
- **MapSetSchemeName** - full name of TargetScheme
- **MapSetSchemeVersion** - Version number as published by the issuing organization
- **MapSetRealmID** - Realm Identifier used only where Realm specific business rules or guidelines alter the acceptable mappings

MapSetType

- Indicates the cardinality of the mapping
 - **Unspecified (0)**
 - **Single (1)**: each concept maps to a single TargetCode; no options or choices
 - **Multiple (2)**: some concepts may map to a list of TargetCodes; no options or choices
 - **Choice (3)**: some maps include choices, but each choice maps to only a single target code
 - **Flexible (4)**: some maps include choices, and some maps may map to a list of target codes

SNOMED CT to ICD-9-CM map

- MapSet Type =2
- Each unique SNOMED concept maps to either a single target code or a set of target codes
- One CrossMap associated with each mappable SNOMED CT concept

CrossMapSets: other fields

- MapSetSeparator
 - Character (such as '|') used as a separator between individual codes in the TargetCodes field of the CrossMapTargets table
- MapSetRuleType
 - This would specify the type of rule used in the CrossMaps and CrossMapTargets tables; not implemented at this time

CrossMapSets excerpt

MapSetID	MapSet Name	MapSet Type	MapSet SchemeID	MapSet Scheme Name	MapSet Scheme Version	MapSet RealmID	MapSet Separator	MapSet Rule Type
100046	ICD-9-CM Map	2	ISO7963	ICD-9-CM	2004	*		*

* Not currently used
in SNOMED CT

CrossMaps table

- Each row of this table does two things:
 - Gives an option for mapping a particular ConceptID to a CrossMapTarget
 - Tells what to do if there are several alternative CrossMap options
- Each option is represented by a row in the CrossMaps table
 - Each row may include rules for choosing that option

CrossMaps Table

Field	Field Type	Permitted Characters	Length
MapSetID	SCTID	Digits from 0-9	6 to 18
MapConceptID	SCTID	Digits from 0-9	6 to 18
MapOption	Integer	Digits from 0-9	1 to 5
MapPriority	Integer	Digits from 0-9	1 to 5
MapTargetID	SCTID	Digits from 0-9	6 to 18
MapRule	String	Any	0 to 255
MapAdvice	String	Any	0 to 255

Possible new fields:

MapID, MapGroup, MapCategory

Alternative CrossMaps

- Four fields help specify the alternatives when a single ConceptID can be mapped to various targets
 - MapOption
 - MapPriority
 - MapRule
 - MapAdvice

Alternatives

- The differences among the four fields concern whether the options are to be manually or automatically processed
- Right now, the only field implemented is “MapAdvice”
 - This field gives advice to support manual mapping decisions between this CrossMap and alternative CrossMaps for the same concept

MapAdvice field values used in current map to ICD9CM

- 1 = one to one
- 2 = narrow to broad
- 3 = broad to narrow
- 4 = partial
- 0 = unmappable

CrossMaps table excerpt

MapSetID	Map ConceptID	Map Option	Map Priority	Map TargetID	Map Rule	Map Advice
100046	27679008	*	*	306056	*	2

* Not currently used
in SNOMED CT

CrossMapTargets

- Each row represents a code or list of codes in the TargetScheme, to which one or more SNOMED concepts is mapped
- In addition, a rule can be given to specify the conditions under which this CrossMapTarget may be used

CrossMapTargets Table

Field	Field Type	Permitted Characters	Length
TargetID	SCTID	Digits from 0-9	6 to 18
TargetSchemeID	String	Any	1 to 64
TargetCodes	String	Any	1 to 255
TargetRule	String	Any	0 to 255
TargetAdvice	String	Any	0 to 255

TargetID and TargetSchemeID each identify the target scheme

Specifying the target code(s)

- TargetID
 - Primary key of table, an SCTID
- TargetSchemeID
 - Standard ID for TargetScheme, such as an HL-7 OID
- TargetCodes
 - Code or list of codes that, taken together, represent the mapping from one or more SNOMED concepts

Specifying a rule to use a particular target

- TargetRule, TargetAdvice
- These fields are under development at this time
 - the TargetRule would be for a machine-processable expression of rules
 - TargetAdvice would have textual advice
- Inclusions and exclusions can be specified in these fields

CrossMapTargets excerpt

TargetID	TargetSchemeID	TargetCodes	TargetRule	TargetAdvice
306056	ISO7963	416.8 278.00	*	*

* Not used in currently distributed map from SNOMED CT to ICD9CM

ICD-9-CM Mapping example

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Gait abnormality \Rightarrow 781.2

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Cross Map Sets Table

MapSetId	MapSetName	MapSetType	MapSetSchemeId	MapSetSchemeName	MapSetSchemeVersion	MapSetRealmId	MapSetUseCaseId	MapSetSeparator	MapSetRuleType
110040	ICD-9-CM Rules Based Map for Reimbursement	4	2.16.840.1.11	International Classification of Diseases and Related Health Problems, 9th Revision, Clinical Modifications	2006		Reimbursement		

Cross Maps Table

MapId	MapSetId	MapConceptId	MapOption	MapPriority	MapGroup	MapTargetId	MapCategory	MapRule	MapAdvice
100067	110040	42377002	1	1	1	100051	31		IFA: barbiturates
101066	110040	42377002	2	2	1	101050	31		IFA: sulfonamides
102060	110040	42377002	3	3	1	102056	12		OTHERWISE
103069	110040	42377002	4	4	2	103053	22		PR:accident
104064	110040	42377002	5	5	2	104055	22		PR:suicide
105063	110040	42377002	6	6	2	105059	22		PR:assault
106062	110040	42377002	7	7	2	106058	22		OTHERWISE

Cross Map Targets Table

TargetId	TargetSchemeId	TargetCodes	TargetRule	TargetAdvice
100051	2.16.840.1.11	967.0		967.0 = poisoning by barbiturates
101050	2.16.840.1.11	961.0		961.0 = poisoning by sulfonamides
102056	2.16.840.1.11	966.3		966.3 = poisoning by other and unspecified anticonvulsants
103053	2.16.840.1.11	E855.0		E855.0 = accidental poisoning by anticonvulsant & etc.
104055	2.16.840.1.11	E950.4		E950.4 = suicide and self-inflicted poisoning & etc.
105059	2.16.840.1.11	E962.0		E962.0 = assault by poisoning with drugs & etc.
106058	2.16.840.1.11	E980.4		E980.4 = Undetermined whether accidentally or purposely inflicted, & etc

SNOMED-to-ICD9CM

Reimbursement Map Categories (draft)

11: Fully classified within ICD-9-CM and may be specific for reimbursement

12: Fully classified within ICD-9-CM and is non-specific

20: Not valid as primary

22: Not valid without additional codes

31: Requires patient characteristics to properly classify but otherwise may be specific for reimbursement

32: Requires patient characteristics to properly classify and is non-specific

0: Outside of the scope of ICD-9-CM, no classification is possible



QUESTIONS



Clinical Vocabulary Mapping Methods Institute
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