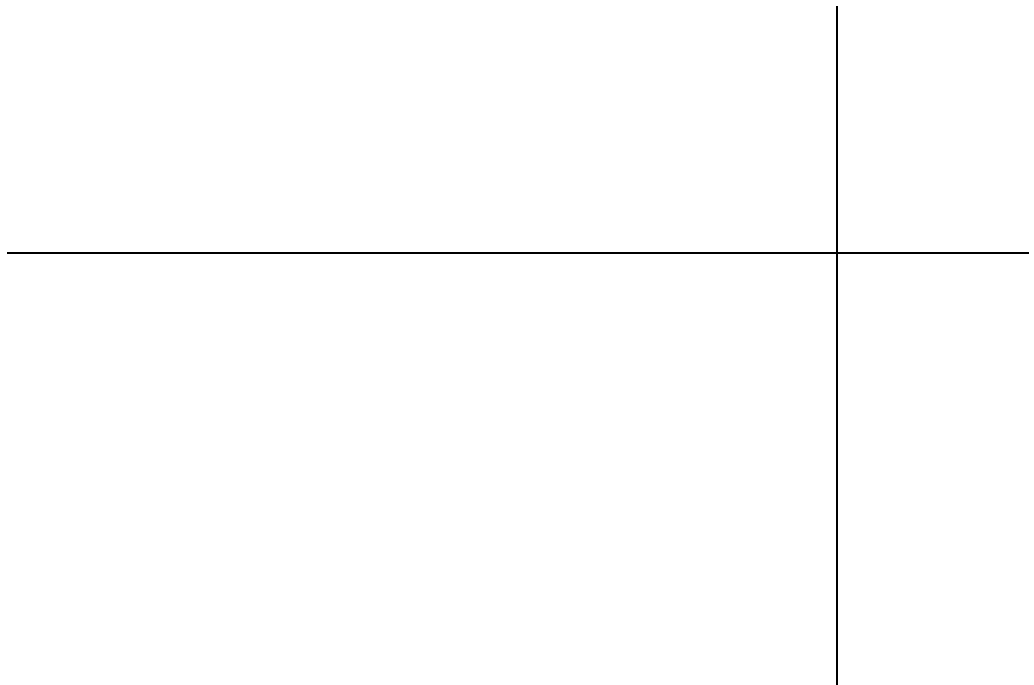


# SNOMED Clinical Terms<sup>®</sup>

## SNOMED CT<sup>®</sup> to ICD-9-CM Rule Based Mapping to Support Reimbursement

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## Document History

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<b>Version</b>	<b>Notes</b>
May 2006	First Publication
June 2009	Comprehensive update to reflect current specifications and status

# 1 Use Case for SNOMED CT® to ICD-9-CM Rule Based Mapping

## 1.1 Business Applications/High Level Description

The integration of a clinical terminology such as SNOMED Clinical Terms® (SNOMED CT®) into electronic health records provides a comprehensive and functional terminology of clinical terms, thus supporting easy transmission of patient-related data between information systems. This mapping of SNOMED CT to the International Classification of Diseases, 9<sup>th</sup> revision, Clinical Modification (ICD-9-CM) is designed to support administrative reporting and reimbursement processes originating with data sets where SNOMED CT is the core terminology for clinical descriptive purposes. It provides a validated concept-based mapping to ICD-9-CM, recognizing that in some selected cases, further processing of ICD-9-CM codes may be required for specialized business applications.

The release of this mapping to ICD-9-CM provides rule-based features in the Cross Map tables. The mapping constitutes the first in a set of knowledge tools which will allow vendor software to create support for semi-automated mapping when a single direct crosswalk from SNOMED CT to ICD-9-CM is not possible due to the complexity of ICD-9-CM coding guidelines. This mapping is an important step towards machine processing of ICD-9-CM coding from SNOMED CT-encoded patient data.

## 1.2 Mapping Purpose

To support semi-automated administrative reporting and reimbursement for health care services within US healthcare organizations.

## 1.3 What It is Not

1. ICD-9-CM codes from this mapping are not optimized for reimbursement in the larger context of the health care enterprise needs. The clinical enterprise employing this mapped data may still require coding support for such billing activities.
2. In the context of mapping of multiple SNOMED CT concepts, this map does not provide for prioritization or ranking of ICD-9-CM codes within such an aggregate.

## 1.4 Audience

The mapping is provided for the benefit of software vendors on the assumption that they will employ this data to create functionality to support semi-automated administrative and reimbursement reporting from the SNOMED CT clinical data record. The community of users is the vendor and information technology community. The community of benefit is the clinicians and the enterprise units with financial and administrative responsibilities.

## 1.5 Applicable Use Case Scenarios

The busy physician keeps clinic records with a computerized system employing SNOMED CT as the core reference terminology. In the course of documenting the encounter, he selects and records reasons for visit and problems using vendor software which are primarily encoded in SNOMED CT. Using this mapping, the EHR vendor provides the functionality to translate the SNOMED-CT encoded data to ICD-9-CM encoded data needed for reimbursement and reporting purposes.

A possible scenario would be when the physician signs off on the clinic visit record, he “drags and drops” a problem from the problem list to the billing record. The mapping supplies ICD-9-CM codes to the billing software which uses the mapped ICD-9-CM codes as part of the encounter data for billing purposes. The vendor software performs cross checking by carrier and billing level to assure best possible reimbursement for the enterprise. The software alerts the physician when the problem selection may be too non-specific for best reimbursement, allowing the physician to consider a more specific problem choice if clinically appropriate.

