



# SALUS

“Scalable, Standard based Interoperability Framework for Sustainable Proactive Post Market Safety Studies”

## SPECIFIC TARGETED RESEARCH PROJECT

**PRIORITY Objective ICT-2011.5.3 b) Tools and environments enabling the re-use of electronic health records**

### SALUS D4.3.1 SALUS Harmonized Ontology for Post Market Safety Studies –R1

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## EXECUTIVE SUMMARY

This report describes the prototype of the semantic resource set developed to define the SALUS harmonized model to support the semantic interoperability between the clinical research and clinical care systems of the SALUS project for post market safety studies. The deliverable itself comprises of the SALUS Entity Models, the Source Content Entity Models, the Target Content Entity Models, and the set of ontologies and terminologies developed or collected to express them. For each of the semantic resources the functionality is described in this report.

During the beginning of the project we noticed that the term “Harmonized Ontology” caused confusion between the partners. Some interpret this term as mandating that all the concepts defined by the ontology are part of one single namespace, i.e. there’s a one to one relationship between an ontology and the namespace. Others have a more liberal interpretation, i.e. an ontology can define concepts from other ontology namespaces. In order to prevent misinterpretation we opted to use the term semantic resource set to describe the collection of common data elements, ontologies and terminologies systems needed to support the semantic mediation framework of task 4.4.

The current version of the semantic resource set contains the SALUS Entity Models, which together define the SALUS Harmonized Model. These entities were identified in D4.2.1 on the basis of the different source and target content standards. In order to express these SALUS Entity Models we make use of ontologies. The Entity Models are formal models to represent a subject and its relationships. The main ontology, the SALUS CIM ontology, to express these entity models is automatically generated from the XSD schema collecting all the SALUS Common Data Elements (from D4.2.1) using the Ontmalizer tool (from task 4.4 and described in deliverable D4.4.1). The content models of the two data sources, i.e. LISPA and UKD, are formalized into two Source Content Entity Models. Similarly the content model of a target system, i.e. OMOP CDM, is formalized into a corresponding Target Content Entity Model. Note that there was no need yet to formalize the second target content model ICH E2B(R2) into a Target Content Entity Model as the ICSR tool uses the native content model. These three types of entity models allow us to establish a hub and spoke mediation process transforming a Source Content Entity Model via the SALUS Entity Models to a Target Content Entity Model. Having a hub and spoke mediation process allows us to limit the amount of mappings needed in task 4.4. A set of terminologies, represented using SKOS, is collected to specify the coded values for each of the entity models. For the SALUS Entity Models we defined the hub terminologies to be: ICD-10, SNOMED-CT, ATC, and HL7 AdministrativeGender. The source terminologies used in LISPA are ICD-9-CM and ATC. The source terminologies used in UKD are ICD-10-GM and ATC. The target terminologies are MedDRA, SNOMED-CT, ATC and HL7 AdministrativeGender.

In the next version of the semantic resource set we will refine the entity models and try to replace the concepts from our proprietary SALUS CIM ontology with concepts from non-proprietary ontologies. Depending on the pilot scenarios additional Source and Target Content Entity Models and Terminologies will be added. We plan to perform consistency checking on the semantic resource set using existing tools to detect any knowledge formalization and reconciliation errors, and also to repair any of the detected inconsistencies.

The second version of this report is to be delivered at M24.

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# 1 INTRODUCTION

## 1.1 Purpose

This report describes the prototype of the semantic resource set developed to define the SALUS harmonized model to support the semantic interoperability between the clinical research and clinical care systems of the SALUS project for post market safety studies. The deliverable itself comprises of the SALUS Entity Models, the Source Content Entity Models, the Target Content Entity Models, and the set of ontologies and terminologies developed or collected to express them. For each of the semantic resources the functionality is described in this report.

Because of the nature of the work, tasks 4.3 (Building SALUS Harmonized ontology for Post Market Safety Studies) and 4.4 (Developing the Semantic Mediation Framework) have many dependencies and therefore both tasks were conducted in parallel with immediate feedback of the results of one task to the other.

The description of work for task 4.3 states: “In this task an ontology engineering effort will be carried out to create the SALUS harmonized ontology. The core of the ontology will be based on the formal representation of the common set of data elements identified in Task 4.2. In addition to this, supporting ontology fragments from domain specific ontologies (such as drug ontologies, adverse drug reaction ontologies like OntoMedDRA, specific disease ontology) will be added to this common ontology by providing the necessary semantic interlinkages between these ontology fragments to build SALUS harmonized ontology. The harmonized ontology will also cover the related fragments of the terminologies used in clinical care and research domain like MedDRA, LOINC, ATC, SNOMED, ICD10, WHODD. Finally, this harmonized ontology will evolve by adding the ontological models of the content models defined as archetypes, CDA templates or CDISC ODM models through aligning these ontologies with the SALUS core common data element sets, domain specific ontologies and terminologies. For this purpose, we will support enabling ontology lifting and alignment tools.”

During the beginning of the project we noticed that the term “Harmonized Ontology” caused confusion between the partners. Some interpret this term as mandating that all the concepts defined by the ontology are part of one single namespace, i.e. there’s a one to one relationship between an ontology and the namespace. Others have a more liberal interpretation, i.e. an ontology can define concepts from other ontology namespaces. In order to prevent misinterpretation we opted to use the term semantic resource set to describe the collection of common data elements, ontologies and terminologies systems needed to support the semantic mediation framework of task 4.4.

This document is structured as follows. Section 2 introduces the concept of entity models. Section 3 defines the SALUS entity models. Section 4 describes the used terminologies. Section 5 specifies the source content entity models. Section 6 specifies the target content entity models. Section 7 lists the content of semantic resource set. Section 8 states the conclusion and highlights the future work.

## 1.2 Scope

This document is a report on a prototype and thus the prototype itself is considered to be the main deliverable.

## 1.3 Reference documents

The following documents were used or referenced in the development of this document:

- SALUS Description of Work (SALUSPartB\_20110118.pdf)
- Deliverable 3.2.1 - Survey of the State of the Art

- Deliverable 4.1.1 - SALUS Content models for the Functional Interoperability Profiles for Post Market Safety Studies - R1
- Deliverable 4.2.1 - SALUS Common Set of Data Elements for Post Market Safety Studies - R1
- Deliverable 4.4.1 - SALUS Semantic Mediation Framework -R1

## 1.4 Definitions and Acronyms

### 1.4.1 Definitions

Term	DEFINITION
Entity	A subject in a certain domain with its relationships to other objects.
Entity Model	The formal model for representing an entity.

Table 1 List of Definitions

### 1.4.2 Abbreviations and Acronyms

Abbreviation/ Acronym	DEFINITION
ADE	Adverse Drug Event
ATC	Anatomical Therapeutic Chemical
CDA	Clinical Document Architecture
CDE	Common Data Element
CDM	Common Data Model
CDISC	Clinical Data Interchange Standards Consortium
CDISC ODM	CDISC Operational Data Model
CIM	Common Information Model
DoW	Description of Work
HL7	Health Level Seven
HL7 CCD	HL7 Continuity of Care Document
HL7 HQMF	HL7 Health Quality Measures Format
HLGT	High Level Group Terms
HLT	High Level Terms
ICD-9-CM	International Classification of Diseases, 9th Rev., Clinical Modification
ICD-10	International Statistical Classification of Diseases and Related Health Problems, 10th rev
ICH	International Conference on Harmonisation of technical requirements for registration of pharmaceuticals for human use
ICH E2B	ICH harmonised tripartite guideline. Maintenance of the ICH guideline on clinical safety data management: data elements for transmission of individual case safety reports E2B(R2) Current <i>Step 4</i> version
ICSR	Individual Case Safety Reports
IHE	Integrating the Healthcare Enterprise
IHE PCC	IHE Patient Care Coordination
ISO	International Organization for Standardization
ISO/CEN EN 13606	European norm from the European Committee for Standardization (CEN) : Health informatics - Electronic Health Record (EHR) Communication
LISPA	Lombardia Informatica
LLT	Low Level Terms
LOINC	Logical Observation Identifiers Names and Codes
MedDRA	Medical Dictionary for Regulatory Activities
N3	Notation 3
OMOP	Observational Medical Outcomes Partnership
OWL	Web Ontology Language
PT	Preferred Terms
RDF	Resource Description Framework



SKOS	Simple Knowledge Organization System
SNOMED CT	Systematized Nomenclature of Medicine Clinical Terms
SOC	System Organ Class
TUD	Technical University of Dresden
UKD	University Hospital of Dresden
XML	eXtensible Markup Language
XSD	XML Schema Definition
WHODD	World Health Organization (WHO) Drug Dictionary

Table 2 List of Abbreviations and Acronyms

## 2 ENTITY MODELS

### 2.1 Semantic Web Standards Used

We use Semantic Web<sup>1</sup> standards (recommendations) to create the semantic resource set. In particular we use RDF<sup>2</sup> and OWL<sup>3</sup> to create our models and to serialize the models we use Turtle<sup>4</sup> (a more human readable alternative to RDF/XML<sup>5</sup>). For rules we use Notation3<sup>6</sup> (N3), a super set of Turtle (and RDF) allowing for graph literals and variables, which are needed to express implications between graphs.

### 2.2 Entity Models

An XSD schema is intended to fix the structure of a corresponding XML document. For this purpose an XSD provides for example cardinality constructs, which allow the designer to state that a certain element has a specified minimum and maximum number of occurrences in the document. As a consequence an XML document not having the specified amount of that specific element is considered invalid. An ontology expressed using for instance OWL does however not describe a structure of a document but describes concepts and their potential relationships. Users of an ontology are always free to use a concept of an ontology or not and thus designers of an ontology can not force users of an ontology to use all of their declared concepts. For example even if the ontology mentions some minimal cardinality for a certain property it still allows a data producer not to state the property in the data. However it does allow a consumer to deduce that the relationship does exist (even if it's not stated explicitly). Thus an ontology in itself is not sufficient for a knowledge engineer to know what to minimally express in a certain domain.

To better guide the data producers on what to state and to help the ontologist on what needs to be expressed, we create entity models. An entity model is a formal model to represent an entity and its relationships. An entity is a subject in a certain domain. In order to state such an entity model we use concepts from ontologies and terminologies. The entity model states all the relationships that should be expressed about a subject. An entity model clearly indicates to a user how to represent a certain subject.

We defined three types of Entity Models:

- Source Content Entity Models: formal models from the source content systems, i.e. the data sources in the project.
- SALUS Entity Models: formal models of the SALUS harmonized model.
- Target Content Entity Models: formal models from the target content systems, i.e. the data targets in the project.

### 2.3 Hub and Spoke Semantic Mediation

To minimize the number of mappings needed in the Semantic Mediation Framework of task 4.4 we use a hub and spoke mediation process.

Figure 1 shows the intended mediation from the source models to the target models via the SALUS model. The referenced models are explained in the following sections. However for this version

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<sup>1</sup> <http://www.w3.org/standards/semanticweb/>

<sup>2</sup> <http://www.w3.org/TR/rdf-primer/>

<sup>3</sup> <http://www.w3.org/TR/owl2-primer/>

<sup>4</sup> <http://www.w3.org/TR/turtle/>

<sup>5</sup> <http://www.w3.org/TR/rdf-syntax-grammar/>

<sup>6</sup> <http://www.w3.org/TeamSubmission/n3/>

ISO/CEN EN 13606, ICH E2B XML and HL7 HQMF have not been formalized yet into content entity models.

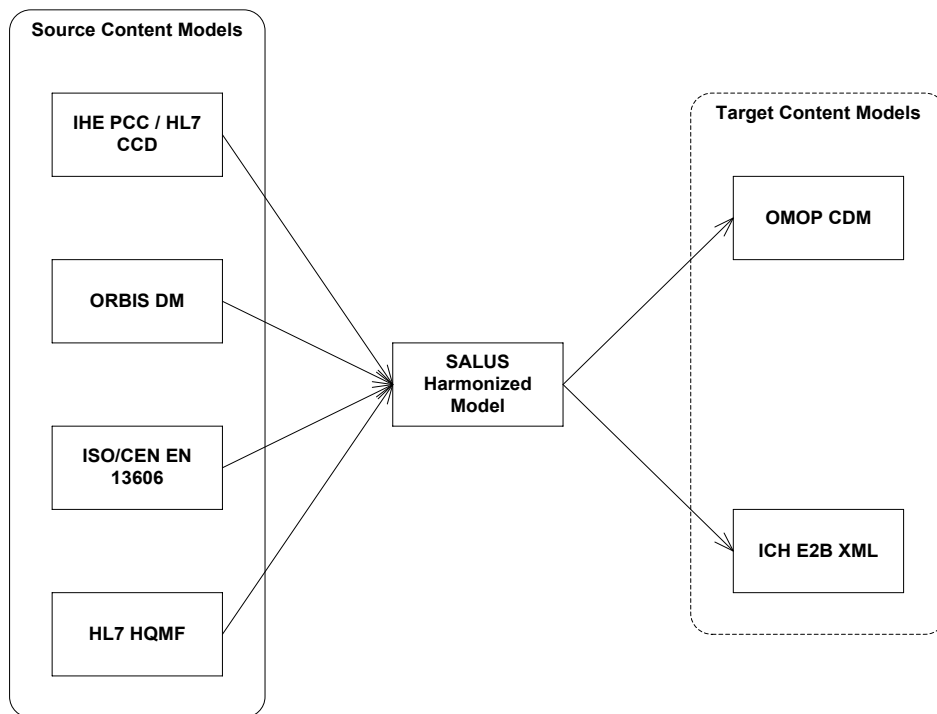


Figure 1 Hub and spoke model mediation

Figure 2 shows the mediation from the source terminologies to the target terminologies via the identified hub terminologies. Multiple hub terminologies are selected, each for a specific sub domain. The referenced terminologies are explained in the following sections.

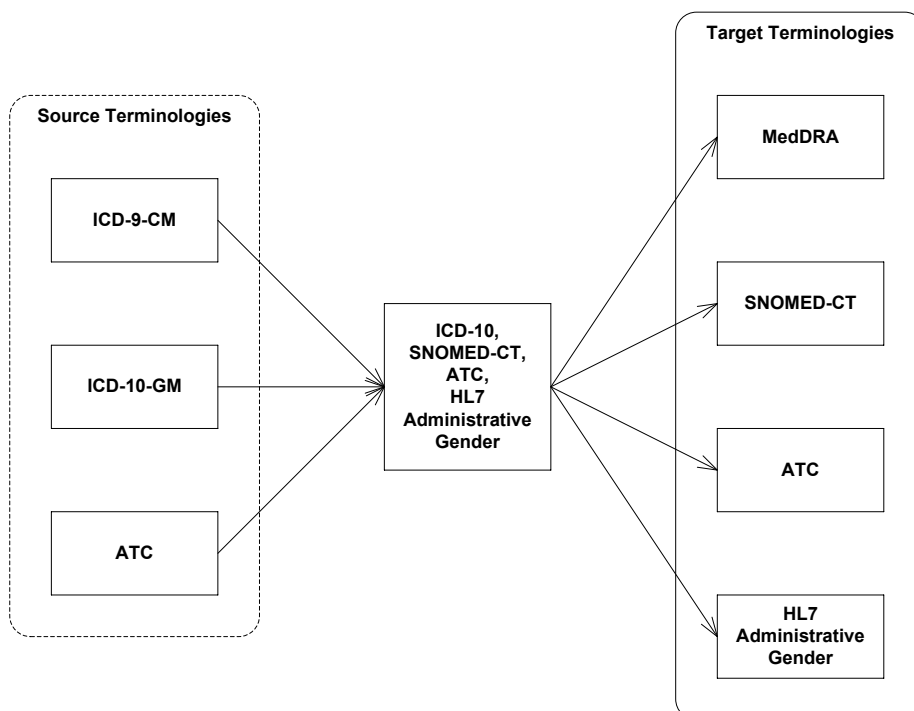


Figure 2 Hub and spoke terminology mediation

### 3 SALUS ENTITY MODELS

In D4.2.1 we identified the different entities and the information they should contain. The identified entities are: allergy, condition, encounter, familyhistory, immunization, medication, pregnancy, procedure, result, socialhistory, vitalsign and patient.

For each of these entities the relevant data elements were identified based on the different source and target content standards, in D4.1.1 and then D4.2.1. Further details about SALUS Common Data Elements (CDEs) are presented in D4.2.1. In task 4.3 an XSD schema containing all these elements was constructed. Using the Ontmalizer tool (from task 4.4 and described in deliverable D4.4.1) the XSD was transformed into the SALUS Common Information Model (CIM) ontology. As a result of this almost all the ontological concepts thus appear in our proprietary SALUS CIM namespace. The complete SALUS CIM Ontology represented in N3 syntax is available at <http://www.salusproject.eu/ontology/salus-cim-ontology.n3>.

During the remainder of the project we will try to replace these proprietary SALUS CIM namespace elements with elements from non-proprietary namespaces by re-using and referencing the existing ontologies.

#### 3.1 Namespaces

Following namespaces are used to express the entities mentioned next.

```
@prefix :           <http://www.srdc.com.tr/ontmalizer/instance#> .
@prefix foaf:       <http://xmlns.com/foaf/0.1/> .
@prefix owl:      <http://www.w3.org/2002/07/owl#> .
@prefix rdf:        <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix rdfs:       <http://www.w3.org/2000/01/rdf-schema#> .
@prefix salus:      <http://www.salusproject.eu/ontology/common-information-
model#> .
@prefix v3:         <urn:hl7-org:v3#> .
@prefix xsd:        <http://www.w3.org/2001/XMLSchema#> .
```

#### 3.2 SALUS Entity Models

The SALUS Entity Models defining the SALUS Harmonized Model are presented next.

