New concept proposal

Tumor Grade Assessment Event, Tumor Grade Assessment

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Dataset release	2024.1	**Consulted expert**	-

1 Change request input / rationale

Multiple specifications exist for tumor grading, and the current version of the Tumor Grade concept cannot hold any information about which system is used.Therefore, it is suggested to deprecate the present Tumor Grade concept and replace it by the newly proposed concepts Tumor Grade Assessment Event and Tumor Grade Assessment.

2 Comparison to other standards/data models

2.1 NCI Thesaurus

NCIT has codes to express the grade of the tumour in an ordinal scale:

- Grade B (neoplasm of borderline malignancy)
- Grade X (cannot be assessed)
- High Grade
- Highest Grade
- Intermediate Grade
- Low Grade
- Lowest Grade
- Moderately Differentiated
- Poorly Differentiated
- Undifferentiated

- Well Differentiated

All these codes are children of Histologic Grade (Code C18000). The coding systems, however, are not listed under the same direct parent codes. Available grading system codes are:

- Broder's Grading System
- Mandard Grading System
- Simpson Grading System
- Huvos Grading System
- Gleason Grading System
- Scarff-Bloom-Richardson Grading System
- WHO Follicular Lymphoma Histologic Grading System
- Sarcoma by FNCLCC Grade
- Nottingham Grade
- European Consensus on Grading of Bone Marrow Fibrosis
- Nottingham Score

Alternatively to the mentioned ordinal grading scales, some, but not all, of the coding systems have their possible values as children concepts. That is, for instance the case of Nottingham Grade (Notthingam Grade 1, Notthingam Grade 2, Notthingam Grade 3).

2.2 SNOMED CT

SNOMED CT holds codes for the grading systems as children of concept 277457005, Histological grading systems (staging scale).

- Daumas-Duport grading system (staging scale)
- French Federation of Cancer Centers Sarcoma Group grading system (staging scale)
- Fuhrman nuclear grading system (staging scale)
- Gleason grading system for prostatic cancer (staging scale)
- Gleason scoring system for malignant neoplasm of prostate (staging scale)
- International Society of Urologic Pathology prostate cancer staging system (staging scale)
- National Cancer Institute histologic grading system (staging scale)
- Nottingham histologic grading system (staging scale)
- World Health Organization and International Society of Urological Pathology grading system for renal cell carcinoma (staging scale)
- World Health Organization and International Society of Urological Pathology grading system for urothelial neoplasm (staging scale)
- World Health Organization central nervous system tumor grading system (staging scale)
- World Health Organization classification of tumors histologic grading system (staging scale)

Concerning the values of the grade itself, SNOMED CT provides the scale Tumor Grade G0, G1, G2, G3, G4 and another scale specific to the WHO central nervous system tumour grading system (the grades are WHO grade I, II, III, IV)

3 Change content

3.1 Currently released concept

Concept or concept compositions or inherited	General concept name	General description	Contextualized concept name	Contextualized description	Type	Standard	Value set or subset	Meaning binding
concept	Tumor Grade	growth extent of the tumor and how far the tumor has spread	Tumor Grade	growth extent of the tumor and how far the tumor has spread				SNOMED CT: 373372005 |Histological grade finding (finding)|; LOINC: 21858-6 Grade Cancer
composedOf	code	code, name, coding system and version describing the concept	code	code, name, coding system and version used to assess the tumor grade with TNM or other grading system	Code			
composedOf	assessment datetime	datetime at which the concept was assessed	assessment datetime	datetime at which the grading was assessed	temporal			

3.2 Proposed new concept Tumor Grade Assessment

Concept or concept compositions or inherited	General concept name	General description	Contextualized concept name	Contextualized description	Type	Standard & Value set or subset	Meaning binding	Cardinalities
Concept	Tumor Grade Assessment	grading system used to assess the differentiation of the tumor cells based on histology	Tumor Grade Assessment	grading system used to assess the differentiation of the tumor cells based on histology	Assessment		LOINC: 21858-6 Grade Cancer; SNOMED CT: 277457005 | Histological grading systems (staging scale) |	
inherited	code	coded information specifying the concept	grading system	coded information specifying the tumor grade assessment	Code	SNOMED CT descendant of: 277457005 | Histological grading systems (staging scale) |		0:1
inherited	name	name associated to the concept	name	name associated to the tumor grade assessment	string			0:1
inherited	component	part of the concept	component	part of the tumor grade assessment	Assessment Component			0:n
inherited	result	evaluation outcome associated to the concept	result	evaluation outcome associated to the tumor grade assessment	Result	code restricted to: 138875005 |SNOMED CT Concept (SNOMED RT+CTV3)|		0:1[1]

[1] The assessment (not the component) should link to maximum one result, which represents the “total” result. If more than one result is available, assessment components should be instantiated.

3.3 Proposed new concept Tumor Grade Assessment Event

Concept or concept compositions or inherited	General concept name	General description	Contextualized concept name	Contextualized description	Type	Standard and Value set or subset	Meaning binding	Cardinalities
Concept	Tumor Grade Assessment Event	evaluation of the tumor grade at a given time, which takes into account a predefined grading system	Tumor Grade Assessment Event	evaluation of the tumor grade at a given time, which takes into account a predefined grading system	Assessment Event			
inherited	assessment	evaluation tool associated to the concept	assessment	evaluation tool associated to the tumor grade assessment event	Tumor Grade Assessment			1:1
inherited	datetime	datetime of the concept	datetime	datetime when the tumor grade assessment event was performed	temporal			1:1
inherited	performer	type of person who performs or reports the concept	performer	type of person who performs or reports the tumor grade assessment event	Performer			0:1

General concept name	Cardinality for concept to Administrative Case	Cardinality for concept to Data Provider Institute	Cardinality for concept to Subject Pseudo Identifier	Cardinality for concept to Source System
Tumor Grade Assessment	0:1	1:1	1:1	1:1
Tumor Grade Assessment Event	0:1	1:1	1:1	1:1

4 Impact on SPHN Dataset

The concept of Tumor Grade will be deprecated and replaced by the concepts Tumor Grade Assessment Event and the Tumor Grade Assessment.

5 Discussion

5.1 Value set of result code

A value set restriction is not possible because it depends on the staging system to use. If SNOMED CT provides codes, use them instead of general qualifiers. Otherwise, SNOMED CT provides generic grades in the descendants of 258349007 | Grades (qualifier value) |. For instance, if you use the Gleason grading system, use 46677009 | Gleason grade score 3 out of 10 (finding) |; if you use another system that has no specific codes made available in SNOMED CT, use 258353009 | Grade 3 (qualifier value) |.

5.2 Meaning bindings

There were two candidates for meaning binding: SNOMED CT: 371469007 | Histologic grade of neoplasm (observable entity) | and SNOMED CT: 373372005 |Histological grade finding (finding)|, but neither are the descendants of 273249006 | Assessment scales (assessment scale) | nor 386053000 | Evaluation procedure (procedure) |, which are the respective meaning bindings of Assessment and Assessment Event.

6 Example

Tumor Grade Assessment Event

assessment:
- code (grading system):
  - identifier: 427196009
  - name: National Cancer Institute histologic grading system (staging scale)
  - system name and version : SNOMED-CT-2023-03-10
- name: -
- component: -
- result:
  - code:
    - identifier : 258353009
    - name : Grade 3 (qualifier value)
    - system name and version : SNOMED-CT-2023-03-10

datetime: 2018-07-01

performer:
- code:
  - identifier: 81464008
  - name: Clinical pathologist (occupation)
  - system name and version: SNOMED-CT-2023-10-01