## 1.6 Scope

The SNOMED CT to ICD-9-CM mapping table is a rule-based cross-reference from SNOMED CT to the ICD-9-CM diagnosis classification system, in which the ICD-9-CM target code or codes that best represent the SNOMED CT concept have been selected, prioritized and assigned. The mapping specifies when complete classification is not supported by ICD or the SNOMED CT concept statement. SNOMED CT concepts that cannot be properly classified with the ICD-9-CM codes for the stated purposes of the mapping are so identified with a separate mapping category.

## 1.7 Source Domains and Context

All current SNOMED CT concepts within the following domains are in scope:

- Clinical finding (finding) [SCTID 404684003]
- Event (event) [SCTID 272379006]
- Situations with explicit context [SCTID 243796009] excluding procedure with explicit context [SCTID 129125009]

It is the assumption of this mapping that SNOMED CT concepts are taken from the context of assessment statements in the clinical record. The purpose of such statements is for a clinician to record a patient disorder or finding, a health finding of pertinence to patient care, or the reason for a clinical encounter. This mapping is intended to have comprehensive source representation of such events.

## 1.8 Target Domain and Context

ICD-9-CM is a classification of diseases and findings for purposes of public health monitoring and epidemiology. The granularity and purpose of ICD-9-CM is not the same as that of SNOMED CT. This mapping assumes that some concepts from SNOMED and some classifications from ICD-9-CM will be out of their shared scope. It is further assumed that ICD-9-CM codes from this mapping will be manually reviewed by the organization using this data prior to employment of the data for reimbursement activities when mapping assignments are so identified.

When required for accurate classification of SNOMED CT content, target ICD-9-CM classification data employed in this mapping include:

1. Classification of diseases
2. E-codes for external causes of injury and poisoning
3. V-codes for patient health status and reasons for provision of health services

## 1.9 Authoritative Resource

SNOMED CT mapping is authenticated using the official version of ICD-9-CM released by U.S. Department of Health and Human Services. Reimbursement specificity is further supported from additional guidelines set forth for inpatient and outpatient settings and is supported by the *ICD-9-CM Official Guidelines for Coding and Reporting* and other publications such as the American Hospital Association's quarterly *Coding Clinic for ICD-9-CM* as appropriate.

Supplemental resources employed include the current editions of:

- Stedman's Electronic Medical Dictionary
- Dorland's Illustrated Medical Dictionary
- Coder's Desk Reference
- Other references as required

## 1.10 Currency and Frequency of Updates

The maintenance and release cycle for the *SNOMED CT to ICD-9-CM Rules Based Mapping to Support Reimbursement* remains to be determined. Once a schedule has been determined by the IHTSDO for the support and distribution of new versions of the cross map, the information will be published on the IHTSDO's Collaborative Workspace and through other appropriate mechanisms.

## 1.11 Distribution Format

The SNOMED CT cross mapping mechanism provides a means to map from clinical concepts in SNOMED CT to codes listed in the target classification (ICD-9-CM). The mapping is distributed as three interrelated Cross Mapping tables:

- Cross Maps Sets Table – identifies the Target Scheme and other characteristics for a cross mapping
- Cross Maps Table – each row contains the identifier for a SNOMED CT concept and represents one option for mapping that concept to a Cross Map Target
- Cross Maps Targets Table – each row table contains the ICD-9-CM Target code(s) that provide as possible mapping for a SNOMED CT concept, along with supplementary information for interpretation and processing

## 2 Technical Procedures and Heuristics

***The following is to provide a high level overview of the mapping guidelines and heuristics applied in the mapping process and mapping table structure.***

The purpose of the mapping is to provide a tool for developers to utilize in computerized records that can then be refined for particular use cases and users in diverse settings. Thus, the mapping guidelines incorporate a mapping approach that does not limit use or the users, but utilizes ICD-9-CM guidelines where appropriate and preserves the granularity and flexibility of terminology. In some instances, ICD-9-CM guidelines cannot be applied in the mapping process because of the inherent differences between the SNOMED CT terminology and the ICD-9-CM classification system and the differences in purpose or uses of each.

### 2.1 General Mapping Approach

Each concept to be mapped is first verified to ensure that it is within scope, and specifically that the concept is a member of one of the source SNOMED CT domains:

- Each concept is reviewed, including the ISA relationships, synonyms, defining attributes, qualifiers and other data which establishes the intended meaning of the concept to the SNOMED modeler.
- A search for the concept is conducted in the official version ICD-9-CM alphabetic index. Standard ICD-9-CM conventions are utilized for index searches.
- Verification of the code assignment is then sought in the tabular listing of ICD-9-CM with full attention to ICD-9-CM tabular conventions such as exclusion and use additional code instructions. An ICD-9-CM encoder is utilized as an assist tool. (Assumptions and heuristics employed in the classification step are enumerated below.)
- If the SNOMED CT concept is out of scope for ICD-9-CM, a map category of 0 is assigned.