##### 3.2.1 Allergy

This is the entity model to represent the allergy, intolerance or adverse event of the patient. It is composed of the following Common Data Elements:

- adverseEventType: Coded type of the allergy / intolerance / adverse event (e.g. drug allergy, food intolerance)
- adverseEventDate: Effective time interval of the allergy / intolerance / adverse event
- product: Product (i.e. substance) that causes the allergy / intolerance / adverse event (e.g. egg protein, dust, nifedipine)
- reaction: The condition which occurs as a reaction to the allergy / intolerance / adverse event; can be any condition
- status: Coded status of the allergy / intolerance / adverse event (e.g. active, inactive, resolved)
- severity: Coded severity of the allergy / intolerance / adverse event (e.g. low, moderate, high)
- comment: Further free text comments / information about the allergy / intolerance / adverse event

An example salus:Allergy instance is provided below.

```

[ rdf:type salus:Allergy ;
  salus:adverseEventDate
    [ rdf:type salus:ivlTs ;
      salus:low "2008-06-24T00:00:00"^^xsd:dateTime
    ] ;
  salus:adverseEventType
    [ rdf:type salus:cd ;
      salus:code "419199007" ;
      salus:codeSystem "2.16.840.1.113883.6.96" ;
      salus:codeSystemName "SNOMED CT" ;
      salus:displayName "Allergy to substance"
    ] ;
  salus:product
    [ rdf:type salus:cd ;
      salus:code "J01CA" ;
      salus:codeSystem "2.16.840.1.113883.6.73" ;
      salus:codeSystemName "ATC" ;
      salus:displayName "Penicillins with extended spectrum"
    ] ;
  salus:reaction
    [ rdf:type salus:Condition ;
      salus:problemCode
        [ rdf:type salus:cd ;
          salus:code "4386001" ;
          salus:codeSystem "2.16.840.1.113883.6.96" ;
          salus:codeSystemName "SNOMED CT" ;
          salus:displayName "Bronchospasm"
        ] ;
      salus:problemType
        [ rdf:type salus:cd ;
          salus:code "55607006" ;
          salus:codeSystem "2.16.840.1.113883.6.96" ;
          salus:codeSystemName "SNOMED CT" ;
          salus:displayName "Problem"
        ]
    ] ;
  salus:severity
    [ rdf:type salus:cd ;
      salus:code "H" ;
      salus:codeSystem "2.16.840.1.113883.5.1063" ;
      salus:codeSystemName "ObservationValue" ;
      salus:displayName "High"
    ] ;
  salus:status
    [ rdf:type salus:cd ;
      salus:code "55561003" ;
      salus:codeSystem "2.16.840.1.113883.6.96" ;
      salus:codeSystemName "SNOMED CT" ;
      salus:displayName "Active"
    ]
] .

```

### 3.2.2 Condition

This is the entity model to represent the condition (i.e. problem, diagnosis, finding, symptom) of the patient. It is composed of the following Common Data Elements:

- **problemDate:** Effective time interval of the condition
- **problemType:** Coded type of the condition (e.g. problem, diagnosis, finding, symptom)
- **problemName:** Free text name of the condition

- **problemCode:** Coded name of the condition. In case the Time of Death is provided, this is the coded cause of death.
- **problemStatus:** Coded status of the condition (e.g. active, inactive, resolved)
- **problemSeverity:** Coded severity of the condition (e.g. low, moderate, high)
- **timeOfDeath:** Time when the patient died
- **treatingProvider:** Healthcare provider involved in the diagnosis / treatment of the condition
- **comment:** Further free text comments / information about the condition

An example `salus:Condition` instance is provided below.

```
[ rdf:type salus:Condition ;
  salus:problemCode
    [ rdf:type salus:cd ;
      salus:code "493" ;
      salus:codeSystem "2.16.840.1.113883.6.2" ;
      salus:codeSystemName "ICD-9-CM" ;
      salus:displayName "Asthma"
    ] ;
  salus:problemDate
    [ rdf:type salus:ivlTs ;
      salus:low "2003-08-01T00:00:00"^^xsd:dateTime
    ] ;
  salus:problemName "Asthma" ;
  salus:problemSeverity
    [ rdf:type salus:cd ;
      salus:code "H" ;
      salus:codeSystem "2.16.840.1.113883.5.1063" ;
      salus:codeSystemName "ObservationValue" ;
      salus:displayName "High"
    ] ;
  salus:problemStatus
    [ rdf:type salus:cd ;
      salus:code "55561003" ;
      salus:codeSystem "2.16.840.1.113883.6.96" ;
      salus:codeSystemName "SNOMED CT" ;
      salus:displayName "Active"
    ] ;
  salus:problemType
    [ rdf:type salus:cd ;
      salus:code "55607006" ;
      salus:codeSystem "2.16.840.1.113883.6.96" ;
      salus:codeSystemName "SNOMED CT" ;
      salus:displayName "Problem"
    ] ;
  salus:timeOfDeath "2012-05-10T00:00:00"^^xsd:dateTime ;
  salus:treatingProvider
    [ rdf:type salus:HealthcareProvider ;
      salus:providerAddress
        [ rdf:type salus:addr ;
          salus:city "Milan" ;
          salus:country "Italy" ;
          salus:postalCode "20158" ;
          salus:state "MI" ;
          salus:streetAddressLine "Via Don Giovanni Minzoni, No 24"
        ] ;
      salus:providerID
        [ rdf:type salus:ii ;
          salus:extension "54321678906" ;
          salus:root "2.16.840.1.113883.2.9.4.3.2"
        ] ;
    ] ;
```

```

    salus:providerOrganization
      [ rdf:type salus:OrganizationInformation ;
        salus:organizationID
          [ rdf:type salus:ii ;
            salus:extension "65432178902" ;
            salus:root "2.16.840.1.113883.2.9.4.3.2.4"
          ] ;
        salus:organizationName "Wellness Care Clinic"
      ] ;
    salus:providerRole
      [ rdf:type salus:cd ;
        salus:code "309345004" ;
        salus:codeSystem "2.16.840.1.113883.6.96" ;
        salus:codeSystemName "SNOMED CT" ;
        salus:displayName "Chest Physicians"
      ] ;
    salus:providerTelecom
      [ rdf:type salus:tele ;
        salus:use "WP" ;
        salus:value "tel:+390239445566"
      ] ;
    foaf:familyName "Passerini" ;
    foaf:givenName "Fabiola" ;
    foaf:title "Dr."
  ]
].

```

### 3.2.3 Encounter

This is the entity model to represent the encounter of the patient. It is composed of the following Common Data Elements:

- encounterID: Identifier of the encounter
- encounterType: Coded type of the encounter (e.g. ambulatory, inpatient, surgical)
- encounterDateTime: Effective time interval of the encounter
- encounterProvider: Healthcare provider involved in the encounter
- encounterOrganization: Healthcare provider organization where the encounter takes place
- reasonForVisit: Condition of the patient that causes the encounter

An example salus:Encounter instance is provided below.

```

[ rdf:type salus:Encounter ;
  salus:encounterDateTime
    [ rdf:type salus:ivlTs ;
      salus:high "2009-03-31T00:00:00"^^xsd:date ;
      salus:low "2009-03-31T00:00:00"^^xsd:date
    ] ;
  salus:encounterID
    [ rdf:type salus:ii ;
      salus:root "2a620155-9d11-439e-92b3-5d9815ff4de8"
    ] ;
  salus:encounterOrganization
    [ rdf:type salus:OrganizationInformation ;
      salus:organizationAddress
        [ rdf:type salus:addr ;
          salus:city "Milan" ;
          salus:country "Italy" ;
          salus:postalCode "20158" ;
          salus:state "MI" ;
          salus:streetAddressLine "Via Don Giovanni Minzoni, No 24"
        ]
      ]
    ]
].

```

```

    ] ;
    salus:organizationID
    [ rdf:type salus:ii ;
      salus:extension "65432178902" ;
      salus:root "2.16.840.1.113883.2.9.4.3.2.4"
    ] ;
    salus:organizationName "Wellness Care Clinic"
  ] ;
  salus:encounterProvider
  [ rdf:type salus:HealthcareProvider ;
    salus:providerAddress
    [ rdf:type salus:addr ;
      salus:city "Milan" ;
      salus:country "Italy" ;
      salus:postalCode "20158" ;
      salus:state "MI" ;
      salus:streetAddressLine "Via Don Giovanni Minzoni, No 24"
    ] ;
    salus:providerID
    [ rdf:type salus:ii ;
      salus:extension "54321678906" ;
      salus:root "2.16.840.1.113883.2.9.4.3.2"
    ] ;
    salus:providerOrganization
    [ rdf:type salus:OrganizationInformation ;
      salus:organizationID
      [ rdf:type salus:ii ;
        salus:extension "65432178902" ;
        salus:root "2.16.840.1.113883.2.9.4.3.2.4"
      ] ;
      salus:organizationName "Wellness Care Clinic"
    ] ;
    salus:providerRole
    [ rdf:type salus:cd ;
      salus:code "309345004" ;
      salus:codeSystem "2.16.840.1.113883.6.96" ;
      salus:codeSystemName "SNOMED CT" ;
      salus:displayName "Chest Physicians"
    ] ;
    salus:providerTelecom
    [ rdf:type salus:tele ;
      salus:use "WP" ;
      salus:value "tel:+390239445566"
    ] ;
    foaf:familyName "Passerini" ;
    foaf:givenName "Fabiola" ;
    foaf:title "Dr."
  ] ;
  salus:encounterType
  [ rdf:type salus:cd ;
    salus:code "GENRL" ;
    salus:codeSystem "2.16.840.1.113883.5.4" ;
    salus:codeSystemName "ActEncounterCode" ;
    salus:displayName "General"
  ] ;
  salus:reasonForVisit
  [ rdf:type salus:Condition ;
    salus:problemCode
    [ rdf:type salus:cd ;
      salus:code "578.9" ;
      salus:codeSystem "2.16.840.1.113883.6.2" ;

```



```

        salus:codeSystemName "ICD-9-CM" ;
        salus:displayName    "Hemorrhage of gastrointestinal tract,
unspecified"
    ] ;
    salus:problemDate
    [ rdf:type salus:ivlTs ;
      salus:low "2009-03-31T00:00:00"^^xsd:dateTime
    ] ;
    salus:problemType
    [ rdf:type salus:cd ;
      salus:code "282291009" ;
      salus:codeSystem "2.16.840.1.113883.6.96" ;
      salus:codeSystemName "SNOMED CT" ;
      salus:displayName "Diagnosis"
    ]
  ]
].

```

### 3.2.4 FamilyHistory

This is the entity model to represent the family history of the patient. It is composed of the following Common Data Elements:

- familyHistoryObservationDate: Time of entry of the family history
- kinshipType: Coded type of kinship with the patient
- familyHistoryObservationCode: Coded name of the family history observation
- ageAtOnset: Age of the kin when the family history observation became effective
- comment: Further free text comments / information about the family history

An example salus:FamilyHistory instance is provided below.

```

[ rdf:type salus:FamilyHistory ;
  salus:ageAtOnset 58 ;
  salus:familyHistoryObservationCode
  [ rdf:type salus:cd ;
    salus:code "401.9" ;
    salus:codeSystem "2.16.840.1.113883.6.2" ;
    salus:codeSystemName "ICD-9-CM" ;
    salus:displayName "Unspecified essential hypertension"
  ] ;
  salus:familyHistoryObservationDate "1988-01-01T00:00:00"^^xsd:dateTime ;
  salus:kinshipType
  [ rdf:type salus:cd ;
    salus:code "FTH" ;
    salus:codeSystem "2.16.840.1.113883.5.111" ;
    salus:codeSystemName "FamilyMember" ;
    salus:displayName "Father"
  ]
].

```

### 3.2.5 Immunization

This is the entity model to represent the immunization of the patient. It is composed of the following Common Data Elements:

- administeredDate: Time when the immunization is applied to the patient
- medicationSeriesNumber: Medication series number of the immunization
- route: Coded route of the immunization (e.g. intravenous)
- dose: Dose of the immunization
- site: Coded approach site of the immunization (e.g. upper arm structure)

- reaction: Coded reaction that the patient has to the immunization
- performer: Healthcare provider that applies the immunization to the patient
- medicationInformation: Details (e.g. coded product name, coded active ingredient, free text brand name) of the immunization
- comment: Further free text comments / information about the immunization

An example salus:Immunization instance is provided below.

```
[ rdf:type salus:Immunization ;
  salus:administeredDate "2001-03-03T00:00:00"^^xsd:dateTime ;
  salus:dose
    [ rdf:type salus:pq ;
      salus:unit "1" ;
      salus:value "1"
    ] ;
  salus:medicationInformation
    [ rdf:type salus:MedicationInformation ;
      salus:codedActiveIngredient
        [ rdf:type salus:cd ;
          salus:code "J06BB04" ;
          salus:codeSystem "2.16.840.1.113883.6.73" ;
          salus:codeSystemName "ATC" ;
          salus:displayName "hepatitis B immunoglobulin"
        ] ;
      salus:codedProductName
        [ rdf:type salus:cd ;
          salus:code "34689006" ;
          salus:codeSystem "2.16.840.1.113883.6.96" ;
          salus:codeSystemName "SNOMED CT" ;
          salus:displayName "Hepatitis B virus vaccine"
        ] ;
      salus:freeTextProductName "Hepatitis B virus vaccine"
    ] ;
  salus:medicationSeriesNumber 1 ;
  salus:performer
    [ rdf:type salus:HealthcareProvider ;
      salus:providerAddress
        [ rdf:type salus:addr ;
          salus:city "Milan" ;
          salus:country "Italy" ;
          salus:postalCode "20091" ;
          salus:state "MI" ;
          salus:streetAddressLine "Via Pietro Panzeri, No 12/7"
        ] ;
      salus:providerID
        [ rdf:type salus:ii ;
          salus:extension "54321678909" ;
          salus:root "2.16.840.1.113883.2.9.4.3.2"
        ] ;
      salus:providerOrganization
        [ rdf:type salus:OrganizationInformation ;
          salus:organizationID
            [ rdf:type salus:ii ;
              salus:extension "65432178902" ;
              salus:root "2.16.840.1.113883.2.9.4.3.2.4"
            ] ;
          salus:organizationName "Wellness Care Clinic"
        ] ;
      salus:providerRole
        [ rdf:type salus:cd ;
```

```

        salus:code "309343006" ;
        salus:codeSystem "2.16.840.1.113883.6.96" ;
        salus:codeSystemName "SNOMED CT" ;
        salus:displayName "Physician"
    ] ;
    salus:providerTelecom
    [ rdf:type salus:tele ;
      salus:use "WP" ;
      salus:value "tel:+390239003366"
    ] ;
    foaf:familyName "Sebastino" ;
    foaf:givenName "Tullia" ;
    foaf:title "Dr." .
] ;
salus:reaction
[ rdf:type salus:cd ;
  salus:code "247472004" ;
  salus:codeSystem "2.16.840.1.113883.6.96" ;
  salus:codeSystemName "SNOMED CT" ;
  salus:displayName "Weal"
] ;
salus:route
[ rdf:type salus:cd ;
  salus:code "IVINJ" ;
  salus:codeSystem "2.16.840.1.113883.5.112" ;
  salus:codeSystemName "RouteOfAdministration" ;
  salus:displayName "Injection, intravenous"
] ;
salus:site
[ rdf:type salus:cd ;
  salus:code "40983000" ;
  salus:codeSystem "2.16.840.1.113883.6.96" ;
  salus:codeSystemName "SNOMED CT" ;
  salus:displayName "Upper arm structure"
]
].

```

### 3.2.6 Medication

This is the entity model to represent the medication of the patient. It is composed of the following Common Data Elements:

- indicateMedicationStartStop: Effective time interval when the medication is used
- administrationTiming: Specific description of use time of the medication
- route: Coded route of the medication (e.g. oral inhalation)
- dose: Dose of the medication
- site: Coded approach site of the medication (e.g. nose)
- doseRestriction: Minimum and maximum doses that the medication can be taken
- productForm: Coded product form of the medication (e.g. tablet)
- deliveryMethod: Coded description of how the medication is administered
- medicationInformation: Details (e.g. coded product name, coded active ingredient, free text brand name) of the medication
- indication: Condition of the patient that causes the medication administration
- patientInstructions: Free text instructions to the patient (e.g. "keep in the refrigerator")
- reaction: Coded reaction that the patient has to the medication
- orderInformation: Details of the order (i.e. prescription)
- fulfillmentInstructions: Free text instructions to the dispensing pharmacist or nurse (e.g. "instruct patient on the use of occlusive dressing")

- fulfillmentHistory: Details of the fulfillment (i.e. dispensation)
- comment: Further free text comments / information about the medication

An example salus:Medication instance is provided below.

```
[ rdf:type salus:Medication ;
  salus:administrationTiming
    [ rdf:type salus:pivlTs ;
      salus:operator "A" ;
      salus:period
        [ rdf:type salus:pq ;
          salus:unit "h" ;
          salus:value "12"
        ]
      ]
    ] ;
  salus:dose
    [ rdf:type salus:pq ;
      salus:unit "mL" ;
      salus:value "5"
    ] ;
  salus:doseRestriction
    [ rdf:type salus:ivlPq ;
      salus:high
        [ rdf:type salus:pq ;
          salus:unit "mL" ;
          salus:value "10"
        ] ;
      salus:low
        [ rdf:type salus:pq ;
          salus:unit "mL" ;
          salus:value "5"
        ]
      ]
    ] ;
  salus:fulfillmentHistory
    [ rdf:type salus:FulfillmentHistory ;
      salus:dispenseDate "2008-02-01T00:00:00"^^xsd:dateTime ;
      salus:dispensingProvider
        [ rdf:type salus:HealthcareProvider ;
          salus:providerID
            [ rdf:type salus:ii ;
              salus:extension "54321678908" ;
              salus:root "2.16.840.1.113883.2.9.4.3.2"
            ] ;
          salus:providerOrganization
            [ rdf:type salus:OrganizationInformation ;
              salus:organizationID
                [ rdf:type salus:ii ;
                  salus:extension "65432178903" ;
                  salus:root "2.16.840.1.113883.2.9.4.3.2.4"
                ] ;
              salus:organizationName "Good Health Pharmacy"
            ] ;
          foaf:familyName "Salucci" ;
          foaf:givenName "Ottone" ;
          foaf:title "Dr."
        ] ;
      salus:fillNumber 1 ;
      salus:fillStatus
        [ rdf:type salus:cd ;
          salus:code "completed"
        ]
    ] ;
```

```

    ] ;
    salus:prescriptionNumber
    [ rdf:type salus:ii ;
      salus:extension "87654321901" ;
      salus:root "2.16.840.1.113883.2.9.4.3.2.6"
    ] ;
    salus:quantityDispensed
    [ rdf:type salus:pq ;
      salus:value "1"
    ]
  ] ;
  salus:fulfillmentInstructions "Fulfillment instruction explanation" ;
  salus:indicateMedicationStartStop
  [ rdf:type salus:ivlTs ;
    salus:high "2008-02-10T00:00:00"^^xsd:dateTime ;
    salus:low "2008-02-01T00:00:00"^^xsd:dateTime
  ] ;
  salus:indication
  [ rdf:type salus:Condition ;
    salus:problemCode
    [ rdf:type salus:cd ;
      salus:code "493" ;
      salus:codeSystem "2.16.840.1.113883.6.2" ;
      salus:codeSystemName "ICD-9-CM" ;
      salus:displayName "Asthma"
    ] ;
    salus:problemDate
    [ rdf:type salus:ivlTs ;
      salus:low "2008-02-01T00:00:00"^^xsd:dateTime
    ] ;
    salus:problemType
    [ rdf:type salus:cd ;
      salus:code "55607006" ;
      salus:codeSystem "2.16.840.1.113883.6.96" ;
      salus:codeSystemName "SNOMED CT" ;
      salus:displayName "Problem"
    ]
  ]
] ;
salus:medicationInformation
[ rdf:type salus:MedicationInformation ;
  salus:codedActiveIngredient
  [ rdf:type salus:cd ;
    salus:code "R03AC02" ;
    salus:codeSystem "2.16.840.1.113883.6.73" ;
    salus:codeSystemName "ATC" ;
    salus:displayName "Salbutamol"
  ] ;
  salus:codedBrandName
  [ rdf:type salus:cd ;
    salus:code "795354" ;
    salus:codeSystem "2.16.840.1.113883.6.88" ;
    salus:codeSystemName "RxNorm" ;
    salus:displayName "Albuterol 1 MG/ML Inhalant Solution
[Ventolin]"
  ] ;
  salus:codedProductName
  [ rdf:type salus:cd ;
    salus:code "245314" ;
    salus:codeSystem "2.16.840.1.113883.6.88" ;
    salus:codeSystemName "RxNorm" ;
    salus:displayName "Albuterol 1 MG/ML Inhalant Solution"
  ]
] ;

