New concept proposal

Imaging Procedure

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Dataset release	2024.1	**Consulted expert**	Edwin ter Voert

1 Rationale

The current Diagnostic Radiological Examination concept present in the core dataset (release 2023.2) refers to the radiographic examinations used for a diagnostic purpose. As creating a more general concept including all types of radiological procedures, such as MRI and ultrasound, and other types of imaging, necessitates too many breaking changes, it was decided that a new concept was needed entirely. To include all imaging procedures, it would be necessary to allow the use of SNOMED CT for a more complete coverage of imaging procedures, as CHOP is incomplete and poorly hierarchized.

2 Comparison to other standards/data models

2.1 SNOMED CT

A restrained value set would be sufficient - descendants of : 363679005 |Imaging (procedure)|

2.2 CHOP

An unrestrained value set for CHOP codes would enable inclusion of missing codes for non-radiographic procedures such as ultrasounds and MRIs. However, this was rejected for reasons detailed in the discussion section.

3 Concept information

Concept or concept compositions or inherited	General concept name	General description	Contextualized concept name	Contextualized description	Type	Standard	Value set or subset	Meaning binding	Cardinality for composedOf
concept	Imaging Procedure	imaging procedure used for examination of a body site or function	Imaging Procedure	imaging procedure used for examination of a body site or function	Medical Procedure			SNOMED CT:363679005 |Imaging (procedure)|	
inherited	code	coded information specifying the concept	code	coded information specifying the procedure type for the imaging procedure	Code	SNOMED CT	descendant of : 363679005 |Imaging (procedure)|		1:n
inherited	start datetime	datetime at which the concept started	start datetime	datetime the procedure started	temporal		-		1:1
inherited	end datetime	datetime at which the concept ended	end datetime	datetime the procedure ended	temporal		-		0:1
inherited	body site	anatomical site or structure associated to the concept	body site	anatomical site or structure visualised by the imaging procedure	Body Site				0:n
inherited	intent	intention for the concept	intent	intention for the imaging procedure	Intent				0:1

Concept cardinalities:

General concept name	cardinality for concept to Administrative Case	cardinality for concept to Data Provider	cardinality for concept to Subject Pseudo Identifier	cardinality for concept to Source System
Imaging Procedure	0:1	1:1	1:1	1:1

4 Impact on the SPHN Dataset

This concept could come to replace the currently used Diagnostic Radiologic Examination (release 2023.2), as it is a more general concept which includes all types of imaging procedure, as some techniques are for the moment excluded (ultrasound for example). It also allows for inclusion of non-diagnostic and non-radiological procedures.

The introduction of the concept 'Semantic Mapping' in release 2024.1 makes the composedOf 'coding datetime' obsolete. It has therefore been removed from Procedure and in consequence from inheriting concepts. The predecessor to the Imaging Procedure-concept (Diagnostic Radiologic Examination) still had the composedOf 'coding datetime'.

5 Discussion

A new concept is proposed as a change request would modify both the name and the definition of the concept. The intention to create a more general concept including all types of imaging procedures has already been discussed in the introduction. The intention for imaging procedures was also a reason, as they are not only for diagnostic purposes, but also for other reasons such as follow-up imaging for fractures or tumours, or for screening purposes.

The new concept will also probably need to be adapted slightly once the DICOM / Imaging Study concepts are finalised in order to include a link to those concepts. A Method attribute would also be added if not included in ImagingStudy. The intention of this concept is not to represent DICOM metadata as this will be addressed in future concepts. Therefore not all procedures present in DICOM format (e.g. ECG) are meant to be represented by this concept, only imaging procedures.

The time and effort necessary for maintaining a CHOP valueset is an argument for not using it as the standard. CHOP is also less complete and less hierarchically structured than SNOMED CT. Finally, as it is a national standard, it does not permit interoperability on an international level. A list of CHOP codes which represent imaging procedures will be kept as an aid to help hospitals locate the procedures for this concept, but will no longer be used as a standard for mapping.

Link to change request Diagnostic Radiologic Examination for justification behind deprecating it : https://docs.google.com/document/d/1WU89hv9rY92xC1dTDnCX2L4LziYNiG0GH1W5QFyhQLk/edit (excerpt below)

"Introduction
The Diagnostic Radiological Examination concept initially referred to the radiographic examinations used for a diagnostic purpose. To create a more general concept including all types of radiological procedures, such as MRI and ultrasound, and other types of imaging, it would be useful to update the concept name, definition, and valueset. To include all imaging procedures, it would be necessary to allow the use of SNOMED CT for a more complete coverage of imaging procedures, as CHOP is incomplete and poorly hierarchized.

Comparison to other standards/data models
An unrestrained valueset for CHOP codes would enable inclusion of missing codes for non-radiographic procedures such as ultrasounds and MRIs. However, this was rejected for reasons detailed in the discussion section.

Pros and cons

Advantages
[Imaging Procedure is a] More general concept including all types of imaging procedure, as some techniques are for the moment excluded (ultrasound for example). Also allows inclusion of non-diagnostic and non-radiological procedures.
[...]
Discussion
This change request will modify both the name and the definition of the concept. The reason behind the name and definition change from radiographic to imaging to create a more general concept including all types of imaging procedures has already been discussed in the introduction. However, the "Diagnostic" part of the concept name is also omitted from the new name and definition. This is justified by the fact that imaging procedures are not only done for diagnostic purposes, but also for other reasons such as follow-up imaging for fractures or tumours, or for screening purposes.

The new concept will also probably need to be adapted slightly once the DICOM / Imaging Study concepts are finalised in order to include a link to those concepts. A Method attribute would also be added if not included in ImagingStudy.

The time and effort necessary for maintaining a CHOP valueset is also an argument for changing the standard to SNOMED CT. CHOP is also less complete and less hierarchically structured than SNOMED CT. Finally, as it is a national standard, it does not permit interoperability on an international level. A list of CHOP codes which represent imaging procedures will be kept as an aid to help hospitals locate the procedures for this concept, but will no longer be used as a standard for mapping."

6 Example

Abdominal ultrasound - cannot be represented using concept Diagnostic Radiologic Examination (limited value set)

Imaging Procedure

code:
identifier: 45036003
name: Ultrasonography of abdomen (procedure)
coding system and version: SNOMED-CT-2023-07-31

start datetime: 2023-10-31T10:01:22+01:00

end datetime: 2023-10-31T10:18:42+01:00

body site:
code:
identifier: 27033000
name: Lower abdomen structure (body structure)
coding system and version: SNOMED-CT-2023-07-31
laterality: -

intent:
code:
identifier: 261004008
name: Diagnostic intent (qualifier value)
coding system and version: SNOMED-CT-2023-07-31