For SNOMED CT concepts within ICD-9-CM scope, the map assignment is then made applying the SNOMED CT mapping category assignment definitions and guidelines as set forth below. Concepts which may have multiple alternative mappings based upon requirements for additional patient information such as patient gender, age or context of injury are first analyzed, and map records are created which include mapping rules that identify alternative map targets appropriate for the context restriction.

Next, ICD-9-CM exclusions and restrictions for proposed map targets are checked in the tabular reference. All target ICD-9-CM codes identified with exclusions at the code level have additional map records created which employ rules for selecting a map target when the exclusion applies.

ICD-9-CM designations of “manifestation code” or “code first” restrictions in the tabular publication cause the map to be assigned a category which designates the map target as incomplete.

All source concepts which have no context restrictions or exclusion guidelines will be assigned a map category designating a complete (fully classified) map.



Where such restrictions do apply and when consistent with ICD guidance, a final map target will be chosen and assigned category as default (otherwise true) when restrictionary information is not found in the record.

## 2.2 Key Assumptions

1. The clinical concept is fully specified as stated. Therefore, a source concept such as “Anemia” is assumed to be unspecified and is a logical super-type of many more specific anemias. The exact scope of the sub-types is NOT defined in any external or universal sense. Specific exclusions stated in the ICD-9-CM classification rules may force a specialization which will be reflected in the MAPCATEGORY, MAPADVICE data fields of the CROSSMAPS table.
2. MapGroup is assigned for those concepts in which more than one target ICD-9-CM code is required to fully represent the SNOMED CT concept or to employ the mapping rules. A sequential integer numbering scheme is used beginning with 1 for each target code group and 1 for maps in which no grouping convention is required. Each MapGroup results in one target code being selected.

A single SNOMED CT concept may require one or more targets. More than one ICD-9-CM code may be required to fully classify the SNOMED CT concept, and these will be sequenced using the MapGroups algorithm to denote grouping sequence.

SNOMED CT		Map Option	Map Group	Map Category	Map Advice	TargetCode.
25412000	diabetic retinal microaneurysm (disorder)	1	1	11	Otherwise	250.50 diabetes with ophthalmic manifestations type II or unspecified type
		1	2	11	Otherwise	362.01 background diabetic retinopathy

3. MapOption is a sequential integer numbering scheme that denotes the order of map record processing for consistent mapping results; the row beginning with 1 would be processed first for each group. Each row may include at most one map rule.
4. All SNOMED CT clinical concepts are assumed to be interpreted with a default context for interpretation as follows:
  - a. All Clinical finding 404684003 concepts represent a finding or disorder assumed to be asserted relating to the patient (and not, for example, a family member) unless specified in the concept fully specified name. Situations 243796009 may explicitly revise this assumption.
  - b. All Clinical finding 404684003 concepts are an assertion regarding the current patient state (and not, for example, a past medical history) unless specified in the concept fully specified name.
  - c. The concept assertion is made independent of the observer unless specified in the fully specified name (and so findings made by a nurse, physician, and radiologist or the patient themselves are generally not differentiated).
  - d. The concept is asserted independent of method unless specified in the fully specified name.

- e. The concept is an assertion of itself without unstated or undefined facts. Hence when the map target requires explicit understanding of a related fact or feature and the source concept definition does not include that fact, it is assumed in map of the concept there is “no mention of the fact”.

For example, in mapping: 188725004-Lymphoid Leukemia; the target code classification guideline for “204 Lymphoid leukemia” requires specification of an additional fact:

- Without mention of having achieved remission or failed remission
- In mention of remission
- In relapse

In this case mapping will proceed with the assumption that no mention of remission is explicit in the SNOMED CT concept. The map will be 204.90, with a map category assignment of 11.

### 2.3 Mapping Procedures and Heuristics

- The ICD-9-CM target classification with the highest level of specificity for the code class is always selected. The ICD-9-CM code is selected which most closely reflects the intended meaning of the SNOMED CT concept. In some circumstances, an ICD-9-CM Index entry which appears to be a direct match for a SNOMED CT concept, but is in conflict with the code description in the Tabular List due to semantic discrepancy, is overridden for a more appropriate code selection given the full SNOMED CT concept definition. For example, the ICD-9-CM Index entry for Polyp, gallbladder is code 575.6, *Cholesterolosis of gallbladder*. However, the SNOMED CT concept, Polyp of gallbladder was matched to code 575.8, *Other specified disorders of gallbladder*, because it was considered to be a better representation of the concept.
- The mapping category is assigned that best represents the mapping relationship between the SNOMED CT concept and the target code utilizing the category guidelines. Clinical findings that are not explicitly described as physiologically abnormal will be considered out of scope and assigned map category 0. Modifying terms such as “increased”, “elevated”, “decreased” or “diminished” will be assumed to denote an abnormality. However “increasing”, decreasing”, “lower” or “higher” do not specify an abnormality and will be considered out of scope and assigned map category 0 as of uncertain significance.
- When the source concept to be mapped is a Clinical Finding 404684003 and ICD-9-CM has map target classifications which may represent both findings (symptomatic) and disorder-based coding, the SNOMED CT assignment as disorder or finding will guide the map selection. For example, in mapping Respiratory insufficiency (disorder) 409623005; map target 518.82 Disease of lung: other pulmonary insufficiency will be chosen in preference to 786.09 Symptoms involving respiratory system: Respiratory insufficiency. This map will reflect the definition of the source concept as a disorder.
- Acquired versus congenital: when a SNOMED concept is not specific to acquired or congenital but ICD-9-CM makes a distinction and a discreet code is available to represent acquired and congenital conditions, both code choices will be represented as ifa statements and there will be no default map.