```

```

    ] ;
    salus:freeTextBrandName "Albuterol 1 MG/ML Inhalant Solution
[Ventolin]" ;
    salus:freeTextProductName "Albuterol 1 MG/ML Inhalant Solution"
] ;
salus:orderInformation
[ rdf:type salus:OrderInformation ;
  salus:fills 2 ;
  salus:orderDateTime "2008-02-01T00:00:00"^^xsd:dateTime ;
  salus:orderNumber
  [ rdf:type salus:ii ;
    salus:extension "87654321901" ;
    salus:root "2.16.840.1.113883.2.9.4.3.2.6"
  ] ;
  salus:orderingProvider
  [ rdf:type salus:HealthcareProvider ;
    salus:providerID
    [ rdf:type salus:ii ;
      salus:extension "54321678905" ;
      salus:root "2.16.840.1.113883.2.9.4.3.2"
    ] ;
    salus:providerOrganization
    [ rdf:type salus:OrganizationInformation ;
      salus:organizationID
      [ rdf:type salus:ii ;
        salus:extension "65432178901" ;
        salus:root "2.16.840.1.113883.2.9.4.3.2.4"
      ] ;
      salus:organizationName "Good Health Clinic"
    ] ;
    foaf:familyName "Palladino" ;
    foaf:givenName "Ersilia" ;
    foaf:title "Dr."
  ] ;
  salus:quantityOrdered
  [ rdf:type salus:pq ;
    salus:value "1"
  ]
] ;
salus:patientInstructions "Patient instruction explanation" ;
salus:productForm
[ rdf:type salus:cd ;
  salus:code "415215001" ;
  salus:codeSystem "2.16.840.1.113883.6.96" ;
  salus:codeSystemName "SNOMED CT" ;
  salus:displayName "Puff"
] ;
salus:reaction
[ rdf:type salus:cd ;
  salus:code "56018004" ;
  salus:codeSystem "2.16.840.1.113883.6.96" ;
  salus:codeSystemName "SNOMED CT" ;
  salus:displayName "Wheezing"
] ;
salus:route
[ rdf:type salus:cd ;
  salus:code "IPINHL" ;
  salus:codeSystem "2.16.840.1.113883.5.112" ;
  salus:codeSystemName "RouteOfAdministration" ;
  salus:displayName "Inhalation, oral"
] ;

```

```

salus:site
  [ rdf:type salus:cd ;
    salus:code "181195007" ;
    salus:codeSystem "2.16.840.1.113883.6.96" ;
    salus:codeSystemName "SNOMED CT" ;
    salus:displayName "Entire nose"
  ]
].

```

### 3.2.7 Pregnancy

This is the entity model to represent the pregnancy history of the patient. It is composed of the following Common Data Elements:

- pregnancyObservationDate: Time of entry of the pregnancy history
- pregnancyStatus: Coded status of the pregnancy
- lastMenstrualPeriodDate: Time of last menstrual period of the patient
- deliveryDate: Time of delivery of the patient
- comment: Further free text comments / information about the pregnancy history

An example salus:Pregnancy instance is provided below.

```

[ rdf:type salus:Pregnancy ;
  salus:pregnancyObservationDate "1987-02-05T00:00:00"^^xsd:dateTime ;
  salus:pregnancyStatus
    [ rdf:type salus:cd ;
      salus:code "47200007" ;
      salus:codeSystem "2.16.840.1.113883.6.96" ;
      salus:codeSystemName "SNOMED CT" ;
      salus:displayName "High risk pregnancy"
    ]
  salus:deliveryDate "1987-02-05T00:00:00"^^xsd:dateTime ;
  salus:lastMenstrualPeriodDate "1986-04-26T00:00:00"^^xsd:dateTime
].

```

### 3.2.8 Procedure

This is the entity model to represent the procedure of the patient. It is composed of the following Common Data Elements:

- procedureID: Identifier of the procedure
- procedureDateTime: Time when the procedure is performed
- procedureType: Coded name of the procedure
- procedureFreeTextType: Free text name of the procedure
- procedureStatus: Coded status of the procedure (e.g. completed, active, aborted, cancelled)
- bodySite: Coded target site of the procedure (e.g. hip joint)
- procedureProvider: Healthcare provider that performs the procedure
- indication: Condition of the patient that causes the procedure
- relatedEncounter: Associated encounter in which the procedure is performed
- comment: Further free text comments / information about the procedure

An example salus:Procedure instance is provided below.

```

[ rdf:type salus:Procedure ;
  salus:bodySite
    [ rdf:type salus:cd ;
      salus:code "182201002" ;
      salus:codeSystem "2.16.840.1.113883.6.96" ;
      salus:codeSystemName "SNOMED CT" ;
    ]
].

```

```

    salus:displayName "Entire hip joint"
  ] ;
salus:indication
  [ rdf:type salus:Condition ;
    salus:problemCode
      [ rdf:type salus:cd ;
        salus:code "391093004" ;
        salus:codeSystem "2.16.840.1.113883.6.96" ;
        salus:codeSystemName "SNOMED CT" ;
        salus:displayName "Hip Fracture"
      ] ;
    salus:problemDate
      [ rdf:type salus:ivlTs ;
        salus:low "2008-06-26T00:00:00"^^xsd:date
      ] ;
    salus:problemType
      [ rdf:type salus:cd ;
        salus:code "55607006" ;
        salus:codeSystem "2.16.840.1.113883.6.96" ;
        salus:codeSystemName "SNOMED CT" ;
        salus:displayName "Problem"
      ]
    ] ;
salus:procedureDateTime
  [ rdf:type salus:ivlTs ;
    salus:low "2008-07-01T00:00:00"^^xsd:date
  ] ;
salus:procedureFreeTextType "Total replacement of hip" ;
salus:procedureID
  [ rdf:type salus:ii ;
    salus:root "c1469c71-f76e-43d1-9003-4d2b0052b658"
  ] ;
salus:procedureProvider
  [ rdf:type salus:HealthcareProvider ;
    salus:providerAddress
      [ rdf:type salus:addr ;
        salus:city "Milan" ;
        salus:country "Italy" ;
        salus:postalCode "20139" ;
        salus:state "MI" ;
        salus:streetAddressLine "Via Giacinto Mompiani, No 8"
      ] ;
    salus:providerID
      [ rdf:type salus:ii ;
        salus:extension "54321678907" ;
        salus:root "2.16.840.1.113883.2.9.4.3.2"
      ] ;
    salus:providerOrganization
      [ rdf:type salus:OrganizationInformation ;
        salus:organizationID
          [ rdf:type salus:ii ;
            salus:extension "65432178902" ;
            salus:root "2.16.840.1.113883.2.9.4.3.2.4"
          ] ;
        salus:organizationName "Wellness Care Clinic"
      ] ;
    salus:providerRole
      [ rdf:type salus:cd ;
        salus:code "78703002" ;
        salus:codeSystem "2.16.840.1.113883.6.96" ;
        salus:codeSystemName "SNOMED CT" ;

```



```

        salus:displayName "General surgeon"
    ] ;
    salus:providerTelecom
    [ rdf:type salus:tele ;
      salus:use "WP" ;
      salus:value "tel:+390239778899"
    ] ;
    foaf:familyName "Neroni" ;
    foaf:givenName "Fabio" ;
    foaf:title "Dr."
  ] ;
  salus:procedureStatus
  [ rdf:type salus:cd ;
    salus:code "completed"
  ] ;
  salus:procedureType
  [ rdf:type salus:cd ;
    salus:code "52734007" ;
    salus:codeSystem "2.16.840.1.113883.6.96" ;
    salus:codeSystemName "SNOMED CT" ;
    salus:displayName "Total replacement of hip"
  ] ;
  salus:relatedEncounter
  [ rdf:type salus:Encounter ;
    salus:encounterDateTime
    [ rdf:type salus:ivlTs ;
      salus:high "2008-07-03T00:00:00"^^xsd:date ;
      salus:low "2008-06-31T00:00:00"^^xsd:date
    ] ;
    salus:encounterID
    [ rdf:type salus:ii ;
      salus:root "b15b0bba-51ab-4e63-8189-cff782591349"
    ] ;
    salus:encounterType
    [ rdf:type salus:cd ;
      salus:code "SURG" ;
      salus:codeSystem "2.16.840.1.113883.5.4" ;
      salus:codeSystemName "ActEncounterCode" ;
      salus:displayName "Surgical"
    ]
  ]
] .

```

### 3.2.9 Result

This is the entity model to represent the lab result of the patient. It is composed of the following Common Data Elements:

- resultID: Identifier of the lab result / vital sign
- resultDateTime: Effective time interval of the lab result / vital sign
- resultType: Coded name of the lab result / vital sign
- resultValue: Coded value / Physical quantity value (i.e. value with unit) / string value of the lab result / vital sign
- resultInterpretation: Coded interpretation of the lab result / vital sign (e.g. abnormal, high, below low threshold)
- resultProvider: Healthcare provider that provides the lab result / vital sign value
- resultReferenceRange: Reference range of the lab result / vital sign
- relatedCondition: Condition of the patient that causes the lab result / vital sign to be measured / observed
- comment: Further free text comments / information about the lab result / vital sign

An example `salus:Result` instance is provided below.

```
[ rdf:type salus:Result ;
  salus:relatedCondition
    [ rdf:type salus:Condition ;
      salus:problemCode
        [ rdf:type salus:cd ;
          salus:code "493" ;
          salus:codeSystem "2.16.840.1.113883.6.2" ;
          salus:codeSystemName "ICD-9-CM" ;
          salus:displayName "Asthma"
        ] ;
      salus:problemDate
        [ rdf:type salus:ivlTs ;
          salus:low "2003-08-01T00:00:00"^^xsd:dateTime
        ] ;
      salus:problemType
        [ rdf:type salus:cd ;
          salus:code "55607006" ;
          salus:codeSystem "2.16.840.1.113883.6.96" ;
          salus:codeSystemName "SNOMED CT" ;
          salus:displayName "Problem"
        ]
      ] ;
    ] ;
  salus:resultDateTime
    [ rdf:type salus:ivlTs ;
      salus:value "2010-04-07T14:30:00"^^xsd:dateTime
    ] ;
  salus:resultID
    [ rdf:type salus:ii ;
      salus:root "b2eb0423-5961-432e-8cc8-1458d778da84"
    ] ;
  salus:resultInterpretation
    [ rdf:type salus:cd ;
      salus:code "17621005" ;
      salus:codeSystem "2.16.840.1.113883.6.96" ;
      salus:codeSystemName "SNOMED CT" ;
      salus:displayName "Normal"
    ] ;
  salus:resultProvider
    [ rdf:type salus:HealthcareProvider ;
      salus:providerAddress
        [ rdf:type salus:addr ;
          salus:city "Milan" ;
          salus:country "Italy" ;
          salus:postalCode "20091" ;
          salus:state "MI" ;
          salus:streetAddressLine "Via Pietro Panzeri, No 12/7"
        ] ;
      salus:providerID
        [ rdf:type salus:ii ;
          salus:extension "54321678909" ;
          salus:root "2.16.840.1.113883.2.9.4.3.2"
        ] ;
      salus:providerOrganization
        [ rdf:type salus:OrganizationInformation ;
          salus:organizationID
            [ rdf:type salus:ii ;
              salus:extension "65432178902" ;
              salus:root "2.16.840.1.113883.2.9.4.3.2.4"
            ]
          ]
        ]
      ] ;
    ] ;
  ] ;
```

```

    ] ;
    salus:organizationName "Wellness Care Clinic"
  ] ;
salus:providerRole
  [ rdf:type salus:cd ;
    salus:code "309343006" ;
    salus:codeSystem "2.16.840.1.113883.6.96" ;
    salus:codeSystemName "SNOMED CT" ;
    salus:displayName "Physician"
  ] ;
salus:providerTelecom
  [ rdf:type salus:tele ;
    salus:use "WP" ;
    salus:value "tel:+390239003366"
  ] ;
foaf:familyName "Sebastino" ;
foaf:givenName "Tullia" ;
foaf:title "Dr."
] ;
salus:resultReferenceRange
  [ rdf:type salus:ivlPq ;
    salus:high
      [ rdf:type salus:pq ;
        salus:unit "g/dl" ;
        salus:value "16"
      ] ;
    salus:low
      [ rdf:type salus:pq ;
        salus:unit "g/dl" ;
        salus:value "12"
      ]
  ]
] ;
salus:resultType
  [ rdf:type salus:cd ;
    salus:code "30313-1" ;
    salus:codeSystem "2.16.840.1.113883.6.1" ;
    salus:codeSystemName "LOINC" ;
    salus:displayName "Hemoglobin:Mass Concentration:Point in time:Blood
arterial:Quantitative"
  ] ;
salus:resultValue
  [ rdf:type salus:Value ;
    salus:pqValue
      [ rdf:type salus:pq ;
        salus:unit "g/dl" ;
        salus:value "13.2"
      ]
  ]
]
].

```

### 3.2.10 SocialHistory

This is the entity model to represent the social history of the patient. It is composed of the following Common Data Elements:

- socialHistoryDate: Effective time interval of the social history
- socialHistoryObservationCode: Coded name of the social history (e.g. alcohol intake, tobacco use)
- socialHistoryObservationValue: Coded value / physical quantity value (i.e. value with unit) / string value of the social history
- comment: Further free text comments / information about the social history

An example `salus:SocialHistory` instance is provided below.

```
[ rdf:type salus:SocialHistory ;
  salus:socialHistoryDate
    [ rdf:type salus:ivlTs ;
      salus:low "1974-01-01T00:00:00"^^xsd:dateTime
    ] ;
  salus:socialHistoryObservationCode
    [ rdf:type salus:cd ;
      salus:code "160573003" ;
      salus:codeSystem "2.16.840.1.113883.6.96" ;
      salus:codeSystemName "SNOMED CT" ;
      salus:displayName "Alcohol intake"
    ] ;
  salus:socialHistoryObservationValue
    [ rdf:type salus:Value ;
      salus:pqValue
        [ rdf:type salus:pq ;
          salus:unit "{drink}/d" ;
          salus:value "1"
        ]
      ]
    ]
].
```

### 3.2.11 VitalSign

This is the entity model to represent the vital sign of the patient. It reuses the `salus:Result` entity that is used for the lab results of the patient. An example `salus:Result` instance corresponding to vital sign is provided below.

```
[ rdf:type salus:Result ;
  salus:relatedCondition
    [ rdf:type salus:Condition ;
      salus:problemCode
        [ rdf:type salus:cd ;
          salus:code "401.9" ;
          salus:codeSystem "2.16.840.1.113883.6.2" ;
          salus:codeSystemName "ICD-9-CM" ;
          salus:displayName "Unspecified essential hypertension"
        ] ;
      salus:problemDate
        [ rdf:type salus:ivlTs ;
          salus:low "2009-11-14T00:00:00"^^xsd:dateTime
        ] ;
      salus:problemType
        [ rdf:type salus:cd ;
          salus:code "55607006" ;
          salus:codeSystem "2.16.840.1.113883.6.96" ;
          salus:codeSystemName "SNOMED CT" ;
          salus:displayName "Problem"
        ]
      ]
    ] ;
  salus:resultDateTime
    [ rdf:type salus:ivlTs ;
      salus:value "2009-11-14T00:00:00"^^xsd:dateTime
    ] ;
  salus:resultID
    [ rdf:type salus:ii ;
      salus:root "662ad0f1-c309-4a97-9e94-c97b84ebab8e"
    ]
].
```

```

] ;
salus:resultInterpretation
[ rdf:type salus:cd ;
  salus:code "17621005" ;
  salus:codeSystem "2.16.840.1.113883.6.96" ;
  salus:codeSystemName "SNOMED CT" ;
  salus:displayName "Normal"
] ;
salus:resultProvider
[ rdf:type salus:HealthcareProvider ;
  salus:providerAddress
  [ rdf:type salus:addr ;
    salus:city "Milan" ;
    salus:country "Italy" ;
    salus:postalCode "20158" ;
    salus:state "MI" ;
    salus:streetAddressLine "Via Don Giovanni Minzoni, No 24"
  ] ;
  salus:providerID
  [ rdf:type salus:ii ;
    salus:extension "54321678906" ;
    salus:root "2.16.840.1.113883.2.9.4.3.2"
  ] ;
  salus:providerOrganization
  [ rdf:type salus:OrganizationInformation ;
    salus:organizationID
    [ rdf:type salus:ii ;
      salus:extension "65432178902" ;
      salus:root "2.16.840.1.113883.2.9.4.3.2.4"
    ] ;
    salus:organizationName "Wellness Care Clinic"
  ] ;
  salus:providerRole
  [ rdf:type salus:cd ;
    salus:code "309345004" ;
    salus:codeSystem "2.16.840.1.113883.6.96" ;
    salus:codeSystemName "SNOMED CT" ;
    salus:displayName "Chest Physicians"
  ] ;
  salus:providerTelecom
  [ rdf:type salus:tele ;
    salus:use "WP" ;
    salus:value "tel:+390239445566"
  ] ;
  foaf:familyName "Passerini" ;
  foaf:givenName "Fabiola" ;
  foaf:title "Dr."
] ;
salus:resultReferenceRange
[ rdf:type salus:ivlPq ;
  salus:high
  [ rdf:type salus:pq ;
    salus:unit "mm[Hg]" ;
    salus:value "100"
  ] ;
  salus:low
  [ rdf:type salus:pq ;
    salus:unit "mm[Hg]" ;
    salus:value "60"
  ]
] ;
] ;

```

```

salus:resultType
  [ rdf:type salus:cd ;
    salus:code "8462-4" ;
    salus:codeSystem "2.16.840.1.113883.6.1" ;
    salus:codeSystemName "LOINC" ;
    salus:displayName "Intravascular Diastolic"
  ] ;
salus:resultValue
  [ rdf:type salus:Value ;
    salus:pqValue
      [ rdf:type salus:pq ;
        salus:unit "mm[Hg]" ;
        salus:value "86"
      ]
    ]
  ]
].

