

## Change request

# Systemic Arterial Blood Pressure

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<b>Dataset release</b>	2022.1	<b>Consulted expert</b>	-

## 1 Change request input/rationale

Currently, only *Systemic Arterial Blood Pressure* is defined in the SPHN Dataset without specifying the measurement method. This concept does not cover any invasive blood pressure measurements performed in an intensive care setting and the pulmonary arterial blood pressure for example, cannot be expressed with this rather narrow concept. Therefore, a general concept *Blood Pressure* should replace the existing concept Systemic Arterial Blood Pressure so that all blood pressure values can be represented by one single concept.

## 2 Comparison to other standards

### 2.1 SNOMED CT

In SNOMED CT, there is a concept for arterial blood pressure: 386534000 |Arterial blood pressure (observable entity)|, which is a child of a more general concept for blood pressure: 75367002 |Blood pressure (observable entity)|.

### 2.2 LOINC

In LOINC, there is a concept for a blood pressure panel with LOINC code 85354-9:

LOINC	Name	Example UCUM Units
<b>85354-9</b>	Blood pressure panel with all children optional	
<b>8480-6</b>	Systolic blood pressure	mm[Hg]
<b>8462-4</b>	Diastolic blood pressure	mm[Hg]
<b>8478-0</b>	Mean blood pressure	mm[Hg]
<b>8357-6</b>	Blood pressure method	
<b>41904-4</b>	Blood pressure measurement site	

8358-4	Blood pressure device Cuff size	cm
41901-0	Type of Blood pressure device	

## 2.3 HL7 FHIR

In HL7 FHIR, the blood pressure is considered as an observation in the vital sign category.

## 3 Change content

### 3.1 Currently released concept

SPHN Dataset version: 2021.1

Unique concept ID: 0000000294

Concept name	Description	Type	Value set	Meaning binding SNOMED CT	Meaning binding LOINC
<b>Systemic Arterial Blood Pressure</b>	arterial blood pressure in systemic circulation			386534000  Arterial blood pressure (observable entity)	85354-9 Blood pressure panel with all children optional
<b>systolic pressure</b>	measured systolic pressure	quantitative		271649006  Systolic blood pressure (observable entity)	8480-6 Systolic blood pressure
<b>diastolic pressure</b>	measured diastolic pressure	quantitative		271650006  Diastolic blood pressure (observable entity)	8462-4 Diastolic blood pressure
<b>mean pressure</b>	measured average pressure	quantitative		6797001  Mean blood pressure (observable entity)	
<b>datetime</b>	datetime of measurement	temporal			
<b>body site</b>	body site of measurement	Body Site			
<b>method</b>	method used to measure the blood pressure	Measurement Method			
<b>unit</b>	unit in which the blood pressure is expressed	Unit	mm[Hg]		

## 3.2 Proposed new concept

Contextualized concept name	Description	Type	Standard	Value set	Meaning binding SNOMED CT	Meaning binding LOINC
<b>Blood Pressure</b>	blood pressure measured either in the artery, in the vein, or in the pulmonary circulation				75367002  Blood pressure (observable entity)	
<b>systolic pressure</b>	measured systolic pressure	Quantity		Unit: mm[Hg]	271649006  Systolic blood pressure (observable entity)	8480-6 Systolic blood pressure
<b>diastolic pressure</b>	measured diastolic pressure	Quantity		Unit: mm[Hg]	271650006  Diastolic blood pressure (observable entity)	8462-4 Diastolic blood pressure
<b>mean pressure</b>	measured average pressure	Quantity		Unit: mm[Hg]	6797001  Mean blood pressure (observable entity)	8478-0 Mean blood pressure
<b>measurement datetime</b>	datetime of measurement	temporal				
<b>body site</b>	anatomical location where the blood pressure was measured, e.g. a blood vessel structure in case of invasive blood pressure measurements, or upper arm structure in case of a non-invasive measurement	Body Site	SNOMED CT 2021-07-31	child of: 113257007  Structure of cardiovascular system (body structure) ; 40983000  Structure of upper extremity between shoulder and elbow (body structure)  68367000  Thigh structure (body structure) ; 8205005  Wrist region structure (body structure) ; 7569003  Finger structure (body structure) ; 344001  Ankle region structure (body structure)		
<b>measurement method</b>	method used to measure the blood pressure	Measurement Method	SNOMED CT	child of: 716777001   Hemodynamic monitoring (regime/therapy)   or child of: 46973005  Blood pressure taking (procedure)		

## 4 Pros and cons

### 4.1 Advantages

- All blood pressure measurements no matter if invasive or non-invasive measurements can be covered with one single concept
- Avoids confusion which blood pressure concept to use (advantage over alternative to define a second broader blood pressure concept in addition to the existing ones)

### 4.2 Disadvantages of the change

- For non-invasive blood pressure measurements, a more complex concept has to be used

## 5 Impact and effort

### 5.1 Impact on SPHN Dataset

The existing concepts *Systemic Arterial Blood Pressure* and *Central Venous Pressure* are replaced with a more general concept *Blood Pressure*. As a basis for the new *Blood Pressure* concept the *Systemic Arterial Blood Pressure* concept is taken and the following is adapted:

- the SNOMED CT meaning binding changes from 386534000 |Arterial blood pressure (observable entity)| to 75367002 |Blood pressure (observable entity)|,
- an additional composedOf *method* is added to the concept which allows to specify the measurement method for invasive blood pressure measurement procedures,
- the value set for the composedOf *body site* has been specified in a way that invasive and non-invasive measurements are represented,

The *Measurement Method* concept has to be adapted due to changing the type for measurement method from Code to Measurement Method, which will then have an impact on the *Heart Rate* concept (value set for composedOf method needs to be adapted).

## 6 Discussion

Blood Pressure can be measured invasive and non-invasive but semantically it is the same concept of Blood Pressure. The pieces of information related to blood pressure measurements do not differ depending on whether the arterial pressure, the venous pressure or the pressure in the pulmonary circulation was measured. For all these blood pressure measurements there is a systolic, diastolic and mean pressures value. With the new composedOf *method*, it can be expressed whether it was an invasive or a non-invasive measurement and the information if it is a systemic arterial blood pressure can still be expressed by using the method 42826002 |Systemic arterial pressure monitoring (regime/therapy)| or 73002000 |Measurement of systemic arterial pressure (regime/therapy)|.