- Adverse Effects: it is assumed that adverse effects or reactions refer to the drug identified and that the drug has been administered correctly within an appropriate plan of care. No assertions will be employed in the map regarding appropriateness or context of drug treatment except as provided in the SNOMED definition.
- Neoplasms:
  - **Malignant Neoplasm:** SNOMED CT concept statements that do not make specific assertions as the primary or metastatic nature of a malignancy will be assumed to be primary and so classified within ICD.
  - **Carcinoma in Situ:** concepts with a statement of “carcinoma in situ” will be mapped to ICD-9-CM categories for carcinoma in situ: this includes concepts that include descriptors such as intraepithelial, non-infiltrative, noninvasive, and pre-invasive carcinoma. They should be considered “Carcinoma in Situ” by definition in ICD, but must be confirmed by SNOMED CT defining relationships.
  - **Neoplasms:** when it is not specified if a neoplasm is malignant or benign, (neither the behavior nor the morphology is specified in the SNOMED CT concept definition) and clinical references do not specify behavior characteristic of the morphology finding, the concept will be mapped to the category of neoplasm of unspecified nature in ICD.
- Supplementary Classification of External Causes of Injury and Poisoning target codes (“E” codes) are utilized in the mapping to represent concepts from the event hierarchy that describe external causes of injuries and poisoning utilizing the following guidelines:
  - **Injury**
    - Whereas the injury and its means or cause is identified and specified in the concept then the appropriate ICD-9-CM target injury code(s) is applied as well as the appropriate E target code(s) and the appropriate map category assigned following mapping category guidelines.
    - If the injury is asserted in the SNOMED concept, but the type of injury is not specified in the concept, but only the external cause is specified then the appropriate E target code that best describes the external cause is assigned secondary to the general injury code (959.9) the appropriate map category is assigned following mapping category guidelines.
    - Multiple E-codes may be assigned as necessary to fully describe each cause as described within the SNOMED CT concept.
  - **Poisoning and Adverse Effect**
    - Appropriate E-codes are assigned for all drug treatments that result in a poisoning or adverse effect of drugs as described within the SNOMED CT concept.

A Poisoning Rule (PR) and a MapGroup rule algorithm is used to select E codes when a concept states poisoning but does not state the cause or intent of the poisoning. An example in which the intent is not stated: Concept 241754000 poisoning by sodium valproate mapped to 966.3 and the PR rule would require the user based on patient information to select the appropriate E code.

SNOMED CT		Map Option	Map Group	Map Category	Map Advice	TargetCode
241754000	poisoning by sodium valproate	1	1	31	IFA: barbiturates	967.0 barbiturates
		2	1	31	IFA: sulfonamides	961.0 sulfonamides
		3	1	11	otherwise	966.3 other and unspecified anticonvulsants
		1	2	22	PR:accident	E855.0 anticonvulsant and anti-Parkinsonism drugs
		2	2	22	PR:suicide	E950.4 other specified drugs or medicinal substances
		3	2	22	PR:assault	E962.0 drugs and medicinal substances
		4	2	22	Otherwise	E980.4 other specified drug or medicinal substance

- Supplementary Classifications of Factors Influencing Health Status and Contact with Health Services (“V” codes) are assigned to appropriate SNOMED CT context dependent categories.

## 2.4 Category Assignment Definitions

Broad study has demonstrated that the volume and granularity of SNOMED CT exceeds that of ICD-9-CM. SNOMED CT is a pragmatically engineered clinical terminology that does not seek to pre-coordinate all possible concepts. Instead the scope of SNOMED CT is designed to assure completeness of clinical description. Therefore, although most SNOMED CT concepts within the scope of the mapping can be classified within ICD-9-CM, this is not universally true. In order to support the use cases and provide the vendor with accurate data regarding the map, each SNOMED CT-ICD-9-CM target map is assigned a category (CROSS MAPS table, field MAP CATEGORY) within the following scheme:

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

SNOMED CT		Map Option	Map Group	Map Category	Map Advice	TargetCode
167450007	Urine protein normal (finding)	1	1	0	Otherwise	

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

The SNOMED CT concept is properly represented within the realm of the target ICD-9-CM codes presented. No additional information or data is required regarding the patient (age, sex, additional diagnoses or findings) to verify that this mapping is correct. The authoritative reference has no flags indicating this is a unspecified code.

This category specifically excludes SNOMED CT concepts which are represented by ICD-9-CM codes for which “exclusion notes” or guidelines are noted in the ICD-9-CM code set (See category 12).

SNOMED CT		Map Option	Map Group	Map Category	Map Advice	TargetCode.
20897003	atrophy of breast	1	1	11	Otherwise	611.4 atrophy of breast

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

All category 1X ICD-9-CM assignments which are annotated in the authoritative source as “Unspecified code” are assigned to category 12.

SNOMED CT		Map Option	Map Group	Map Category	Map Advice	TargetCode
78623009	endometritis	1	1	12	Otherwise	615.9 unspecified inflammatory disease of uterus

### Category 20: Code first underlying disease

This SNOMED CT concept is fully classified but the ICD-9-CM code is referenced in the authoritative source as a manifestation code, or code first underlying disease, disorder or condition.