```

### 3.2.12 Patient

This is the entity model to represent the patient of interest. It is composed of the following Common Data Elements (in addition to the SALUS entities that are described so far):

- ID: Identifier of the patient
- title: Title/prefix of the patient
- givenName: Given name of the patient
- familyName: Family name of the patient
- gender: Gender of the patient
- dateOfBirth: Birth date of the patient
- maritalStatus: Marital status of the patient
- religiousAffiliation: Religion of the patient
- race: Race of the patient
- ethnicity: Ethnicity of the patient
- placeOfBirth: Birth place of the patient
- address: Address (e.g. home, work place, postal) of the patient
- telecom: Telecommunication means details (i.e. telephone, fax, mobile phone, email) of the patient
- healthcareProvider: Health professional that takes place in the care of the patient
- providerOrganization: Healthcare provider organization that takes place in the care of the patient
- dataReporter: Human data reporter of the patient. It is a mandatory information in the case of reporting an Adverse Drug Event (ADE)
- and all previously described SALUS entities such as allergy, condition, procedure, etc.

An example salus:Patient instance is provided below.

```

[ rdf:type salus:patient Patient ;
  salus:ID
    [ rdf:type salus:ii ;
      salus:extension "54321678901" ;
      salus:root "2.16.840.1.113883.2.9.4.3.2"
    ] ;
  salus:address
    [ rdf:type salus:addr ;
      salus:use "HP" ;
      salus:city "Milan" ;
      salus:country "Italy" ;
      salus:postalCode "20142" ;
      salus:state "MI" ;
    ]
]

```

```

        salud:streetAddressLine
        "Via Lago di Nemi, No 4"
    ] ;
salud:allergy
    [ rdf:type salud:Allergy
      ];
salud:birthPlace
    [ rdf:type salud:addr ;
      salud:city "Biella" ;
      salud:country "Italy"
    ] ;
salud:condition
    [ rdf:type salud:Condition
      ] ;
salud:dataReporter
    [ rdf:type salud:DataReporter ;
      salud:reporterAddress
        [ rdf:type salud:addr ;
          salud:city "Milan" ;
          salud:country "Italy" ;
          salud:postalCode "20146" ;
          salud:state "MI" ;
          salud:streetAddressLine "Via Marostica, No 33/3"
        ] ;
      salud:reporterID
        [ rdf:type salud:ii ;
          salud:extension "54321678905" ;
          salud:root "2.16.840.1.113883.2.9.4.3.2"
        ] ;
      salud:reporterOrganization
        [ rdf:type salud:OrganizationInformation ;
          salud:organizationID
            [ rdf:type salud:ii ;
              salud:extension "65432178901" ;
              salud:root "2.16.840.1.113883.2.9.4.3.2.4"
            ] ;
          salud:organizationName "Good Health Clinic"
        ] ;
      salud:reporterQualification
        [ rdf:type salud:cd ;
          salud:code "1" ;
          salud:codeSystem "OID-TO-BE-DECIDED" ;
          salud:codeSystemName "E2B Data Reporter Qualification Codes" ;
          salud:displayName "Physician"
        ] ;
      salud:reporterTelecom
        [ rdf:type salud:tele ;
          salud:use "WP" ;
          salud:value "tel:+390239008811"
        ] ;
      foaf:familyName "Palladino" ;
      foaf:givenName "Ersilia" ;
      foaf:title "Dr."
    ] ;
salud:dateOfBirth "1956-07-08"^^xsd:date ;
salud:encounter
    [ rdf:type salud:Encounter
      ] ;
salud:ethnicity
    [ rdf:type salud:cd ;
      salud:code "2114-7" ;

```

```

        salus:codeSystem "2.16.840.1.113883.6.238" ;
        salus:codeSystemName "CDC Race and Ethnicity" ;
        salus:displayName "Italian"
    ] ;
salus:familyHistory
    [ rdf:type salus:FamilyHistory
    ] ;
salus:gender
    [ rdf:type salus:cd ;
      salus:code "F" ;
      salus:codeSystem "2.16.840.1.113883.5.1" ;
      salus:codeSystemName "AdministrativeGender" ;
      salus:displayName "Female"
    ] ;
salus:healthcareProvider
    [ rdf:type salus:HealthcareProvider
    ] ;
salus:immunization
    [ rdf:type salus:Immunization
    ] ;
salus:maritalStatus
    [ rdf:type salus:cd ;
      salus:code "M" ;
      salus:codeSystem "2.16.840.1.113883.5.2" ;
      salus:codeSystemName "MaritalStatus" ;
      salus:displayName "Married"
    ] ;
salus:medication
    [ rdf:type salus:Medication
    ] ;
salus:telecom
    [ rdf:type salus:tele ;
      salus:use "HP" ;
      salus:value "tel:+390239112233"
    ] ;
salus:pregnancy
    [ rdf:type salus:Pregnancy
    ] ;
salus:procedure
    [ rdf:type salus:Procedure
    ] ;
salus:providerOrganization
    [ rdf:type salus:OrganizationInformation ;
      salus:organizationID
        [ rdf:type salus:ii ;
          salus:extension "65432178901" ;
          salus:root "2.16.840.1.113883.2.9.4.3.2.4"
        ]
    ]
    ] ;
salus:race
    [ rdf:type salus:cd ;
      salus:code "2108-9" ;
      salus:codeSystem "2.16.840.1.113883.6.238" ;
      salus:codeSystemName "CDC Race and Ethnicity" ;
      salus:displayName "European"
    ] ;
salus:religiousAffiliation
    [ rdf:type salus:cd ;
      salus:code "1013" ;
      salus:codeSystem "2.16.840.1.113883.5.1076" ;
      salus:codeSystemName "ReligiousAffiliation" ;

```



```

        salus:displayName "Christian (non-Catholic, non-specific)"
    ] ;
    salus:result
    [ rdf:type salus:Result
    ] ;
    salus:socialHistory
    [ rdf:type salus:SocialHistory
    ] ;
    salus:vitalSign
    [ rdf:type salus:Result
    ] ;
    foaf:familyName "Cremona" ;
    foaf:givenName "Sabina"
].

```

### 3.3 SALUS Sub Entity Models

These entities are reusable parts of the entities mentioned in section 3.2.

#### 3.3.1 Time Interval

This is the entity model to represent time intervals. “ivlTs” stands for interval of timestamp. It is composed of the following properties:

- low: Low end of the time interval
- high: High end of the time interval
- value: Direct time value of the entity. It can be used to present a single time value when neither low nor high is present
- nullFlavor: An indicator that the time interval is null, together with the flavor (i.e. cause) of null

An example salus:ivlTs instance is provided below.

```

[ rdf:type salus:ivlTs ;
  salus:high "2009-03-31T00:00:00"^^xsd:dateTime ;
  salus:low "2009-03-31T00:00:00"^^xsd:dateTime
].

```

#### 3.3.2 Periodic Time Interval

This is the entity model to represent periodic time intervals; i.e. an interval of time that recurs periodically. “pivlTs” stands for periodic interval of timestamp. It is composed of the following properties:

- phase: Interval specifying the duration of each occurrence and anchoring the periodic time interval sequence at a certain point in time
- period: Time duration specifying the frequency at which the periodic time interval repeats
- value: Direct time value of the entity. It can be used to present a single time value when neither phase nor period is present
- nullFlavor: An indicator that the periodic time interval is null, together with the flavor (i.e. cause) of null

An example salus:pivlTs instance is provided below.

```

[ rdf:type salus:pivlTs ;
  salus:period
  [ rdf:type salus:pq ;
    salus:unit "h" ;
    salus:value "12"
  ]
].

```

```
]
].
```

### 3.3.3 Concept Descriptor

This is the entity model to represent the concept descriptors; i.e. coded values. It is composed of the following properties:

- code: Unique identifier / notation of the concept
- codeSystem: Unique identifier (ISO OIDs are preferred) of the concept scheme; i.e. the code system
- codeSystemName: Name of the code system
- codeSystemVersion: Version of the code system
- displayName: Designation corresponding to the code
- nullFlavor: An indicator that the concept descriptor is null, together with the flavor (i.e. cause) of null

An example `salus:cd` instance is provided below.

```
[ rdf:type salus:cd ;
  salus:code "235719002" ;
  salus:codeSystem "2.16.840.1.113883.6.96" ;
  salus:codeSystemName "SNOMED CT" ;
  salus:displayName "Food intolerance"
].
```

### 3.3.4 Address

This is the entity model to represent physical address information. It is composed of the following properties:

- use: Type of the address; e.g. home, work place, postal.
- streetAddressLine: Street information of the address
- postalCode: Postal code of the address
- city: City of the address
- state: State (region) of the address
- country: Country of the address
- nullFlavor: An indicator that the address is null, together with the flavor (i.e. cause) of null

An example `salus:addr` instance is provided below.

```
[ rdf:type salus:addr ;
  salus:city "Biella" ;
  salus:country "Italy"
  salus:postalCode "20158" ;
  salus:state "MI" ;
  salus:streetAddressLine "Via Don Giovanni Minzoni, No 24"
].
```

### 3.3.5 Healthcare Provider

This is the entity model to represent the health professional who participates in the care of the patient. It is composed of the following Common Data Elements:

- dateRange: Time interval that the healthcare provider is involved in the care of the patient
- providerID: Identifier of the healthcare provider
- providerRole: Role of the healthcare provider; e.g. GP, surgeon, nurse.
- title: Title/prefix of the healthcare provider

- givenName: Given name of the healthcare provider
- familyName: Family name of the healthcare provider
- providerAddress: Address (e.g. home, work place, postal) of the healthcare provider
- providerTelecom: Telecommunication means details (i.e. telephone, fax, mobile phone, email) of the healthcare provider
- providerOrganization: Organization that the healthcare provider is associated with
- providerPatientID: Healthcare provider specific identifier of the patient
- comment: Further free text comments / information about the healthcare provider

An example `salus:HealthcareProvider` instance is provided below.

```
[ rdf:type salus:HealthcareProvider ;
  salus:providerAddress
    [ rdf:type salus:addr
      ] ;
  salus:providerID
    [ rdf:type salus:ii
      ] ;
  salus:providerOrganization
    [ rdf:type salus:OrganizationInformation ;
      ] ;
  salus:providerRole
    [ rdf:type salus:cd ;
      ] ;
  salus:providerTelecom
    [ rdf:type salus:tele ;
      ] ;
  salus:dateRange
    [ rdf:type salus:ivlTs ;
      ] ;
  foaf:familyName "Passerini" ;
  foaf:givenName "Fabiola" ;
  foaf:title "Dr."
].
```

### 3.3.6 Identifier

This is the entity model to represent identifiers, i.e. instance identifiers. It is composed of the following properties:

- root: Unique identifier (ISO OIDs are preferred) of the set of identifiers; i.e. identifier scheme
- extension: Unique identifier within a set of identifiers
- nullFlavor: An indicator that the identifier is null, together with the flavor (i.e. cause) of null

An example `salus:ii` instance is provided below.

```
[ rdf:type salus:ii ;
  salus:extension "54321678906" ;
  salus:root "2.16.840.1.113883.2.9.4.3.2"
].
```

### 3.3.7 Organization Information

This is the entity model to represent the basic information about an organization, which does not have to be a healthcare provider organization. It is composed of the following Common Data Elements:

- organizationID: Identifier of the organization
- organizationAddress: Address (e.g. work place, postal) of the organization

- organizationTelecom: Telecommunication means details (i.e. telephone, fax, mobile phone, email) of the organization
- organizationName: Name of the organization

An example `salus:OrganizationInformation` instance is provided below.

```
[ rdf:type salus:OrganizationInformation ;
  salus:organizationAddress
    [ rdf:type salus:addr ;
      ] ;
  salus:organizationID
    [ rdf:type salus:ii ;
      ] ;
  salus:organizationName "Wellness Care Clinic"
].
```

### 3.3.8 Telecom

This is the entity model to represent the means of telecommunication details, i.e. telephone, fax, mobile phone, email. It is composed of the following properties:

- use: Type of the telecom information; e.g. telephone, fax, mobile phone, email.
- value: Value of the telecom information
- nullFlavor: An indicator that the telecom information is null, together with the flavor (i.e. cause) of null

An example `salus:tele` instance is provided below.

```
[ rdf:type salus:tele ;
  salus:use "WP" ;
  salus:value "tel:+390239445566"
].
```

### 3.3.9 Data Reporter

This is the entity model to represent the human data reporter of the patient. It is composed of the following Common Data Elements:

- reporterID: Identifier of the data reporter
- title: Title/prefix of the data reporter
- givenName: Given name of the data reporter
- familyName: Family name of the data reporter
- reporterQualification: Qualification of the data reporter. Suggested values are Physician; Pharmacist; Other Health Professional; Lawyer; Consumer or other non health professional.
- reporterOrganization: Organization that the data reporter is associated with
- reporterAddress: Address (e.g. home, work place, postal) of the data reporter
- reporterTelecom: Telecommunication means details (i.e. telephone, fax, mobile phone, email) of the data reporter

An example `salus:DataReporter` instance is provided below.

```
[ rdf:type salus:DataReporter ;
  salus:reporterAddress
    [ rdf:type salus:addr ;
      ] ;
  salus:reporterID
    [ rdf:type salus:ii ;
      ] ;
].
```

```

    ] ;
    salus:reporterOrganization
      [ rdf:type salus:OrganizationInformation ;
      ] ;
    salus:reporterQualification
      [ rdf:type salus:cd ;
      ] ;
    salus:reporterTelecom
      [ rdf:type salus:tele ;
      ] ;
    foaf:familyName "Palladino" ;
    foaf:givenName "Ersilia" ;
    foaf:title "Dr."
  ].

```

### 3.3.10 Physical Quantity

This is the entity model to represent the physical quantities. It is composed of the following properties:

- value: Value of the physical quantity
- unit: Unit of the physical quantity
- nullFlavor: An indicator that the physical quantity is null, together with the flavor (i.e. cause) of null

An example salus:pq instance is provided below.

```

[ rdf:type salus:pq ;
  salus:unit "1" ;
  salus:unit "g/dl" ;
  salus:value "12"
].

```

### 3.3.11 Medication Information

This is the entity model to represent the details, e.g. coded product name, coded active ingredient, free text brand name, of the medication. It is composed of the following Common Data Elements:

- codedProductName: Coded product name of the medication
- freeTextProductName: Free text product name of the medication
- codedActiveIngredient: Coded active ingredient of the medication
- codedBrandName: Coded brand name of the medication
- freeTextBrandName: Free text brand name of the medication
- drugManufacturer: Pharmaceuticals organization that manufactured the medication

An example salus:MedicationInformation instance is provided below.

```

[ rdf:type salus:MedicationInformation ;
  salus:codedActiveIngredient
    [ rdf:type salus:cd ;
      [ rdf:type salus:cd ;
        salus:code "R03AC02" ;
        salus:codeSystem "2.16.840.1.113883.6.73" ;
        salus:codeSystemName "ATC" ;
        salus:displayName "Salbutamol"
      ] ;
    ] ;
  salus:codedBrandName
    [ rdf:type salus:cd ;

```

```

    salus:code "795354" ;
    salus:codeSystem "2.16.840.1.113883.6.88" ;
    salus:codeSystemName "RxNorm" ;
    salus:displayName "Albuterol 1 MG/ML Inhalant Solution [Ventolin]"
  ] ;
  salus:codedProductName
  [ rdf:type salus:cd ;
    salus:code "245314" ;
    salus:codeSystem "2.16.840.1.113883.6.88" ;
    salus:codeSystemName "RxNorm" ;
    salus:displayName "Albuterol 1 MG/ML Inhalant Solution"
  ] ;
  salus:freeTextBrandName "Albuterol 1 MG/ML Inhalant Solution [Ventolin]"
;
  salus:freeTextProductName "Albuterol 1 MG/ML Inhalant Solution"
].

```

### 3.3.12 Order Information

This is the entity model to represent the details of the medication supply order, to supply a patient with medications, equivalent to the common 'prescription'. It is composed of the following Common Data Elements:

- orderNumber: Identifier of the order (i.e. prescription)
- orderingProvider: Healthcare provider that wrote this order
- fills: Number of times that the medication can be dispensed
- quantityOrdered: Amount of product that can be dispensed
- orderExpirationDateTime: Time when the ordering provider wrote the order
- orderDateTime: Time when the order is no longer valid

An example salus:OrderInformation instance is provided below.

```

[ rdf:type salus:OrderInformation ;
  salus:fills 2 ;
  salus:orderDateTime "2008-02-01T00:00:00"^^xsd:dateTime ;
  salus:orderNumber
  [ rdf:type salus:ii ;
  ] ;
  salus:orderingProvider
  [ rdf:type salus:HealthcareProvider ;
  ] ;
  salus:quantityOrdered
  [ rdf:type salus:pq ;
  ]
].

```

### 3.3.13 Physical Quantity Interval

This is the entity model to represent the physical quantity intervals. It is composed of the following properties:

- low: Low end of the physical quantity interval
- high: High end of the physical quantity interval
- center: Center of the physical quantity interval

An example salus:ivlPq instance is provided below.

```

[ rdf:type salus:ivlPq ;
  salus:high

```

```
[ rdf:type salus:pq ;
  salus:unit "g/dl" ;
  salus:value "16"
] ;
salus:low
[ rdf:type salus:pq ;
  salus:unit "g/dl" ;
  salus:value "12"
]
].
```

### 3.3.14 Value

This is the entity model to represent the coded values / physical quantity values (i.e. values with unit) / string values. It is composed of the following properties:

- stValue: String value
- pqValue: Physical quantity value
- cdValue: Coded value

An example salus:Value instance is provided below.

```
[ rdf:type salus:Value ;
  salus:pqValue
  [ rdf:type salus:pq ;
    salus:unit "g/dl" ;
    salus:value "13.2"
  ]
]
].
```

## 4 SALUS TERMINOLOGIES

In order to mediate between terminology systems we collected the following terminologies. Each of these terminologies is converted into an ontology using SKOS.

### 4.1 SKOS

SKOS<sup>7</sup> (Simple Knowledge Organization System) provides a model for expressing the basic structure and content of concept schemes such as thesauri, classification schemes, subject heading lists, taxonomies, folksonomies and other similar types of controlled vocabulary. As an application of the Resource Description Framework (RDF), SKOS allows concepts to be composed and published on the World Wide Web, linked with data on the Web and integrated into other concept schemes or ontologies.

In SKOS a terminology system is represented as a concept scheme and a set of concepts. URIs are assigned to each concept and the concept scheme itself. While representing the terminologies in the SALUS semantic resource set, where possible, the URIs assigned by NCBO Bioportal<sup>8</sup> are reused.

In addition to the concept URI to identify a concept, each concept has a notation property to represent the code of the concept in its terminology, making it possible to bridge the gap between RDF and existing operational systems.

