

New concept proposal

Implant, Implant Presence

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Dataset release	2024.1	Consulted expert	Nora Toussaint

1 Rationale

The presence of an implant can significantly impact an individual's health and lifestyle, and may also increase their risk for certain complications, such as infections or device malfunctions. The body's reactions to these devices, such as immune responses or tissue integration, can also be important factors in health outcomes. Therefore, this variable is important to consider in many health-related studies and patient histories. [ChatGPT4.0]

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

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

2 Comparison to other standards/data models

- UMLS: Implant (<https://uts.nlm.nih.gov/uts/umls/concept/C0021102>)
 - A prosthesis placed permanently in tissue (NCI).
- openEHR (<https://ckm.openehr.org/ckm/>): We couldn't find anything related.
- FHIR knows Resource Profile: US Core Implantable Device Profile (<https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-implantable-device.html>) which does not fit our purposes
- SNOMED CT:
 - 40388003 |Implant, device (physical object)|
<https://browser.ihtsdotools.org/?perspective=full&conceptId1=40388003&edition=MAIN/2023-04-30&release=&languages=en>

Note that this SNOMED CT code does not cover cardiac pacemakers. For this reason, we do not introduce a meaning binding to it.

3 Concept information

3.1 Implant

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	Implant	implanted medical device, includes, e.g., heart valve prostheses or joint prostheses	Implant	implanted medical device, includes, e.g., heart valve prostheses or joint prostheses	Medical Device				
inherited	type code	coded information specifying the type of the concept	implant type code	coded information specifying the type of implant	Code	SNOMED CT; or other	for SNOMED CT: descendant of: 40388003 Implant, device (physical object) ; descendant of: 14106009 Cardiac pacemaker, device (physical object)		1:1
inherited	product code	coded information specifying the product of the concept	product code	coded information specifying the implanted product	Code				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
Implant				

3.2 Implant 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 for composedOf
Concept	Implant Presence	presence of an implanted medical device	Implant Presence	presence of an implanted medical device					
composedOf	implant	implanted medical device of this concept	implant	medical device implanted	Implant				1:1
composedOf	start datetime	datetime at which the concept started	implant start date time	date and time at which the implant was implanted	temporal				0:1
composedOf	end datetime	datetime at which the concept ended	implant end date time	date and time at which the implant was removed	temporal				0:1

composedOf	record datetime	datetime the concept was recorded	record date time	date and time when the presence of the implant was recorded	temporal				0:1
composedOf	body site	anatomical site or structure associated to the concept	body site	anatomical site or structure at which the implant is implanted	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
Implant Presence	0:1	1:1	1:1	1:1

4 Impact on the SPHN Dataset

None.

5 Discussion

The name Medical Device Presence has been initially discussed for this concept. However, the similarity to Access Device Presence could have resulted in confusions which concept to use for access devices. Therefore, Implant Presence was chosen to avoid confusions.

The value set the concept '[Access Device](#)' used by the existing SPHN concept '[Access Device Presence](#)' (release 2024.1) only allows SNOMED CT codes restricted to 105789008 |Cannula/tube/catheter, device (physical object)| and descendants thereof. This does not overlap with the new concept Implant Presence.

Meaning binding: The SNOMED CT code [373061006](#) (Device applied to patient (finding)) has initially been considered as meaning binding for 'Implant Presence'. However, in the current release (2023.2) this would result in a conflict with the meaning binding of the concept '[Access Device Presence](#)' (SNOMED CT: [397578001](#) |Device in situ (finding)|) which is a child of "Device applied to patient (finding)". Access Devices would therefore be subordinate to Implants. Apparently, SNOMED CT does not clearly distinguish access devices and implants in its finding hierarchy. Therefore no meaning binding is used for 'Implant Presence' and the meaning binding of '[Access Device Presence](#)' will be removed (release 2024.1).

Demarcation from concept '[Transplant](#)' and 'Transplant 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](#)).

Potential future standards for the product code of 'Implant' may use codes from EUDAMED (European Medical Device Database; UDI-DI from <https://ec.europa.eu/tools/eudamed/#/screen/search-device>) or GUDID (Global Unique Device identifier Database; Primary DI Number from <https://accessgudid.nlm.nih.gov/>).

6 Example

Implant Presence

implant:

type code: 705889006 |Implantable knee prosthesis (physical object)|

product code: -

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: 72696002 |Knee region structure (body structure|

laterality:

code: 7771000 |Left (qualifier value)|