SNOMED CT		Map Option	Map Group	Map Category	Map Advice	TargetCode
21818003	cataract in degenerative disorder	1	1	20	UAC	366.34 cataract in degenerative disorders

### Category 22: Not valid without additional codes

SNOMED CT concepts which are properly classified, but require additional ICD code(s) from the Disease Classification for nature of injury or are intended to represent the adverse effect, are assigned category 22.

SNOMED CT		Map Option	Map Group	Map Category	Map Advice	TargetCode
40785002	car crash	1	1	22	Otherwise	E988.5 crashing of motor vehicle
230354009	drug-induced encephalopathy	1	1	22	ECR	349.82 toxic encephalopathy

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

The SNOMED CT concept may have multiple map target code sets and cannot be classified without additional patient data (examples include age, sex, or co-morbid diseases or findings). All ICD-9-CM codes in the tabular index of the authoritative source found in exclusion statements or associated with age and sex specification requirements will be classified as type 3X. When none of the exclusions apply the default map has map category 0, 11, 12, 20, or 22.

This target map is not labeled as “Unspecified” in the authoritative resource, and may be used for reimbursement if MAPADVICE data indicates the applicability of this code for the patient.

SNOMED CT		Map Option	Map Group	Map Category	Map Advice	TargetCode
91221002	furuncle of abdominal wall	1	1	31	IFA buttocks	680.5 carbuncle and furuncle buttocks
		2	1	31	IFA external genital organs female	616.4 other abscess of vulva
		3	1	31	IFA other inflammatory disorders of penis	607.2 other inflammatory disorders of penis
		4	1	31	IFA other inflammatory disorder of male genital organs	608.4 other inflammatory disorder of male genital organs
		5	1	11	Otherwise	680.2 other cellulitis and abscess of face

In cases where the exclusion note in the authoritative source results in non-specific or ambiguous concepts then a TargetCode of “ ” (NULL) is provided.

SNOMED CT		Map Option	Map Group	Map Category	Map Advice	TargetCode
93463007	generalized macrodontia	1	1	31	IFA:that due to congenital syphilis	090.5 other late congenital syphilis symptomatic
		2	1	31	IFA:tuberculum Carabelli, which is regarded as a normal variation	
		3	1	11	Otherwise	520.2 abnormalities of size and form

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

Multiple category 31 or 32 maps for a single SNOMED CT concept will have associated MAPADVICE data which allows vendor software to reliably choose between the category 3x maps. The options for MAPADVICE algorithmic data are listed below.

SNOMED CT		Map Option	Map Group	Map Category	Map Advice	TargetCode
297106006	primary infertility	1	1	32	GAMR:F	628.9- Female infertility unspecified
297106006	primary infertility	2	1	32	GAMR:M	606.9- Male infertility unspecified
		3	1	0	Otherwise	

When gender or congenital origin is required for mapping, maps for category 3X may have conditions which cause the target to become undefined or outside of scope. In such a case, a target code of "" (NULL) is provided as in the example above.

## 2.5 Cross Maps Table: Rule Acronyms

The MapAdvice field contains algorithmic data which supports vendor processing and selection of alternative ICD-9-CM map records. These are presented as rule acronyms which will support semi-automated rule-based mapping. For any given map group only a single rule acronym will be applied. The inclusive list of rule acronyms includes:

### ECR (external cause required)

Employed only for category 22 map records, this notation accompanies a map to a drug-related disorder code which requires an additional E-code to further describe the circumstance of the drug incident and the needed information is not specified in the source concept.

SNOMED CT		Map Option	Map Group	Map Category	Map Advice	TargetCode
237539004	drug-induced thyroiditis	1	1	22	ECR	245.4 iatrogenic thyroiditis

### UAC (use additional code)

Employed for categories 20 and 22, this is employed when the ICD category is referenced as a manifestation code, or there is a notation to code first underlying disease, disorder or condition. Use Additional Code (UAC) is applied to any map in which ICD instructs to "Use additional code" or "Code first" at the valid code level.

SNOMED CT		Map Option	Map Group	Map Category	Map Advice	TargetCode
21818003	cataract in degenerative disorder	1	1	20	UAC	366.34 cataract in degenerative disorders

**GAMR (gender age map rule)**

Employed in category 31 and 32 maps. If gender or age is a determining factor in choosing the correct code this acronym is used. A structured format is provided to support machine processing. The format will be “GAMR:(M/F); (Age range). For example, the acronym “GAMR:M;15-124” specifies that the map should only be employed for males between the age of 15 and 124.

SNOMED CT		Map Option	Map Group	Map Category	Map Advice	TargetCode
242044009	abuse of disabled person	1	1	31	GAMR; 15-124;	995.80 adult maltreatment unspecified
		2	1	31	GAMR; 0-15	995.50 child abuse unspecified
		3	1	0	Otherwise	

**IFA (If a)**

These rule acronyms are generally employed in category 22, 31 and 32 maps whenever the ICD-9 classification includes an exclusion condition asserted at the valid ICD code level. Each exclusion rule is meant to be evaluated in numbered (Map Option) order. The rules are textual and advisory in nature. The exclusion rules in this release are not suitable for computer evaluation, but are meant for employment by vendor software to list ICD-9-CM options for the user at the time of classification of a SNOMED concept. In a future release, these rules may be enhanced; first, to eliminate guidelines where ICD exclusions contradict the context of the SNOMED concept, and secondly, to refine and map the rules to SNOMED CT. At that time, computer evaluation of rules may become a possibility for vendor implementation

**PR (poisoning rule)**

Employed for concepts which state poisoning however the cause or intent is not stated. The PR rule acronym would require the user based on patient information to select the appropriate E code based on the following rule algorithm. In this algorithm the default map “otherwise” is equivalent to “undetermined” in the authoritative source.