Finally, SKOS provides properties for organizing concepts in concept hierarchies and for linking semantically related concepts from different concept schemes. This allows a reasoner to expand semantic queries to include equivalent concepts from other terminologies or to follow the hierarchical links to include more specific or broader concepts.

The example in figure 3 shows the hierarchy of cardiac disorders in both the MedDRA and SNOMED-CT concept schemes, expressed using the `skos:broader` property. Mappings between similar concepts in both concept schemes are stated using the `skos:exactMatch` property.

---

<sup>7</sup> Simple Knowledge Organization System, <http://www.w3.org/2004/02/skos/>

<sup>8</sup> <http://bioportal.bioontology.org/>



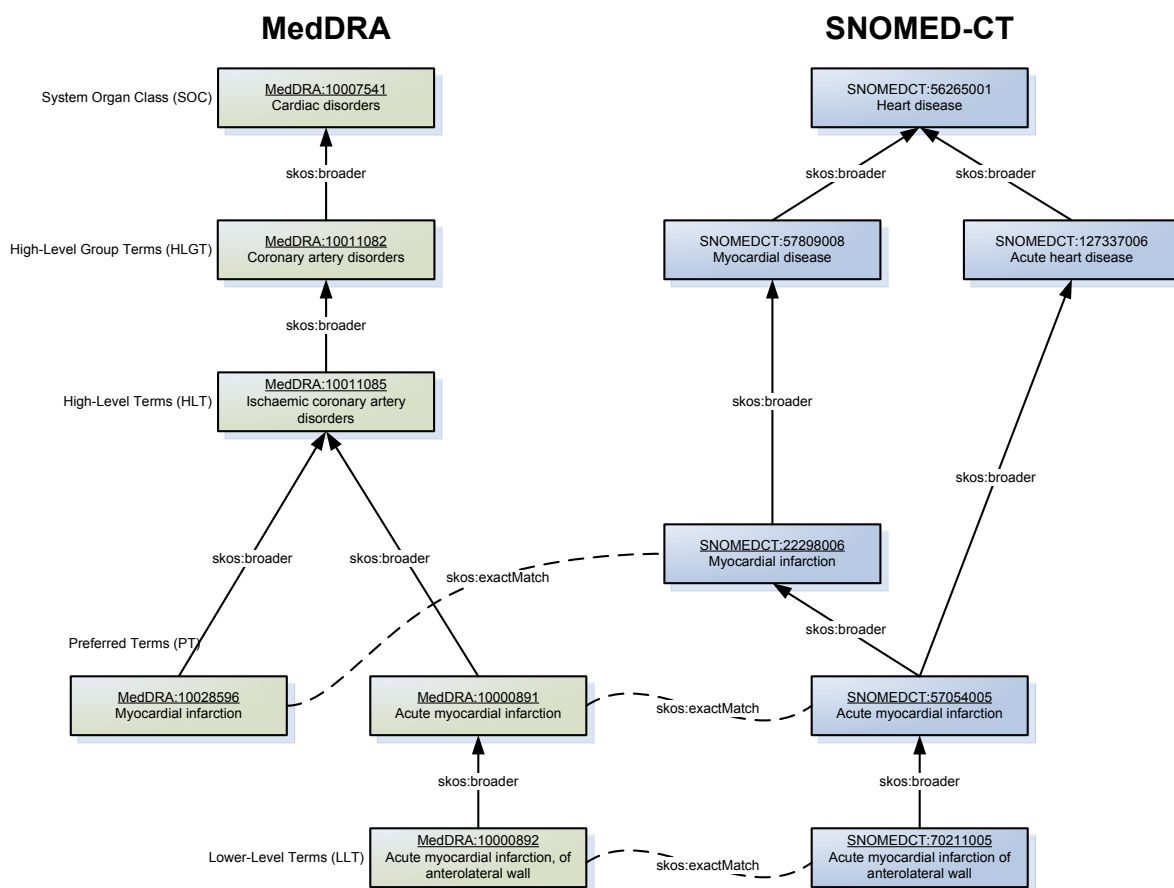


Figure 3 Hierarchical relations and mapping relations in SKOS

## 4.2 ATC

The Anatomical Therapeutic Chemical (ATC) Classification System is used for the classification of drugs. It is controlled by the WHO Collaborating Centre for Drug Statistics Methodology. ATC divides drugs into different groups according to the organ or system on which they act and/or their therapeutic and chemical characteristics. Each bottom-level ATC code stands for a pharmaceutically used substance, or a combination of substances, in a single indication (or use). This means that one drug can have more than one code. On the other hand, several different brands share the same code if they have the same active substance and indications.

The semantic representation of the ATC terminology as a SKOS ConceptScheme is provided below. Since ATC is already available in BioPortal and hence has been assigned a URI, we use the same URI.

```
@prefix foaf:    <http://xmlns.com/foaf/0.1/> .
@prefix iso:    <uri:iso.org:9834#> .
@prefix rdfs:   <http://www.w3.org/2000/01/rdf-schema#> .
@prefix skos:   <http://www.w3.org/2004/02/skos/core#> .
```

```
<http://purl.bioontology.org/ontology/ATC>
  a skos:ConceptScheme ;
  rdfs:label "WHOATC" ;
  foaf:name "Anatomical Therapeutic Chemical (ATC) Classification"@en ;
  skos:hasTopConcept <http://purl.bioontology.org/ontology/ATC/C>;
  iso:oid "2.16.840.1.113883.6.73" .
```

The example below shows how the substance “Nifedipine” could be modelled as a SKOS concept scheme. ATC is available as concept scheme in Bioportal, but is marked as private.

```
<http://purl.bioontology.org/ontology/ATC/C>
  a skos:Concept;
  skos:inScheme <http://purl.bioontology.org/ontology/ATC>;
  skos:prefLabel "Cardiovascular system"@en;
  skos:notation "C".

<http://purl.bioontology.org/ontology/ATC/C08>
  a skos:Concept;
  skos:inScheme <http://purl.bioontology.org/ontology/ATC>;
  skos:broader <http://purl.bioontology.org/ontology/ATC/C>;
  skos:prefLabel "Calcium channel blockers"@en;
  skos:notation "C08".

<http://purl.bioontology.org/ontology/ATC/C08C>
  a skos:Concept;
  skos:inScheme <http://purl.bioontology.org/ontology/ATC>;
  skos:broader <http://purl.bioontology.org/ontology/ATC/C08>;
  skos:prefLabel "Selective calcium channel blockers with mainly
vascular effects"@en;
  skos:notation "C08C".

<http://purl.bioontology.org/ontology/ATC/C08CA>
  a skos:Concept;
  skos:inScheme <http://purl.bioontology.org/ontology/ATC>;
  skos:broader <http://purl.bioontology.org/ontology/ATC/C08C>;
  skos:prefLabel "Dihydropyridine derivatives"@en;
  skos:notation "C08CA".

<http://purl.bioontology.org/ontology/ATC/C08CA05>
  a skos:Concept;
  skos:inScheme <http://purl.bioontology.org/ontology/ATC>;
  skos:broader <http://purl.bioontology.org/ontology/ATC/C08CA>;
  skos:prefLabel "Nifedipine"@en;
  skos:notation "C08CA05".
```

### 4.3 MedDRA

Medical Dictionary for Regulatory Activities (MedDRA) is a medical terminology used to classify adverse event information associated with the use of biopharmaceuticals and other medical products (e.g., medical devices and vaccines). The purpose of MedDRA is to describe steps of drug development and regulatory issues about human exposure. It includes terms for the description of adverse drug reactions, indications, signs and symptoms, family history, investigations and surgical procedures. Nowadays this terminology is used for recording and reporting adverse drug event data in most countries. MedDRA terms are organized in 5 levels: System Organ Class (SOC), High Level Group Terms (HLGT), High Level Terms (HLT), Preferred Terms (PT) and Low Level Terms (LLT). More information about MedDRA can be found in SALUS D3.2.1 - Survey of the State of the Art.

In our semantic resource set, we make use of version 13.0 of MedDRA. All terms at the SOC, HLGT, HLT and PT levels are included; LLT terms are discarded since they are not required by our pilot applications. There are 26 SOC, 335 HLGT, 1709 HLT and 18786 PT terms. In our pilot applications, MedDRA is almost always a target terminology system.

Semantic representation of the MedDRA terminology as a SKOS ConceptScheme is provided below. Since MedDRA (version 12.0) is already available in BioPortal and hence has been assigned a URI, we use the same URI.

```

@prefix MDR:      <http://purl.bioontology.org/ontology/MDR/> .
@prefix foaf:    <http://xmlns.com/foaf/0.1/> .
@prefix iso:     <uri:iso.org:9834#> .
@prefix rdfs:    <http://www.w3.org/2000/01/rdf-schema#> .
@prefix skos:    <http://www.w3.org/2004/02/skos/core#> .

<http://purl.bioontology.org/ontology/MDR>
  rdf:type skos:ConceptScheme ;
  rdfs:label "MedDRA" ;
  foaf:name "Medical Dictionary for Regulatory Activities Terminology,
Version 13.0" ;
  iso:oid "2.16.840.1.113883.6.163" .

```

Similarly, the MedDRA terms are represented via properties from the SKOS vocabulary. Again for the individual MedDRA terms, the URIs that are assigned by BioPortal are used. Unlike BioPortal, we stick to the SKOS vocabulary, and on top, we defined the “MDR:level” property for representing the original MedDRA level information. Below, the SOC, HLT, HLT and PT terms hierarchy that leads to “Myocardial infarction” is provided as example SKOS Concepts:

```

<http://purl.bioontology.org/ontology/MDR/10007541>
  a      skos:Concept ;
  MDR:level "SOC" ;
  skos:inScheme <http://purl.bioontology.org/ontology/MDR> ;
  skos:notation "10007541" ;
  skos:prefLabel "Cardiac disorders" .

<http://purl.bioontology.org/ontology/MDR/10011082>
  a      skos:Concept ;
  MDR:level "HLGT" ;
  skos:broader <http://purl.bioontology.org/ontology/MDR/10007541> ;
  skos:inScheme <http://purl.bioontology.org/ontology/MDR> ;
  skos:notation "10011082" ;
  skos:prefLabel "Coronary artery disorders" .

<http://purl.bioontology.org/ontology/MDR/10011085>
  a      skos:Concept ;
  MDR:level "HLT" ;
  skos:broader <http://purl.bioontology.org/ontology/MDR/10011082> ;
  skos:inScheme <http://purl.bioontology.org/ontology/MDR> ;
  skos:notation "10011085" ;
  skos:prefLabel "Ischaemic coronary artery disorders" .

<http://purl.bioontology.org/ontology/MDR/10028596>
  a      skos:Concept ;
  MDR:level "PT" ;
  skos:broader <http://purl.bioontology.org/ontology/MDR/10011085> ,
<http://purl.bioontology.org/ontology/MDR/10065875> ;
  skos:inScheme <http://purl.bioontology.org/ontology/MDR> ;
  skos:notation "10028596" ;
  skos:prefLabel "Myocardial infarction" .

```

#### 4.4 SNOMED CT

Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT) is a broad clinical terminology (the 2011 version includes more than 311,000 concepts), which is sometimes considered as an ontology because of the systematic and logical mode of representations of semantics it promotes. SNOMED CT provides codes, terms, synonyms and definitions covering diseases, findings, procedures, microorganisms, substances, etc. It is one of the most comprehensive, multilingual

clinical healthcare terminologies in the World. More information about SNOMED CT can be found in SALUS D3.2.1 - Survey of the State of the Art.

In our semantic resource set, for the moment we make use of only the “Clinical finding” sub-hierarchy of SNOMED CT. We retrieved this sub-hierarchy from BioPortal and then fine-tuned it to get rid of unnecessary properties. There are 97139 SNOMED CT codes in our semantic resource set. In our pilot applications, SNOMED CT is usually neither a source nor target terminology system; but an intermediary (hub) terminology system to link source codes to target codes through mappings and other semantic relationships.

Semantic representation of the SNOMED CT terminology as a SKOS ConceptScheme is provided below. Since SNOMED CT is already available in BioPortal and hence has been assigned a URI, we use the same URI.

```
<http://purl.bioontology.org/ontology/SNOMEDCT>
  rdf:type skos:ConceptScheme ;
  rdfs:label "SNOMED CT" ;
  foaf:name "Systematized Nomenclature of Medicine--Clinical Terms" ;
  iso:oid "2.16.840.1.113883.6.96" .
```

Similarly, the SNOMED CT codes are represented via properties from the SKOS vocabulary. Again for the individual SNOMED CT codes, the URIs that are assigned by BioPortal are used. Unlike BioPortal, we totally stick to the SKOS vocabulary. Below, a tiny excerpt from the SNOMED CT hierarchy that starts from “Headache disorder” and ends with “Migraine with aura” is provided:

```
<http://purl.bioontology.org/ontology/SNOMEDCT/230461009>
  rdf:type skos:Concept ;
  skos:altLabel "Headache disorder (disorder)" ;
  skos:broader
<http://purl.bioontology.org/ontology/SNOMEDCT/373673007> ,
<http://purl.bioontology.org/ontology/SNOMEDCT/118934005> ;
  skos:inScheme <http://purl.bioontology.org/ontology/SNOMEDCT> ;
  skos:notation "230461009" ;
  skos:prefLabel "Headache disorder" .

<http://purl.bioontology.org/ontology/SNOMEDCT/128187005>
  rdf:type skos:Concept ;
  skos:altLabel "Vascular headache (disorder)" ;
  skos:broader
<http://purl.bioontology.org/ontology/SNOMEDCT/230461009> ,
<http://purl.bioontology.org/ontology/SNOMEDCT/27550009> ;
  skos:inScheme <http://purl.bioontology.org/ontology/SNOMEDCT> ;
  skos:notation "128187005" ;
  skos:prefLabel "Vascular headache" .

<http://purl.bioontology.org/ontology/SNOMEDCT/37796009>
  rdf:type skos:Concept ;
  skos:altLabel "Migraine (disorder)" , "Migraine, NOS" ;
  skos:broader
<http://purl.bioontology.org/ontology/SNOMEDCT/128187005> ;
  skos:inScheme <http://purl.bioontology.org/ontology/SNOMEDCT> ;
  skos:notation "37796009" ;
  skos:prefLabel "Migraine" .

<http://purl.bioontology.org/ontology/SNOMEDCT/4473006>
  rdf:type skos:Concept ;
  skos:altLabel "Migraine with aura (disorder)" , "Classical migraine"
;
```

```

    skos:broader
<http://purl.bioontology.org/ontology/SNOMEDCT/280128006> ,
<http://purl.bioontology.org/ontology/SNOMEDCT/37796009> ,
<http://purl.bioontology.org/ontology/SNOMEDCT/81308009> ;
    skos:inScheme <http://purl.bioontology.org/ontology/SNOMEDCT> ;
    skos:notation "4473006" ;
    skos:prefLabel "Migraine with aura" .

```

## 4.5 ICD-10

International Statistical Classification of Diseases and Related Health Problems, 10th rev. (ICD-10) is a medical classification list by the World Health Organization (WHO). It codes for diseases, signs and symptoms, abnormal findings, complaints, social circumstances, and external causes of injury or diseases.

In our semantic resource set, we have the semantic representation of the complete ICD-10 hierarchy. We retrieved these from BioPortal and then fine-tuned it to get rid of unnecessary properties. There are 12318 ICD-10 codes in our semantic resource set. In our pilot applications, ICD-10 is usually neither a source nor target terminology system; but an intermediary (hub) terminology system to link source codes to target codes through mappings and other semantic relationships. It is necessary especially for mappings to ICD-10 German Modification (ICD-10-GM), which is used in Technical University of Dresden (TUD).

Semantic representation of the ICD-10 terminology as a SKOS ConceptScheme is provided below. Since ICD-10 is already available in BioPortal and hence has been assigned a URI, we use the same URI.

```

<http://purl.bioontology.org/ontology/ICD10>
  rdf:type skos:ConceptScheme ;
  rdfs:label "ICD-10" ;
  foaf:name "International Statistical Classification of Diseases and
Related Health Problems. 10th rev." ;
  iso:oid "2.16.840.1.113883.6.3" .

```

Similarly, the ICD-10 codes are represented via properties from the SKOS vocabulary. Again for the individual ICD-10 codes, the URIs that are assigned by BioPortal are used. Unlike BioPortal, we totally stick to the SKOS vocabulary. Below, a tiny excerpt from the ICD-10 hierarchy that starts from “Diabetes mellitus” and ends with “Insulin-dependent diabetes mellitus with coma” is provided:

```

<http://purl.bioontology.org/ontology/ICD10/E10-E14.9>
  a      skos:Concept ;
  skos:broader <http://purl.bioontology.org/ontology/ICD10/E00-E90.9> ;
  skos:inScheme <http://purl.bioontology.org/ontology/ICD10> ;
  skos:notation "E10-E14.9" ;
  skos:prefLabel "Diabetes mellitus" .

```

```

<http://purl.bioontology.org/ontology/ICD10/E10>
  a      skos:Concept ;
  skos:broader <http://purl.bioontology.org/ontology/ICD10/E10-E14.9> ;
  skos:inScheme <http://purl.bioontology.org/ontology/ICD10> ;
  skos:notation "E10" ;
  skos:prefLabel "Insulin-dependent diabetes mellitus" .

```

```

<http://purl.bioontology.org/ontology/ICD10/E10.0>
  a      skos:Concept ;
  skos:broader <http://purl.bioontology.org/ontology/ICD10/E10> ;
  skos:inScheme <http://purl.bioontology.org/ontology/ICD10> ;
  skos:notation "E10.0" ;

```

```
skos:prefLabel "Insulin-dependent diabetes mellitus with coma" .
```

## 4.6 ICD-10-GM

Internationale statistische Klassifikation der Krankheiten und verwandter Gesundheitsprobleme, 10. Revision, German Modification (ICD-10-GM) is the German modification of ICD-10. It is the official classification for coding of diagnoses in outpatient and inpatient care in Germany, and is used in the University Hospital of Dresden (UKD) ORBIS system.

The Deutsche Institute Medizinische Dokumentation Information (DIMDI) publishes a new version of ICD-10-GM each year; these different ICD-10-GM versions are classified by the year they are published. The ORBIS system in UKD contains the ICD-10GM codes from the different versions and we generate the ICD-10-GM terminology from what is stored in ORBIS. In the pilot application, the ICD-10-GM is the source terminology used in UKD.

