New concept proposal
Transplant, Transplant Presence

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1   Rationale

Organ transplantation can significantly impact an individual's health status, including their immune function and susceptibility to infection. Individuals who have received organ transplants often require long-term immunosuppressive therapy to prevent transplant rejection, which can increase their risk for various complications, including infections and certain types of cancer. Therefore, it is an important variable to consider in many health-related studies or medical histories. [ChatGPT4.0]

The name is based on the existing SPHN concept Access Device Presence. Like Access Device Presence, Transplant Presence does not represent the procedure of insertion but the presence of the transplant from insertion to potential removal.

A concept Transplant is introduced based on feedback from the Data Coordination Center to facilitate extension of the SPHN Dataset.

2   Comparison to other standards/data models

- **openEHR**: We couldn't find anything related to Transplant Presence.
- **FHIR** knows Resource BiologicallyDerivedProduct
  https://www.hl7.org/fhir/biologicallyderivedproduct.html
  This is a base resource that represents a material substance originating from a biological entity intended to be clinically applied (e.g., transplanted, infused, grafted) to another (possibly the same) biological entity.
- **SNOMED CT**: 737294004 |Transplant present (finding)| (Child of "Procedure related finding")
  https://browser.ihtsdotools.org/?perspective=full&conceptId1=737294004&edition=MAIN/2023-04-30&release=&languages=en
- **UMLS**:
  - Transplantation (Procedure): https://uts.nlm.nih.gov/uts/umls/concept/C0040732
  - Transplanted Tissue (Tissue) : https://uts.nlm.nih.gov/uts/umls/concept/C0332835

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3 Concept information

3.1. Transplant

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	**Transplant**	**transplanted organ or tissue from self or donor, including, e.g., kidney graft or bone marrow fluid**	**Transplant**	**transplanted organ or tissue from self or donor, including, e.g., kidney graft or bone marrow fluid**				SNOMED CT: 24486003 |Structure of transplant (body structure)|	
composedOf	code	coded information specifying the concept	code	coded information specifying the transplanted organ or tissue	Code	SNOMED CT	descendant of: 414265000 |Fluid containing hemopoietic stem cells (substance)|; descendant of: 260667007 |Graft (substance)|		1:1
composedOf	graft type code	coded information specifying the type of graft of the concept	graft type	coded information specifying the type of graft transplanted	Code	SNOMED CT	15879007 |Autograft (substance)|; 7970006 |Allograft (substance)|		0:1

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
Transplant				

3.2. Transplant Presence

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
Concept	**Transplant Presence**	**presence of a transplanted organ or tissue such as, e.g., a kidney graft**	**Transplant Presence**	**presence of a transplanted organ or tissue such as, e.g., a kidney graft**				SNOMED CT: 737294004 |Transplant present (finding)|	
composedOf	transplant	transplanted organ or tissue	transplant	transplanted organ or tissue	Transplant				1:1
composedOf	start datetime	datetime at which the concept started	transplant date time	date and time at which the organ or tissue was transplanted	temporal				0:1
composedOf	end datetime	datetime at which the concept ended	end date time	date and time at which the transplant was removed	temporal				0:1
composedOf	record datetime	datetime the concept was recorded	record date time	date and time at which the presence of the transplant was recorded	temporal				0:1
composedOf	body site	anatomical site or structure associated to the concept	body site	anatomical site or structure where the organ or tissue is transplanted to	Body Site				0:1

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
Transplant Presence	0:1	1:1	1:1	1:1

4   Impact on the SPHN Dataset

None.

5   Discussion

The SNOMED CT hierarchy Body Structure could be an alternative to Substance for the code for the transplanted organ. We use Substance here because it covers all organs and tissues needed by the IICU National Data Stream.

value set of composedOf 'code': In addition to the descendants of SNOMED CT "414265000 |Fluid containing hemopoietic stem cells (substance)" the value set of this composedOf also entails descendents of "260667007 |Graft (substance)|". The scope has been broadened from the initially intended "261571005 |Tissue graft - material (substance)|" to include for example vessel transplants like "303517000 |Arteriovenous graft material (substance)|".

'code' vs. 'graft type code': The distinction between 'code' and 'graft type code' is required as the type of graft cannot be represented by the code alone in all cases (lack of specific SNOMED CT codes). Naturally, values of 'code' and 'graft type code' must not contradict. It falls under the responsibility of the data provider to ensure data consistency.

Demarcation from concept 'Implant' and 'Implant Presence': The SNOMED CT codes allowed for the associated concepts 'Transplant' and 'Implant' offer distinct definitions for when to apply either of these two concepts.
Generally, "transplant" refers to a tissue or organ obtained from a donor, for example a kidney graft or bone marrow fluid. In contrast, "implant" denotes a medical device, for example a heart valve prosthesis or joint prosthesis. Implants are usually derived from non-organic tissue but may in principle also include structures of organic origin, for example, bioprosthetic valves (see Head *et al.*, 2017).

6   Example

Transplant Presence

> **transplant:**
> > code: SNOMED CT:286626001 |Live donor allograft kidney (substance)|
> > graft type code: SNOMED CT:7970006 |Allograft (substance)|
>
> start date time: 2015-12-03T00:00:00+01:00
> end date time: -
> record date time: 2023-06-07T12:55:00+01:00
> body site
> > code: SNOMED CT:181414000 |Entire kidney (body structure)|
> > laterality:
> > > code: SNOMED CT:7771000 |Left (qualifier value)|

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