SNOMED CT		Map Option	Map Group	Map Category	Map Advice	TargetCode
241914006	photographic material causing toxic effect	1	1	11	Otherwise	989.89 other
		1	2	22	PR:accident	E866.8 Other specified solid or liquids substances
		2	2	22	PR:suicide	E950.9 other and unspecified solid and liquid substances
		3	2	22	PR:assault	E962.1 other solid and liquid substances
		4	2	22	Otherwise	E980.9 undetermined other and unspecified solid and liquid substances



## Otherwise

Employed in all maps in which no other rules or exclusion conditions apply. This is the default map and maybe used in categories 0, 11, 12, and 22.

## 2.6 Application of ICD-9-CM conventions and guidelines

The following ICD-9-CM conventions are considered in the target code selection:

- **ICD-9-CM Instructional notes:** ICD-9-CM conventions are utilized as described in the official version for instructional notes.
- **General notes:** the convention is used as it may apply to mapping of diseases or disorders: Of note when a SNOMED CT concept “fracture of x” is neither specified as closed or open then the ICD-9-CM classification is assumed to be a closed (simple) fracture.
- **Inclusion notes:** if a SNOMED CT concept is found to be present in the inclusion statement for a specific ICD-9-CM class, then the SNOMED CT concept is mapped
- **Exclusion notes:** Exclusions notes in ICD-9-CM are represented in this release by rule-based mapping. Exclusion notes may be found in the authoritative source at the code, subsection or chapter level. All exclusions are included for rule maps which were published at the valid code level. If a code expands to five-digits, a five-digit code is the valid code. Similarly, for codes that expand only to a third- or fourth-digit level, the valid code is three or four digits, respectively. In some particularly useful cases, excludes notes appearing at the category (3 digit) and subcategory (4 digit) levels for portions of ICD-9-CM in which a common set of 5th digit codes apply (e.g., diabetes mellitus, pregnancy-related conditions and head injury) are also captured by the rule-based mapping.

Exclusionary statements found in the authoritative resource are enumerated as alternative category 31 or 32 map records. For each excluded condition, a new map target record is created and a map rule is created in the CROSS MAP table which employs an IFA rule acronym specifying the excluded condition. In this map release, the condition is specified in plain text accompanied by the applicable ICD code range or a default code(s). In a future release, this plain text will be replaced by a fully specified SNOMED CT code in order to support automated context sensitive mapping.

- **Use additional code:** the ICD-9-CM convention which directs that another code may be required to provide a complete representation of the disease or disorder is applied. In mapping a SNOMED CT concept this convention is applied ONLY when the SNOMED CT description as stated subsumes the meaning of the additional code. These maps may be classified as category 1x, 2x or 3x.
- **Code first underlying disease:** this ICD-9-CM convention is applied in the mapping when the underlying disease is specified in the SNOMED CT concept. These maps are assigned map category 1x, 2x or 3x. Additionally, when the underlying disease is not specified in the SNOMED concept and the ICD code is referenced as a manifestation code, or there is a notation to code first underlying disease, disorder or condition, rule acronym UAC will be utilized.
- **ICD-9-CM cross-referencing conventions:** “see” and “see also” category is applied as directed by ICD-9-CM convention.

### 3 Technical Reference Documentation

The following updates have been made to the Cross Mapping mechanism table structures in order to support this mapping. These changes have not been officially approved by the IHTSDO, but are expected to be incorporated into future specification of the Cross Mapping mechanism, which are currently under development.

- **Cross Map Sets Table**

- New Data Field: MapSetUseCaseID – This field distinguishes multiple mappings between SNOMED CT and the same Target Scheme; it was not added for this Use Case

- **Cross Maps Table**

- New Key Field: MapID – This field has been proposed as an improvement to the Cross Maps structure; added for this Use Case
- New Data Field: MapGroup – Added for this Use Case
- New Data Field: MapCategory - Added for this Use Case

- **Targets Table**

- No changes

### 3.1 Cross Map Sets Table

Each row in the Cross Map Sets Table identifies a Target Scheme and use case to which SNOMED CT is mapped and specifies characteristics of the associated Cross Maps and Cross Map Targets.