The different versions are specified as distinct skos:ConceptSchemes as in the example shown below.

```
@prefix ICD10GM: <http://www.salusproject.eu/terminology/ICD10GM/> .
@prefix clisko: <http://www.agfa.com/w3c/2009/clinicalSKOSSchemes#> .
@prefix iso: <uri:iso.org:9834#> .

<http://www.salusproject.eu/terminology/ICD10GM/2007>
  rdf:type skos:ConceptScheme ;
  rdfs:label "icd10gm2007" ;
  iso:oid "1.2.276.0.76.5.318" .
```

We also use the SKOS vocabulary to represent the concepts of ICD-10-GM. We record the ICD-10\_GM version of a concept, by stating the version specific concept scheme. The specified code in the ICD-10-GM coding system is recorded using skos:notation. We also use skos:broader to represent the hierarchical relationship between concepts, as in the excerpt shown below.

```
ICD10GM:I21
  rdf:type skos:Concept ;
  skos:inScheme clisko:icd10gm ,
<http://www.salusproject.eu/terminology/ICD10GM/2012> ,
<http://www.salusproject.eu/terminology/ICD10GM/2005> ,
<http://www.salusproject.eu/terminology/ICD10GM/2008> ,
<http://www.salusproject.eu/terminology/ICD10GM/2007> ,
<http://www.salusproject.eu/terminology/ICD10GM/2011> ,
<http://www.salusproject.eu/terminology/ICD10GM/2004> ,
<http://www.salusproject.eu/terminology/ICD10GM/2010> ,
<http://www.salusproject.eu/terminology/ICD10GM/2006> ,
<http://www.salusproject.eu/terminology/ICD10GM/2009> ;
  skos:notation "I21.-"^^clisko:icd10gmDT ;
  skos:prefLabel "Akuter Myokardinfarkt"@de .

<http://www.salusproject.eu/terminology/ICD10GM/I21.1>
  rdf:type skos:Concept ;
  skos:broader ICD10GM:I21 ;
  skos:inScheme <http://www.salusproject.eu/terminology/ICD10GM/2005> ,
<http://www.salusproject.eu/terminology/ICD10GM/2007> ,
<http://www.salusproject.eu/terminology/ICD10GM/2009> ,
<http://www.salusproject.eu/terminology/ICD10GM/2010> ,
<http://www.salusproject.eu/terminology/ICD10GM/2004> ,
<http://www.salusproject.eu/terminology/ICD10GM/2012> ,
<http://www.salusproject.eu/terminology/ICD10GM/2008> , clisko:icd10gm ,
<http://www.salusproject.eu/terminology/ICD10GM/2006> ,
<http://www.salusproject.eu/terminology/ICD10GM/2011> ;
  skos:notation "I21.1"^^clisko:icd10gmDT ;
```

```
skos:prefLabel "Akuter transmuraler Myokardinfarkt der Hinterwand"@de
```

## 4.7 ICD-9-CM

International Classification of Diseases, 9th Rev., Clinical Modification (ICD-9-CM) is an adaption created by the U.S. National Center for Health Statistics and used in assigning diagnostic and procedure codes associated with inpatient, outpatient, and physician office utilization in the United States. ICD-9-CM is based on the original ICD-9 by WHO, but provides additional morbidity detail.

In our semantic resource set, we have the semantic representation of the complete ICD-9-CM, version 2007 hierarchy. We retrieved these from BioPortal and then fine-tuned it to get rid of unnecessary properties. There are 21669 ICD-9-CM codes in our semantic resource set. In our pilot applications, ICD-9-CM is a source terminology system that is used within the Lombardy Region.

Semantic representation of the ICD-9-CM terminology as a SKOS ConceptScheme is provided below. Since ICD-9-CM is already available in BioPortal and hence has been assigned a URI, we use the same URI.

```
<http://purl.bioontology.org/ontology/ICD9CM>
  rdf:type skos:ConceptScheme ;
  rdfs:label "ICD-9-CM" ;
  foaf:name "International Classification of Diseases, Ninth Revision,
  Clinical Modification" ;
  iso:oid "2.16.840.1.113883.6.2" .
```

Similarly, the ICD-9-CM codes are represented via properties from the SKOS vocabulary. Again for the individual ICD-9-CM codes, the URIs that are assigned by BioPortal are used. Unlike BioPortal, we totally stick to the SKOS vocabulary. Below, a tiny excerpt from the ICD-9-CM hierarchy that starts from “Overweight, obesity and other hyperalimentation” and ends with “Morbid obesity” is provided:

```
<http://purl.bioontology.org/ontology/ICD9CM/278>
  a      skos:Concept ;
  skos:broader <http://purl.bioontology.org/ontology/ICD9CM/270-279.99>
;
  skos:inScheme <http://purl.bioontology.org/ontology/ICD9CM> ;
  skos:notation "278" ;
  skos:prefLabel "Overweight, obesity and other hyperalimentation" .
```

```
<http://purl.bioontology.org/ontology/ICD9CM/278.0>
  a      skos:Concept ;
  skos:broader <http://purl.bioontology.org/ontology/ICD9CM/278> ;
  skos:inScheme <http://purl.bioontology.org/ontology/ICD9CM> ;
  skos:notation "278.0" ;
  skos:prefLabel "Overweight and obesity" .
```

```
<http://purl.bioontology.org/ontology/ICD9CM/278.01>
  a      skos:Concept ;
  skos:altLabel "MORBID OBESITY" ;
  skos:broader <http://purl.bioontology.org/ontology/ICD9CM/278.0> ;
  skos:inScheme <http://purl.bioontology.org/ontology/ICD9CM> ;
  skos:notation "278.01" ;
  skos:prefLabel "Morbid obesity" .
```

## 4.8 HL7 AdministrativeGender

The HL7 AdministrativeGender code system / value set is one of the most simple and widely known vocabularies for representing gender information in a coded manner.

It has 3 codes only for defining male, female and undifferentiated. In our pilot applications, it is used both as a hub and target terminology system. Its semantic representation as a SKOS ConceptScheme is provided below.

```
@prefix HL7:
<http://purl.bioontology.org/ontology/HL7/AdministrativeGender/> .
@prefix xsd:      <http://www.w3.org/2001/XMLSchema#> .

<http://purl.bioontology.org/ontology/HL7/AdministrativeGender>
  rdf:type skos:ConceptScheme ;
  rdfs:label "AdministrativeGender" ;
  foaf:name "HL7 Administrative Gender" ;
  iso:oid "2.16.840.1.113883.5.1" .
```

Similarly, the codes are represented via properties from the SKOS vocabulary. All 3 codes are provided below:

```
HL7:M
  rdf:type skos:Concept ;
  skos:inScheme
<http://purl.bioontology.org/ontology/HL7/AdministrativeGender> ;
  skos:notation "M" ;
  skos:prefLabel "Male" .
```

```
HL7:F
  rdf:type skos:Concept ;
  skos:inScheme
<http://purl.bioontology.org/ontology/HL7/AdministrativeGender> ;
  skos:notation "F" ;
  skos:prefLabel "Female" .
```

```
HL7:UN
  rdf:type skos:Concept ;
  skos:inScheme
<http://purl.bioontology.org/ontology/HL7/AdministrativeGender> ;
  skos:notation "UN" ;
  skos:prefLabel "Undifferentiated" .
```



## 5 SOURCE CONTENT ENTITY MODELS

This section describes the content entity models of both the Lombardia Informatica (LISPA) and University Hospital of Dresden (UKD) data sources used in the SALUS project.

### 5.1 CDA/CCD Content Entity Model

The Lombardy Region provides the medical summaries of the eligible patient(s) as a response to queries through the entry level HL7 CDA R2 templates, which simply reuse the existing IHE Patient Care Coordination (PCC) and HL7/ASTM Continuity of Care Document (CCD) templates. These templates and how they are used within SALUS are explained in detail in D4.1.1 - SALUS Content models for the Functional Interoperability Profiles for Post Market Safety Studies - R1. They are very similar to entities of the SALUS CIM, because they are based on common efforts such as ASTM Continuity of Care Record (CCR).

The CDA/CCD Content Entity Model is the RDF representation of the HL7 CDA R2 schema, automatically converted from the XSD of the CDA document by the SALUS Ontmalizer tool. We have developed a tool, namely Ontmalizer, which handles comprehensive transformations of XML Schemas (XSD) and XML data to RDF/OWL automatically. Through this tool, it is possible to create an OWL representation of XML Schemas, and XML instances that comply with such XML Schemas. More information about Ontmalizer can be found in D4.4.1 - SALUS Semantic Mediation Framework - R1. As a result the CDA/CCD Content Entity Model represented in N3 syntax is available at <http://www.salusproject.eu/ontology/hl7-cda-ontology.n3>.

Similarly, the Ontmalizer is able to create a RDF representation of a CDA/CCD instance in its native XML representation. The created RDF representation conforms to the CDA/CCD Content Entity Model. A simple CDA/CCD observation instance in native XML is provided below:

```
<observation classCode="OBS" moodCode="EVN">
  <code code="55607006" displayName="Problem"
codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT"/>
  <value xsi:type="CD" code="410.0" displayName="Acute myocardial
infarction, of anterolateral wall" codeSystem="2.16.840.1.113883.6.2"
codeSystemName="ICD-9-CM">
    <originalText>Acute myocardial infarction, of anterolateral
wall</originalText>
  </value>
</observation>
```

Through Ontmalizer, the following one-to-one semantic correspondence of this observation instance is created automatically:

```
<http://www.srdc.com.tr/ontmalizer/instance#INS7778722_POCD_MT000040.Observation_1>
  a <urn:hl7-org:v3#POCD_MT000040.Observation> ;
  v3:code
    [ a v3:CD ;
      v3:code "55607006"^^v3:csDatatype ;
      v3:codeSystem "2.16.840.1.113883.6.96"^^v3:uidDatatype ;
      v3:codeSystemName "SNOMED CT"^^v3:stDatatype ;
      v3:displayName "Problem"^^v3:stDatatype
    ] ;
  v3:value
    [ a v3:CD ;
      v3:code "410.0"^^v3:csDatatype ;
      v3:codeSystem "2.16.840.1.113883.6.2"^^v3:uidDatatype ;
```

```

v3:codeSystemName "ICD-9-CM"^^v3:stDatatype ;
v3:displayName "Acute myocardial infarction, of anterolateral
wall"^^v3:stDatatype;
v3:originalText
  [ a v3:ED ;
    v3:textContent "Acute myocardial infarction, of anterolateral
wall"^^xsd:string
  ]
] .

```

As a more detailed example, in APPENDIX 1, an example medical summary in native HL7 CDA format using PCC/CCD templates is provided. This example has basically patient demographics, condition and medication data. Then, in APPENDIX 2, the one-to-one semantic correspondence of the CCD instance provided in APPENDIX 1 is presented. We refer to the `salus-cda-instance.n3` sample file for more information. We also refer to deliverable 4.1.1 for an explanation of the CDA/CCD document content.

## 5.2 ORBIS Content Entity Models

This section provides an overview of Agfa HealthCare's ORBIS system content entity models expressed using the proprietary ORBIS Content Model Ontology.

### 5.2.1 Diagnosis

Diagnosis information in ORBIS is stored in a number of relation tables and the ICD-10-GM coding system is used to specify the diagnosis. Figure 4 shows the ORBIS Diagnosis Content Entity Model, represented with the ORBIS Content Model Ontology.

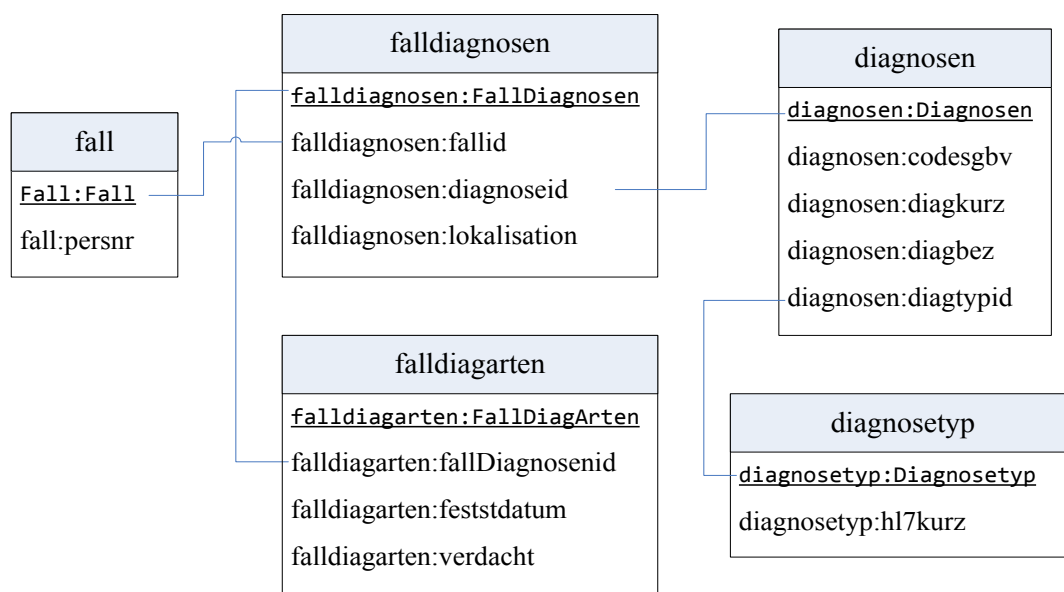


Figure 4 ORBIS Content Entity Model for Diagnosis

The ORBIS Content Model Ontology is generated based on the database schema of the ORBIS database. The database tables are converted to classes in the ORBIS Content Model Ontology, the columns in tables are converted to properties. The following shows an extract of the ORBIS Falldiagnosen Content Model Ontology:

```

@prefix falldiagnosen: <http://www.agfa.com/w3c/orbis/orbis-
schema/FallDiagnosen#>.

```

```

falldiagnosen:FallDiagnosen a rdfs:Class;

```

```

    rdfs:comment "OS_KERN.FALL_DIAGNOSEN".

falldiagnosen:diagnoseid a rdf:Property;
    rdfs:label "DIAGNOSEID";
    rdfs:comment "OS_KERN.FALL_DIAGNOSEN.DIAGNOSEID";
    rdfs:domain falldiagnosen:FallDiagnosen;
    rdfs:range diagnosen:Diagnosen.

falldiagnosen:fallid a rdf:Property;
    rdfs:label "FALLID";
    rdfs:comment "OS_KERN.FALL_DIAGNOSEN.FALLID";
    rdfs:domain falldiagnosen:FallDiagnosen;
    rdfs:range fall:Fall.

falldiagnosen:lokalisation a rdf:Property;
    rdfs:label "LOKALISATION";
    rdfs:comment "OS_KERN.FALL_DIAGNOSEN.LOKALISATION";
    rdfs:domain falldiagnosen:FallDiagnosen.

```

The falldiagnosen:FallDiagnosen class indicates this ontology is generated from the FallDiagnosen table. Diagnoseid, fallid, and lokalisation are columns in this table and thus corresponding properties are generated. Diagnoseid and fallid are both Foreign Keys so that the range of these two properties are classes, which represent the foreign table. The range of lokalisation is not specified, which is equivalent to plain literal.

In Figure 4 the ontology class 'Fall' stands for medical case, which can be further linked to a 'Patient' class (with its property fall:persnr). Diagnosen stores the standard ICD-10-GM coding, where diagnosen:codesgbv represents the ICD-10-GM diagnosis code, and diagnosen:diagbez represents the diagnosis name. As the ICD-10-GM coding distinguishes different versions for each year, such version information is stored in Diagnosetyp. In ORBIS, diagnosis is assigned to each medical case and the Falldiagnosen table (ontology) records such assignments. Additional information of a diagnosis, e.g. diagnosis date, is kept in Falldiagarten.

The ORBIS Diagnosis Content Entity Model is thus derived as:

```

?fda falldiagarten:fallDiagnosenid ?fd.
?fda falldiagarten:feststdatum ?diagDate.
?fda falldiagarten:verdacht ?verdacht.

?fd a falldiagnosen:FallDiagnosen.
?fd falldiagnosen:fallid ?fall.
?fd falldiagnosen:diagnoseid ?primaryDiag.
?fd falldiagnosen:lokalisation ?lokalisation.

?fall fall:persnr ?patient.

?primaryDiag diagnosen:codesgbv ?diagCode.
?primaryDiag diagnosen:diagkurz ?diagkurz.
?primaryDiag diagnosen:diagbez ?diagName.
?primaryDiag diagnosen:diagtypid ?diagtyp.

?diagtyp diagnosetyp:hl7kurz ?diagnosisType.

```

A sample ORBIS Diagnosis Content Entity, returned by the ORBIS SPARQL Endpoint after executing the Diagnosis SPARQL Query mentioned in APPENDIX 3:

```

<https://agfa.com/orbis/SALUS/resource/Fall/43865001#this>
<http://www.agfa.com/w3c/orbis/orbis-schema/Fall#persnr>
<https://agfa.com/orbis/SALUS/resource/Patient/883001#this>.

```

```

<https://agfa.com/orbis/SALUS/resource/FallDiagnosen/564800001#this>
<http://www.agfa.com/w3c/orbis/orbis-schema/FallDiagnosen#fallid>
<https://agfa.com/orbis/SALUS/resource/Fall/43865001#this> .

<https://agfa.com/orbis/SALUS/resource/FallDiagnosen/564800001#this>
<http://www.agfa.com/w3c/orbis/orbis-schema/FallDiagnosen#diagnoseid>
<https://agfa.com/orbis/SALUS/resource/Diagnosen/726450001#this> .

<https://agfa.com/orbis/SALUS/resource/FallDiagnosen/564800001#this>
<http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
<http://www.agfa.com/w3c/orbis/orbis-schema/FallDiagnosen#FallDiagnosen> .

<https://agfa.com/orbis/SALUS/resource/FallDiagArten/564800001#this>
<http://www.agfa.com/w3c/orbis/orbis-schema/FallDiagArten#fallDiagnosenid>
<https://agfa.com/orbis/SALUS/resource/FallDiagnosen/564800001#this> .

<https://agfa.com/orbis/SALUS/resource/FallDiagArten/564800001#this>
<http://www.agfa.com/w3c/orbis/orbis-schema/FallDiagArten#feststdatum>
"2012-08-30T00:00:00+01:00"^^<http://www.w3.org/2001/XMLSchema#dateTime> .

<https://agfa.com/orbis/SALUS/resource/Diagnosen/726450001#this>
<http://www.agfa.com/w3c/orbis/orbis-schema/Diagnosen#diagkurz> "I21" .

<https://agfa.com/orbis/SALUS/resource/Diagnosen/726450001#this>
<http://www.agfa.com/w3c/orbis/orbis-schema/Diagnosen#diagbez> "Akuter
Myokardinfarkt" .

<https://agfa.com/orbis/SALUS/resource/Diagnosen/726450001#this>
<http://www.agfa.com/w3c/orbis/orbis-schema/Diagnosen#codesgbv> "I21.-" .

<https://agfa.com/orbis/SALUS/resource/Diagnosen/726450001#this>
<http://www.agfa.com/w3c/orbis/orbis-schema/Diagnosen#diagtypid>
<https://agfa.com/orbis/SALUS/resource/Diagnosetyp/29#this> .

<https://agfa.com/orbis/SALUS/resource/Diagnosetyp/29#this>
<http://www.agfa.com/w3c/orbis/orbis-schema/Diagnosetyp#hl7kurz>
"icd10gm2012" .