#### ***Cross Map Sets Table***

Key Fields	Field Type	Permitted Characters	Length	Description
MapSetID	SCTID	0 to 9	6 to 18	The unique SNOMED CT Identifier for this Cross Map Set.
MapSetName	String	Any (except LF, CR and TAB)	1 to 255	A descriptive name given to the Cross Map Set by its originator.
MapSetType	Enumerated	0 to 9	1 to 2	Indicates the nature of the Cross Maps associated with this scheme. CrossMapType is used to indicate the inclusion of one-to-one, one- to-many and choices of maps. Values 0 Unspecified. 1 Single - All maps are unique one-to-one maps. <ul style="list-style-type: none"> <li>Each concept has only one associated Cross Map</li> <li>Each Cross Map Target contains a single Target Code.</li> </ul> 2 Multiple - Some maps are one-to-many maps but there are no choices. <ul style="list-style-type: none"> <li>Each concept has only one associated Cross Map</li> <li>Some Cross Map Targets contains a list of more than one Target Code.</li> </ul> 3 Choice - Some maps include choices of one-to-one maps but there are no one-to-many maps. <ul style="list-style-type: none"> <li>Some concepts have more than one associated Cross Map</li> <li>Each Cross Map Target contains a single Target Code.</li> </ul> 4 Flexible - Some maps include choices and there are some one-to-many maps. <ul style="list-style-type: none"> <li>Some concepts have more than one associated Cross Map</li> </ul> Some Cross Map Targets contain a list of more than one Target Code.
MapSetSchemeID	String	Any (except LF, CR and TAB)	1 to 64	A standard identifier for the Target Scheme. This may be an International Coding Scheme Identifier (ISO7826) or an Object Identifier (OID) used as specified by HL7.
MapSetSchemeName	String	Any (except LF, CR and TAB)	1 to 255	The full name of the Target Scheme.
MapSetSchemeVersion	String	Any (except LF, CR and TAB)	1 to 12	The version number of the Target Scheme as published by the issuing organization.

Key Fields	Field Type	Permitted Characters	Length	Description
MapSetRealmID	String	Any (except LF, CR and TAB)	1 to 24	<p>A string identifying a Realm within which this mapping table is applicable. This is only used in cases where Realm specific business rules or guidelines alter the acceptable mappings.</p> <p>Realm is the same as used in the Subsets Table. It includes a four character ISO6523 identifier followed by an optional series of concatenated subdivision codes defined by the registered organization.</p> <p><b>Example:</b> The EDI identifier scheme used by the NHS. The "0080" is the ISO6523 identifier for the NHS. Trusts, Health Authorities, GP practices are issued with a ten-digit identifier and are permitted to issue subdivision codes of up to five digits in length. This results in a 19-digit string.</p> <p><b>Usage:</b> This is only used in cases where Realm specific business rules or guidelines alter the acceptable mappings. In all other cases the RealmID has the value "0" (zero) and should be ignored.</p>
MapSetUseCaseID	String	Any (except LF, CR, TAB)	1 to 24	<p><b>NEW DATA FIELD</b> A label or identifier of the Use Case within which this mapping table is applicable.</p>
MapSetSeparator	String	Any (except LF, CR and TAB)	1	The character used as a separator between the individual codes in the Target Codes field of the Cross Map Targets.
MapSetRuleType	Enumerated	0 to 9	1	<p>An indication of the types of rules used in the Cross Maps and Cross Map Targets.</p> <p>This discussion of rules is included although rules are not yet used in the released SNOMED CT Cross Maps. However, this feature may be of interest to implementers.</p>

### 3.2 Cross Maps Table

Each row in the Cross Maps Table represents one option for mapping a concept to a Cross Map Target. If there are several alternative Cross Maps for a concept:

- Each option is represented by a row in the Cross Maps Table.
- Each row may include rules for choosing that option
- The rules for choosing an option may be expressed as:
  - Machine-processable instructions
  - Textual advice to support manual coding
  - Both of the above

#### **Cross Maps Table**

Key Fields	Field Type	Permitted Characters	Length	Description
MapID	SCTID	0 to 9	6 to 18	<b>NEW KEY FIELD</b> The unique SNOMED CT Identifier for each row in the Cross Maps table. Unique SNOMED CT Identifier for this Cross Map Set.
MapSetID	SCTID	0 to 9	6 to 18	The unique SNOMED CT Identifier for the Cross Map Set of which this Cross Map is a member.
MapConceptID	SCTID	0 to 9	6 to 18	The SNOMED CT Identifier of the mapped Concept.
MapOption	Integer	0 to 9	1 to 5	An integer that distinguishes between alternative mappings for a single concept. If automatic rules are used to determine which option is applicable, the Cross Map with the lowest MapOption value is tested first.
MapGroup	Integer	0 to 9	1 to 5	<b>NEW DATA FIELD</b> An integer that distinguishes one group of mappings from another. The rows with the lowest group number should be evaluated first.
MapPriority	Integer	0 to 9	1 to 5	Indication of the suggested order in which to present a series of options for mapping a concept for manual assessment. The last of these is the default option in each map group for mapping the Concept.
MapTargetID	SCTID	0 to 9	6 to 18	The unique SNOMED CT Identifier for a Cross Map Target to which this concept can be mapped.
MapCategory	Integer	0 to 9	1 to 5	<b>NEW DATA FIELD</b> The information intended to be stored in the MapCategory field is a numeric value that indicates the type of Cross Map. Note: The meaning of the value contained in this field is described in the documentation for each mapping.
MapRule	String	Any (except LF, CR and TAB)	0 to 255	A machine-processable expression that determines whether this is an appropriate Cross Map. Note: The meaning of this field is described in the documentation of each mapping.
MapAdvice	String	Any (except LF, CR and TAB)	0 to 255	Textual advice to support manual mapping decisions between this Cross Map and other alternative Cross Maps for mapping the same concept.