```

## 5.2.2 Medication

In ORBIS the medication information is stored in customized ORBIS forms. In practice at UKD the medication information for inpatients are stored on paper and not in ORBIS. For the other patient types the medication information is stored in 20 different medication forms for different clinics. Among those different medication forms, the 'Rezept neu' form and the 'Medikamentenliste\_PO\_ABDA9636' form are the mostly widely used. These two forms are accounting for more than 90% of the medication form instances. The 'Rezept neu' form is equivalent to prescription, while the 'Medikamentenliste\_PO\_ABDA9636' form is embedded in the admission or discharge letters. These two medication forms are formalized in the SALUS project.

### 5.2.2.1 Prescription Form – Rezept neu

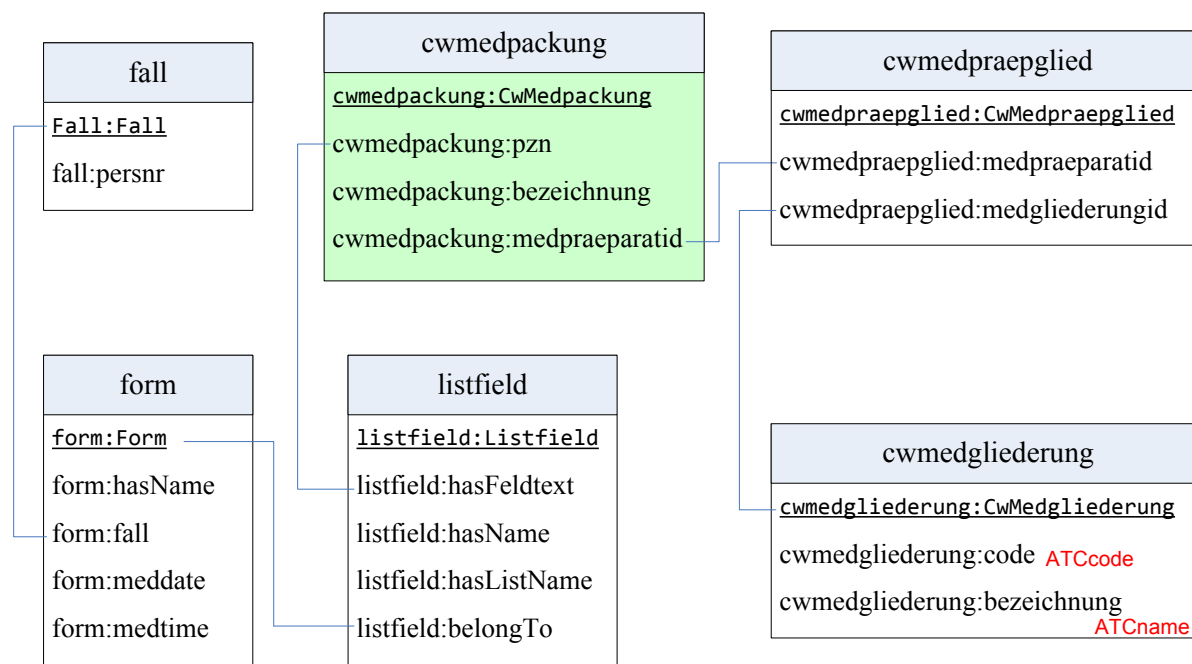


Figure 5 ORBIS Content Entity Model for Medication Form – Rezept neu

Figure 5 shows the ORBIS Content Entity Model for formalizing the 'Rezept neu' form. In the 'Rezept neu' form, there is a list named "ListeMedikamente", where a list of drugs can be prescribed. An entry of this list may have multiple fields, and the field "PZN" contains the PZN of a drug. While most of the ORBIS Content Model Ontologies formalized the Relational Database (RDB) tables in ORBIS, the form ontology and listfield ontology are created to formalize the Generic Data Model (GDM) of forms and list fields in ORBIS, so that they can also be queried by SPARQL query. The form:hasName property refers to the name of a form, in this case, it is assigned as "Rezept neu" to indicate the 'Rezept neu' form is the form to be queried. The form:fall property points to the 'Fall' class, which is further connected to the 'Patient' class. The form:meddate and form:medtime properties records the date and time a form is created. The listfield:hasName property keeps the name of a list field while the listfield:hasListName property records the name of the list. The listfield:belongsTo property indicates the form that a listfield belongs to. The listfield:hasFeldtext stores the contents of a list field, after specifying the form:hasName as "Rezept neu", the listfield:hasListname as "ListeMedikamente", and the listfield:hasName as "PZN", the data stored in listfield:hasFeldtext is exactly the PZN of a prescribed drug.

The cwmedpackung, cwmedpraepglied and cwmedgliederung ontologies are generated from the relational tables in ORBIS where drug information is stored, e.g. cwmedpackung is about drug package, and cwmedgliederung is about ATC coding. In the 'Rezept neu' form, the PZN is recorded in the form and is used to link to the aforementioned tables to retrieve the ATC code of the prescribed drug. The 'PZN' stands for 'Pharma Zentralnummer' (Pharmaceutical Central Number), each drug package has one PZN number.

The ORBIS Content Entity Model of the 'Rezept neu' form:

```
?cwmedpackung cwmedpackung:pzn ?hasPZN.
?cwmedpackung cwmedpackung:bezeichnung ?medPackname.
?cwmedpackung cwmedpackung:medpraeparatid ?medpraeparatid.

?cwmedpraepglied cwmedpraepglied:medpraeparatid ?medpraeparatid.
?cwmedpraepglied cwmedpraepglied:medgliederungid ?cwmedgliederung.

?cwmedgliederung cwmedgliederung:code ?ATCcode.
```

?cwmedgliederung cwmedgliederung:bezeichnung ?ATCname.

?pzn listfield:hasFeldtext ?hasPZN.

?pzn listfield:hasName "PZN".

?pzn listfield:hasListName "ListeMedikamente".

?pzn listfield:belongsTo ?form.

?form form:hasName "Rezept neu".

?form form:fall ?fall.

?form form:meddate ?formdate.

?form form:medtime ?formtime.

?fall fall:persnr ?patient.

A sample ORBIS Content Entity Model of the 'Rezept neu' form, returned by the ORBIS SPARQL Endpoint after executing the SPARQL Query mentioned in APPENDIX 4:

<https://agfa.com/orbis/SALUS/resource/Fall/43865001#this>

<http://www.agfa.com/w3c/orbis/orbis-schema/Fall#persnr>

<https://agfa.com/orbis/SALUS/resource/Patient/883001#this> .

<https://agfa.com/orbis/SALUS/resource/Form/39450101#this>

<http://www.agfa.com/w3c/orbis/orbis-schema/Form#fall>

<https://agfa.com/orbis/SALUS/resource/Fall/43865001#this> .

<https://agfa.com/orbis/SALUS/resource/Form/39450101#this>

<http://www.agfa.com/w3c/orbis/orbis-schema/Form#meddate> "2012-07-

23+01:00"^^<http://www.w3.org/2001/XMLSchema#date> .

<https://agfa.com/orbis/SALUS/resource/Form/39450101#this>

<http://www.agfa.com/w3c/orbis/orbis-schema/Form#medtime>

"12:12:12"^^<http://www.w3.org/2001/XMLSchema#time> .

<https://agfa.com/orbis/SALUS/resource/Listfield/39450101+69930+14578+1#this>

<http://www.agfa.com/w3c/orbis/orbis-schema/Listfield#hasListName>

"ListeMedikamente" .

<https://agfa.com/orbis/SALUS/resource/Listfield/39450101+69930+14578+1#this>

<http://www.agfa.com/w3c/orbis/orbis-schema/Listfield#hasName> "PZN" .

<https://agfa.com/orbis/SALUS/resource/Listfield/39450101+69930+14578+1#this>

<http://www.agfa.com/w3c/orbis/orbis-schema/Listfield#hasFeldtext>

"3552295" .

<https://agfa.com/orbis/SALUS/resource/Listfield/39450101+69930+14578+1#this>

<http://www.agfa.com/w3c/orbis/orbis-schema/Listfield#belongsTo>

<https://agfa.com/orbis/SALUS/resource/Form/39450101#this> .

<https://agfa.com/orbis/SALUS/resource/Form/39450101#this>

<http://www.agfa.com/w3c/orbis/orbis-schema/Form#hasName> "Rezept neu" .

<https://agfa.com/orbis/SALUS/resource/CwMedgliederung/11135801#this>

<http://www.agfa.com/w3c/orbis/orbis-schema/CwMedgliederung#code> "C08CA05"

.

<https://agfa.com/orbis/SALUS/resource/CwMedgliederung/11135801#this>

<http://www.agfa.com/w3c/orbis/orbis-schema/CwMedgliederung#bezeichnung>

"Nifedipin" .

```

<https://agfa.com/orbis/SALUS/resource/CwMedpraepglied/11276901#this>
<http://www.agfa.com/w3c/orbis/orbis-schema/CwMedpraepglied#medpraeparatid>
<https://agfa.com/orbis/SALUS/resource/CwMedpraeparat/11492601#this> .

<https://agfa.com/orbis/SALUS/resource/CwMedpraepglied/11276901#this>
<http://www.agfa.com/w3c/orbis/orbis-
schema/CwMedpraepglied#medgliederungid>
<https://agfa.com/orbis/SALUS/resource/CwMedgliederung/11135801#this> .

<https://agfa.com/orbis/SALUS/resource/CwMedpackung/11309601#this>
<http://www.agfa.com/w3c/orbis/orbis-schema/CwMedpackung#bezeichnung>
"Nifedipin-ratio Tropfen 100 ml N3" .

<https://agfa.com/orbis/SALUS/resource/CwMedpackung/11309601#this>
<http://www.agfa.com/w3c/orbis/orbis-schema/CwMedpackung#pzn> "3552295" .

<https://agfa.com/orbis/SALUS/resource/CwMedpackung/11309601#this>
<http://www.agfa.com/w3c/orbis/orbis-schema/CwMedpackung#medpraeparatid>
<https://agfa.com/orbis/SALUS/resource/CwMedpraeparat/11492601#this> .

```

### 5.2.2.2 Medikament Form – Medikamentenliste\_PO\_ABDA9636

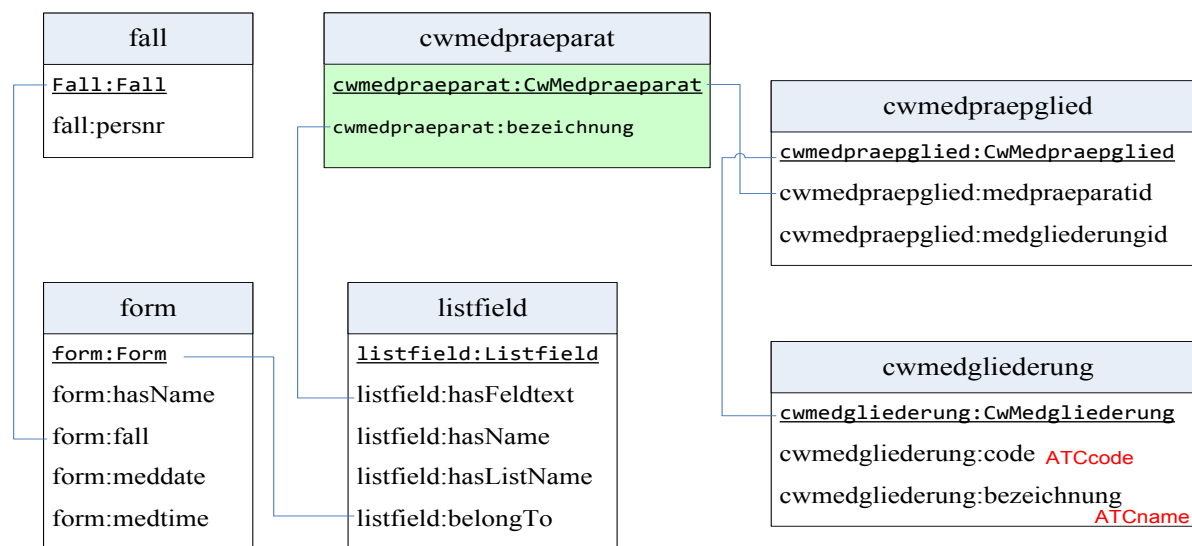


Figure 6 ORBIS Content Entity Model for Medication Form – Medikamentenliste\_PO\_ABDA9636

The ORBIS ontologies used in formalizing the 'Medikamentenliste\_PO\_ABDA9636' form is quite similar with what used in formalizing the 'Rezept neu' form. Except that in the 'Rezept neu' form, the PZN of the prescribed drug is recorded and is used to link to the cwmedpackung (drug package), while in the 'Medikamentenliste\_PO\_ABDA9636' form, only the drug name is recorded, which is then linked to the cwmedpraeparat (drug) table in order to retrieve the ATC code.

The Content Entity Model of the 'Medikamentenliste\_PO\_ABDA9636' form:

```

?cwmedpraepglied cwmedpraepglied:medpraeparatid ?cwmedpraeparat.
?cwmedpraepglied cwmedpraepglied:medgliederungid ?cwmedgliederung.

?cwmedpraeparat cwmedpraeparat:bezeichnung ?hasMedikament.

?cwmedgliederung cwmedgliederung:code ?ATCcode.
?cwmedgliederung cwmedgliederung:bezeichnung ?ATCname.

?medikament listfield:hasFeldtext ?hasMedikament.

```

```
?medikament listfield:hasName "T_Medikament".
?medikament listfield:hasListName "L_Medikamente".
?medikament listfield:belongsTo ?form.

?form form:hasName "Medikamentenliste_PO_ABDA9636".
?form form:fall ?fall.
?form form:meddate ?formdate.
?form form:medtime ?formtime.

?fall fall:persnr ?patient.
```

## 5.3 Source Content Terminologies

This section describes the terminologies used for the LISPA and UKD data sources.

### 5.3.1 LISPA Terminologies

The Lombardy Region uses ICD-9-CM for coding the conditions, allergies, procedures and interventions of the patients. For the coded brand name of the medication products a local terminology system called AIC is used. Since the coded active ingredients of the medication products are already available as codes from ATC terminology system, we do not need to do mappings for the local AIC terminology system. ICD-9-CM and ATC are already explained in Section 4. LISPA also provides the gender information through the `F` and `M` codes of the HL7 AdministrativeGender terminology system. LISPA is not able to provide laboratory results through its Data Warehouse, so no terminology system is used for them.

### 5.3.2 UKD Terminologies

The current diagnoses in UKD are coded with ICD-10-GM coding. UKD used the ICD10 SGBV2.0 coding system in the period 2001-2003 and the ICD10 SGBV1.3 coding system was used in the period 2000-2003. Since 2004, it uses ICD-10-GM-'YEAR' coding, where each year has its own ICD-10-GM version. An ICD-10-GM terminology library, represented in N3 format and covering different versions since 2004, is generated by AGFA and published by SRDC. This library will stay accessible even after the SALUS project finishes.

The medications in UKD are coded using ATC. The ATC code of the prescribed drug is normally available if the prescribed drug is entered in standard ways. A physician may also enter prescriptions as free text; in such cases, the prescribed drug will not be associated with any ATC code. In the 'Rezept neu' form, the PZN (Pharma Zentralnummer) of a drug is also stored.

The procedures in UKD are coded using the German standard OPS301 coding system. Conversions from OPS301 to other popular coding systems, e.g. LOINC, SNOMED, do not exist to our knowledge.

The lab test names and codes are created by UKD themselves. Lab tests are coded with the names/codes in this proprietary UKD list. Unfortunately there is no link between this list and standard coding systems, like LOINC.



## 6 TARGET CONTENT ENTITY MODELS

In addition to the Observational Medical Outcomes Partnership (OMOP) Common Data Model (CDM) that is explained next we have ICH E2B(R2) as a target content model as well, which is the agreed format for reporting adverse drug events (ADEs) as Individual Case Safety Reports (ICSRs) to regulatory bodies. However, we did not create a content entity model for ICH E2B(R2) since the ICSR Reporting Tool manages the ICSRs in native ICH E2B(R2) XML syntax, after semantically processing patient data represented in SALUS CIM for pre-population of the report. Therefore, ICH E2B(R2) is not explained in this section. Details about ICH E2B(R2) as a target content model are available in SALUS D4.1.1.

### 6.1 OMOP CDM Content Entity Model

In three of our pilot application scenarios, namely “Temporal pattern characterisation”, “Temporal association screening” and “Manual clinical review of relevant medical history”, our pilot end user partner UMC has identified the target data model as OMOP CDM. OMOP is a public-private partnership funded and managed through the Foundation for the National Institutes of Health, with the overall aim to improve the safety monitoring of medicines. OMOP is based on a model where data from various sources is extracted and transformed to a common structure and framework for further analysis. This is referred to as the OMOP Common Data Model. Further details about the OMOP CDM content models as they will be used in SALUS are provided in SALUS D4.1.1 - SALUS Content models for the Functional Interoperability Profiles for Post Market Safety Studies - R1.

Unlike HL7 CDA that has an XML Schema defining the structure, OMOP CDM is defined through human readable tables and SQL scripts. Since the model is not complicated, we have created the content entity model of OMOP CDM manually. It is available in N3 syntax at <http://www.salusproject.eu/ontology/omop-cdm-ontology.n3>. It is not a 100% direct correspondence of the original OMOP CDM, because we need some further information such as the code system OID for a concept code, before creating the final SQL INSERT statements to be run on an OMOP database.

A tiny OMOP CDM Content Entity Model instance is provided below:

```
@prefix omop: <http://www.salusproject.eu/ontology/omop-cdm#> .
```

```
[ a omop:Person ;
  omop:care_site_id "53254132423" ;
  omop:day_of_birth "24" ;
  omop:location
    [ a omop:Location ;
      omop:address_1 "Via Don Giovanni Minzoni" ;
      omop:address_2 "No 34" ;
      omop:city "Milan" ;
      omop:state "MI" ;
      omop:zip "56123"
    ] ;
  omop:month_of_birth "04" ;
  omop:year_of_birth "1967"
].
```

### 6.2 Target Terminologies

In the first prototype, the target terminology systems that we have are MedDRA, ATC, SNOMED CT and HL7 AdministrativeGender. These are all explained in Section 4.

## 7 SALUS SEMANTIC RESOURCE SET

Next we list a reference to all the ontologies and terminologies comprising the SALUS semantic resource set. For the terminology system ontologies, the namespaces used are provided. Due to licensing issues, access to these resources will be granted on case by case basis. Please send an email to [salus-technical@srdc.com.tr](mailto:salus-technical@srdc.com.tr) for accessing these resources.