### 3.3 Cross Map Targets Table

Each row in this table represents a code or set of codes in the Target Scheme, which provides a mapping for one or more SNOMED CT concepts. A Cross Map Target may include a rule indicating the conditions in which it applies.

#### ***Cross Map Targets Table***

Key Fields	Field Type	Permitted Characters	Length	Description
TargetID	SCTID	0 to 9	6 to 18	The unique SNOMED CT Identifier for the Cross Map Set of which this Cross Map is a member.
TargetSchemeID	String	Any (except LF, CR and TAB)	1 to 64	A standard identifier for the coding scheme in which the TargetCodes are expressed. This may be an International Coding Scheme Identifier (ISO7826) or an Object Identifier (OID) used as specified by HL7. Note: The value of this field must be the same as the MapSetSchemeID of any Cross Map Set that includes Cross Maps referring to this Cross Map Target.
TargetCodes	String	Any (except LF, CR and TAB)	1 to 255	A code or list of codes in the Target Scheme that together represent an appropriate mapping for one or more concepts. If more than one code is included: <ul style="list-style-type: none"> <li>• A separator character specified in the Cross Map Sets Table is used to separate the codes.</li> <li>• The mapping is to the combination of all the codes in the list.</li> <li>• This field may be null if no target codes apply to this cross map.</li> </ul>
TargetRule	String	Any (except LF, CR and TAB)	0 to 255	A machine processable expression of rules that determine the combinations of conditions to which this Cross Map Target applies. Note: The form of expression used for these rules depends on the Map Set Rule Type.
TargetAdvice	String	Any (except LF, CR and TAB)	0 to 255	Textual advice expressing the combinations of conditions to which this Cross Map Target applies.

## 4 Appendix

### 4.1 Quality Assurance Checks

The following Quality Assurance (QA) checks are embedded in the mapping process for the SNOMED CT-ICD-9-CM Reimbursement Map.

#### 4.1.1 Run-time Quality Assurance Checks

The following table lists the Quality Assurance (QA) checks that are performed at the time mappings are saved.

Class of QA Check	Details
<p><b>Rule Acronym QA</b> The mapping tool takes care of data entry issues (i.e. makes sure the rule acronym used is a valid acronym and is keyed in correctly) by limiting choices to a fixed list of valid acronyms.</p>	<ul style="list-style-type: none"> <li>• Rule acronym = CFUD is not a valid Rule acronym .</li> <li>• Rule acronym= ICR is not a valid Rule acronym .</li> <li>• Rule acronym cannot begin or end with a quotation mark.</li> <li>• Valid Rule acronyms prefixes are {ECR, UAC, GAMR, PR, OTHERWISE, IFA}.</li> </ul>
<p><b>Map Category QA</b> The mapping tool:</p> <ul style="list-style-type: none"> <li>• Prevents the use of invalid map categories by limiting data entry to a fixed list.</li> <li>• Enforces the relationships between rule acronym and category by running specially programmed rules each time a mapping is saved. Mappings that are invalid according to the guidelines opposite are rejected a run-time, and have to be corrected by the mapper.</li> </ul>	<ul style="list-style-type: none"> <li>• Rule/Category checks: <ul style="list-style-type: none"> <li>○ Rule acronym= ECR can only have a Map Category = 22.</li> <li>○ Rule acronym= UAC can only have a Map Category = 20 or 22.</li> <li>○ Rule acronym= GAMR can only have a Map Category = 31 or 32.</li> <li>○ Rule acronym= PR can only have a Map Category = 22.</li> <li>○ Rule acronym= OTHERWISE can only have a Map Category = 11, 12, 22, or 0.</li> <li>○ Rule acronym= IFA can only have a Map Category = 31, 32, 0, or 22.</li> </ul> </li> <li>• The only valid Map Categories are {0, 11, 12, 20, 22, 31, 32}</li> <li>• If Map Category = 0, Target Code must be null (unmappable).</li> <li>• E-codes always have a Map Category = 22</li> </ul>
<p><b>Target Code QA</b> The mapping tool ensures that only valid target codes are used, by restricting the mapper to selecting a code from a list of valid codes.</p>	<ul style="list-style-type: none"> <li>• The only valid target codes are contained in the latest release of ICD-9 except Null, which represents an unmappable concept.</li> </ul>
<p><b>Map Group QA</b> The mapping tool ensures the integrity of the rule-based-map structure by running special program code each time a mapping is saved.</p>	<ul style="list-style-type: none"> <li>• The same map rule cannot exist more than once in the same Map Group.</li> <li>• No duplicate rows are allowed within Map Groups.</li> </ul>

### 4.1.2 Post-processing Quality Assurance Checks

The following table lists the QA checks that are performed on a map release as a whole to ensure the integrity of all the mappings that constitute the release.

Details
<ul style="list-style-type: none"><li>• Any .9, .8, .0 that is not a 32 or 12 should be reviewed.</li><li>• A target code cannot be assigned different categories in different mappings, except the Unmappable target code.</li><li>• Default target codes for equivalence map should be the same default target codes for the rule-based map and vice versa.</li><li>• You cannot repeat default target codes for a map concept ID.</li><li>• All Map Groups must have one and only one default code.</li><li>• Ensure that the SNOMED CT concepts represented in the map are in scope as described in section 1.7 above.</li></ul>