Description	Location
SALUS Common Information Model Ontology	<a href="http://www.salusproject.eu/ontology/salus-cim-ontology.n3">http://www.salusproject.eu/ontology/salus-cim-ontology.n3</a>
OMOP CDM Content Entity Model Ontology	<a href="http://www.salusproject.eu/ontology/omop-cdm-ontology.n3">http://www.salusproject.eu/ontology/omop-cdm-ontology.n3</a>
CDA/CCD Content Entity Model Ontology	<a href="http://www.salusproject.eu/ontology/hl7-cda-ontology.n3">http://www.salusproject.eu/ontology/hl7-cda-ontology.n3</a>
ORBIS Content Entity Models Ontology	<a href="http://www.agfa.com/w3c/orbis/orbis-schema/">http://www.agfa.com/w3c/orbis/orbis-schema/</a> (Not distributed, due to Agfa copyright)
ATC Ontology	<a href="http://www.whooc.no/atc/">http://www.whooc.no/atc/</a> <a href="http://purl.bioontology.org/ontology/WHO/">http://purl.bioontology.org/ontology/WHO/</a> (SALUS fine-tuned models are not distributed, due to license issues)
MedDRA Ontology	<a href="http://purl.bioontology.org/ontology/MDR/">http://purl.bioontology.org/ontology/MDR/</a> (SALUS fine-tuned models are not distributed, due to license issues)
SNOMED CT Ontology	<a href="http://purl.bioontology.org/ontology/SNOMEDCT/">http://purl.bioontology.org/ontology/SNOMEDCT/</a> (SALUS fine-tuned models are not distributed, due to license issues)
ICD-10 Ontology	<a href="http://purl.bioontology.org/ontology/ICD10/">http://purl.bioontology.org/ontology/ICD10/</a> (SALUS fine-tuned models are not distributed, due to license issues)
ICD-10-GM Ontology	<a href="http://www.salusproject.eu/terminology/ICD10GM">http://www.salusproject.eu/terminology/ICD10GM</a> (SALUS fine-tuned models are not distributed, due to license issues)
ICD-9-CM Ontology	<a href="http://purl.bioontology.org/ontology/ICD9CM/">http://purl.bioontology.org/ontology/ICD9CM/</a> (SALUS fine-tuned models are not distributed, due to license issues)
HL7 AdministrativeGender Ontology	<a href="http://purl.bioontology.org/ontology/HL7/AdministrativeGender/">http://purl.bioontology.org/ontology/HL7/AdministrativeGender/</a> (SALUS fine-tuned models are not distributed, due to license issues)

## 8 CONCLUSION AND FUTURE WORK

The current version of the semantic resource set contains the SALUS Entity Models, which together define the SALUS Harmonized Model. These entities were identified in D4.2.1 on the basis of the different source and target content standards. In order to express these SALUS Entity Models we make use of ontologies. The Entity Models are formal models to represent a subject and its relationships. The main ontology, the SALUS CIM ontology, to express these entity models is automatically generated from the XSD schema collecting all the SALUS Common Data Elements (from D4.2.1) using the Ontmalizer tool (from task 4.4). The content models of the two data sources, i.e. LISPA and UKD, are formalized into two Source Content Entity Models. Similarly the content model of a target system, i.e. OMOP CDM, is formalized into a corresponding Target Content Entity Model. Note that there was no need yet to formalize the second target content model ICH E2B(R2) into a Target Content Entity Model as the ICSR tool uses the native content model. These three types of entity models allow us to establish a hub and spoke mediation process transforming a Source Content Entity Model via the SALUS Entity Models to a Target Content Entity Model. Having a hub and spoke mediation process allows us to limit the amount of mappings needed in task 4.4. A set of terminologies, represented using SKOS, is collected to specify the coded values for each of the entity models. For the SALUS Entity Models we defined the hub terminologies to be: ICD-10, SNOMED-CT, ATC, and HL7 AdministrativeGender. The source terminologies used in LISPA are ICD-9-CM and ATC. The source terminologies used in UKD are ICD-10-GM and ATC. The target terminologies are MedDRA, SNOMED-CT, ATC and HL7 AdministrativeGender.

In the next version of the semantic resource set we will refine the entity models and try to replace the concepts from our proprietary SALUS CIM ontology with concepts from non-proprietary ontologies. Depending on the pilot scenarios additional Source and Target Content Entity Models and Terminologies will be added. We plan to perform consistency checking on the semantic resource set using existing tools to detect any knowledge formalization and reconciliation errors, and also to repair any of the detected inconsistencies.

# APPENDIX 1. AN EXAMPLE MEDICAL SUMMARY IN HL7 CDA FORMAT USING PCC/CCD TEMPLATES

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ClinicalDocument xmlns="urn:hl7-org:v3" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <!--
*****
CDA Header
*****
-->
  <typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/>
  <templateId root="2.16.840.1.113883.10.20.1"/>
  <id root="db734647-fc99-424c-a864-7e3cda82e703"/>
  <code code="34133-9" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="Summarization of episode note"/>
  <title>SALUS Patient Summary Instance</title>
  <effectiveTime value="20130307130000+0200"/>
  <confidentialityCode code="N" codeSystem="2.16.840.1.113883.5.25"/>
  <languageCode code="en-US"/>
  <recordTarget>
    <patientRole>
      <id extension="547001" root="2.16.840.1.113883.2.9.4.3.2" assigningAuthorityName="MEF - Italian Citizen
Identity Authority"/>
      <addr use="HP">
        <city>Milan</city>
        <state>MI</state>
        <country>Italy</country>
      </addr>
      <patient>
        <name>
          <given>Patient1</given>
          <family>Cremona</family>
        </name>
        <administrativeGenderCode code="M" displayName="Male" codeSystem="2.16.840.1.113883.5.1"
codeSystemName="AdministrativeGender"/>
        <birthTime value="19450201"/>
      </patient>
      <providerOrganization>
        <id root="2.16.840.1.113883.2.9.4.3.2.4" extension="65432178901"/>
      </providerOrganization>
    </patientRole>
  </recordTarget>
  <author>
    <time value="20130307130000+0200"/>
    <assignedAuthor>
      <id root="2.16.840.1.113883.2.9.4.3.2.5" extension="76543218901"/>
      <assignedAuthoringDevice>
        <softwareName>SALUS LISPA Connector v0.1</softwareName>
      </assignedAuthoringDevice>
      <representedOrganization>
        <id root="2.16.840.1.113883.2.9.4.3.2.4" extension="65432178901"/>
      </representedOrganization>
    </assignedAuthor>
  </author>
  <custodian>
    <assignedCustodian>
      <representedCustodianOrganization>
        <id root="2.16.840.1.113883.2.9.4.3.2.4" extension="65432178901"/>
        <name>Lombardy Region</name>
      </representedCustodianOrganization>
    </assignedCustodian>
  </custodian>
  <component>

```

```

<structuredBody>
  <!--
  *****
  Active problems section
  *****
  -->
  <component>
    <section>
      <templateId root="2.16.840.1.113883.10.20.1.11"/>
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.6"/>
      <id root="087e4130-770a-42ee-879e-e60a1fc76110"/>
      <code code="11450-4" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="Problem list - Reported"/>
      <title>Problem List</title>
      <text>
        <table>
          <thead>
            <tr>
              <th>Condition</th>
              <th>Effective Dates</th>
            </tr>
          </thead>
          <tbody>
            <tr ID="actprob1">
              <td ID="actprob1_condition">Malignant essential hypertension</td>
              <td ID="actprob1_date">01.07.2009</td>
            </tr>
            <tr ID="actprob2">
              <td ID="actprob2_condition">New daily persistent headache</td>
              <td ID="actprob2_date">25.07.2009</td>
            </tr>
            <tr ID="actprob3">
              <td ID="actprob3_condition">Obesity, unspecified</td>
              <td ID="actprob3_date">01.06.2006</td>
            </tr>
          </tbody>
        </table>
      </text>
      <entry>
        <act classCode="ACT" moodCode="EVN">
          <templateId root="2.16.840.1.113883.10.20.1.27"/>
          <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.1"/>
          <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.2"/>
          <id root="37e7fef6-2c79-41fe-850e-b1994cdbf869"/>
          <code nullFlavor="NA"/>
          <text>
            <reference value="#actprob1"/>
          </text>
          <entryRelationship typeCode="SUBJ">
            <observation classCode="OBS" moodCode="EVN">
              <templateId root="2.16.840.1.113883.10.20.1.28"/>
              <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5"/>
              <id root="46190165-a977-4066-be72-1ba9a4f4025c"/>
              <code code="55607006" displayName="Problem" codeSystem="2.16.840.1.113883.6.96"
codeSystemName="SNOMED CT"/>
              <text>
                <reference value="#actprob1_condition"/>
              </text>
              <statusCode code="completed"/>
              <effectiveTime>
                <low value="20090701"/>
              </effectiveTime>
              <value xsi:type="CD" code="401.0" displayName="Malignant essential hypertension"
codeSystem="2.16.840.1.113883.6.2" codeSystemName="ICD-9-CM">
                <originalText>Malignant essential hypertension</originalText>
              </value>
            </observation>
          </entryRelationship>
        </act>
      </entry>
    </section>
  </component>

```

```

    </entryRelationship>
  </act>
</entry>
<entry>
  <act classCode="ACT" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.1.27"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.1"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.2"/>
    <id root="37e7fef6-2c79-41fe-850e-b1994cdbf869"/>
    <code nullFlavor="NA"/>
    <text>
      <reference value="#actprob2"/>
    </text>
    <entryRelationship typeCode="SUBJ">
      <observation classCode="OBS" moodCode="EVN">
        <templateId root="2.16.840.1.113883.10.20.1.28"/>
        <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5"/>
        <id root="46190165-a977-4066-be72-1ba9a4f4025c"/>
        <code code="55607006" displayName="Problem" codeSystem="2.16.840.1.113883.6.96"
codeSystemName="SNOMED CT"/>
        <text>
          <reference value="#actprob2_condition"/>
        </text>
        <statusCode code="completed"/>
        <effectiveTime>
          <low value="20090725"/>
        </effectiveTime>
        <value xsi:type="CD" code="339.42" displayName="New daily persistent headache"
codeSystem="2.16.840.1.113883.6.2" codeSystemName="ICD-9-CM">
          <originalText>New daily persistent headache</originalText>
        </value>
      </observation>
    </entryRelationship>
  </act>
</entry>
<entry>
  <act classCode="ACT" moodCode="EVN">
    <templateId root="2.16.840.1.113883.10.20.1.27"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.1"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.2"/>
    <id root="37e7fef6-2c79-41fe-850e-b1994cdbf869"/>
    <code nullFlavor="NA"/>
    <text>
      <reference value="#actprob3"/>
    </text>
    <entryRelationship typeCode="SUBJ">
      <observation classCode="OBS" moodCode="EVN">
        <templateId root="2.16.840.1.113883.10.20.1.28"/>
        <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5"/>
        <id root="46190165-a977-4066-be72-1ba9a4f4025c"/>
        <code code="55607006" displayName="Problem" codeSystem="2.16.840.1.113883.6.96"
codeSystemName="SNOMED CT"/>
        <text>
          <reference value="#actprob3_condition"/>
        </text>
        <statusCode code="completed"/>
        <effectiveTime>
          <low value="20060601"/>
        </effectiveTime>
        <value xsi:type="CD" code="278.00" displayName="Obesity, unspecified"
codeSystem="2.16.840.1.113883.6.2" codeSystemName="ICD-9-CM">
          <originalText>Obesity, unspecified</originalText>
        </value>
      </observation>
    </entryRelationship>
  </act>
</entry>

```

```

    </section>
  </component>
  <!--
*****
History of past illness section
*****
-->
  <component>
    <section>
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.8"/>
      <id root="93939ef9-05f7-4ad1-83e3-c23917d51d19"/>
      <code code="11348-0" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="History of past illness"/>
      <title>History of past illness</title>
      <text>
        <table>
          <thead>
            <tr>
              <th>Condition</th>
              <th>Effective Dates</th>
            </tr>
          </thead>
          <tbody>
            <tr ID="pastprob1">
              <td ID="pastprob1_condition">Acute myocardial infarction</td>
              <td ID="pastprob1_date">01.08.2009</td>
            </tr>
          </tbody>
        </table>
      </text>
      <entry>
        <act classCode="ACT" moodCode="EVN">
          <templateId root="2.16.840.1.113883.10.20.1.27"/>
          <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.1"/>
          <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5.2"/>
          <id root="a0fff30c-b94e-4eee-b5f5-bf5a79ebb929"/>
          <code nullFlavor="NA"/>
          <text>
            <reference value="#pastprob1"/>
          </text>
          <entryRelationship typeCode="SUBJ">
            <observation classCode="OBS" moodCode="EVN">
              <templateId root="2.16.840.1.113883.10.20.1.28"/>
              <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.5"/>
              <id root="2a29b507-3416-4a50-9e6a-9e05fa9f2af0"/>
              <code code="55607006" displayName="Problem" codeSystem="2.16.840.1.113883.6.96"
codeSystemName="SNOMED CT"/>
              <text>
                <reference value="#pastprob1_condition"/>
              </text>
              <statusCode code="completed"/>
              <effectiveTime>
                <low value="20090801"/>
                <high value="20090801"/>
              </effectiveTime>
              <value xsi:type="CD" code="410" displayName="Acute myocardial infarction"
codeSystem="2.16.840.1.113883.6.2" codeSystemName="ICD-9-CM">
                <originalText>Acute myocardial infarction</originalText>
              </value>
            </observation>
          </entryRelationship>
        </act>
      </entry>
    </section>
  </component>
  <!--
*****

```

## Medications section

\*\*\*\*\*

--&gt;

```

<component>
  <section>
    <templateId root="2.16.840.1.113883.10.20.1.8"/>
    <templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.19"/>
    <id root="3876f056-6ed4-4f77-9e6a-fdee4f88411d"/>
    <code code="10160-0" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="History of medication use"/>
    <title>History of medication use</title>
    <text>
      <table>
        <thead>
          <tr>
            <th>Medication</th>
            <th>Date</th>
          </tr>
        </thead>
        <tbody>
          <tr ID="med1">
            <td ID="med1_name">nifedipine</td>
            <td ID="med1_date">20.07.2009</td>
          </tr>
          <tr ID="med2">
            <td ID="med2_name">acetylsalicylic acid</td>
            <td ID="med2_date">02.08.2009</td>
          </tr>
          <tr ID="med3">
            <td ID="med3_name">losartan</td>
            <td ID="med3_date">20.07.2009</td>
          </tr>
        </tbody>
      </table>
    </text>
    <entry>
      <substanceAdministration classCode="SBADM" moodCode="INT">
        <templateId root="2.16.840.1.113883.10.20.1.24"/>
        <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.7"/>
        <id root="9e4c4be7-0d46-49cf-ba1e-170b5855bb5a"/>
        <text>
          <reference value="#med1"/>
        </text>
        <statusCode code="completed"/>
        <effectiveTime xsi:type="IVL_TS">
          <low value="20090720"/>
        </effectiveTime>
        <effectiveTime xsi:type="PIVL_TS" institutionSpecified="true" operator="A">
          <period value="8" unit="h"/>
        </effectiveTime>
        <routeCode code="PO" codeSystem="2.16.840.1.113883.5.112"
codeSystemName="RouteOfAdministration" displayName="Swallow, oral"/>
        <doseQuantity value="10" unit="mg"/>
        <consumable>
          <manufacturedProduct classCode="MANU">
            <templateId root="2.16.840.1.113883.10.20.1.53"/>
            <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.7.2"/>
            <manufacturedMaterial>
              <code code="316352" codeSystem="2.16.840.1.113883.6.88" codeSystemName="RxNorm"
displayName="Nifedipine 10 MG">
                <originalText>Nifedipine 10 MG</originalText>
                <translation code="C08CA05" displayName="nifedipine"
codeSystem="2.16.840.1.113883.6.73" codeSystemName="ATC"/>
              </code>
            </manufacturedMaterial>
          </manufacturedProduct>
        </consumable>
      </substanceAdministration>
    </entry>
  </section>
</component>

```



```

    </substanceAdministration>
  </entry>
  <entry>
    <substanceAdministration classCode="SBADM" moodCode="INT">
      <templateId root="2.16.840.1.113883.10.20.1.24"/>
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.7"/>
      <id root="9e4c4be7-0d46-49cf-ba1e-170b5855bb5a"/>
      <text>
        <reference value="#med2"/>
      </text>
      <statusCode code="completed"/>
      <effectiveTime xsi:type="IVL_TS">
        <low value="20090802"/>
      </effectiveTime>
      <effectiveTime xsi:type="PIVL_TS" institutionSpecified="true" operator="A">
        <period value="1" unit="d"/>
      </effectiveTime>
      <routeCode code="PO" codeSystem="2.16.840.1.113883.5.112"
codeSystemName="RouteOfAdministration" displayName="Swallow, oral"/>
      <doseQuantity value="250" unit="mg"/>
      <consumable>
        <manufacturedProduct classCode="MANU">
          <templateId root="2.16.840.1.113883.10.20.1.53"/>
          <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.7.2"/>
          <manufacturedMaterial>
            <code code="335953" codeSystem="2.16.840.1.113883.6.88" codeSystemName="RxNorm"
displayName="Aspirin 250 MG">
              <originalText>Aspirin 250 MG</originalText>
              <translation code="B01AC06" displayName="acetylsalicylic acid"
codeSystem="2.16.840.1.113883.6.73" codeSystemName="ATC"/>
            </code>
          </manufacturedMaterial>
        </manufacturedProduct>
      </consumable>
    </substanceAdministration>
  </entry>
  <entry>
    <substanceAdministration classCode="SBADM" moodCode="INT">
      <templateId root="2.16.840.1.113883.10.20.1.24"/>
      <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.7"/>
      <id root="9e4c4be7-0d46-49cf-ba1e-170b5855bb5a"/>
      <text>
        <reference value="#med3"/>
      </text>
      <statusCode code="completed"/>
      <effectiveTime xsi:type="IVL_TS">
        <low value="20090720"/>
      </effectiveTime>
      <effectiveTime xsi:type="PIVL_TS" institutionSpecified="true" operator="A">
        <period value="1" unit="d"/>
      </effectiveTime>
      <routeCode code="PO" codeSystem="2.16.840.1.113883.5.112"
codeSystemName="RouteOfAdministration" displayName="Swallow, oral"/>
      <doseQuantity value="50" unit="mg"/>
      <consumable>
        <manufacturedProduct classCode="MANU">
          <templateId root="2.16.840.1.113883.10.20.1.53"/>
          <templateId root="1.3.6.1.4.1.19376.1.5.3.1.4.7.2"/>
          <manufacturedMaterial>
            <code code="979492" codeSystem="2.16.840.1.113883.6.88" codeSystemName="RxNorm"
displayName="Losartan Potassium 50 MG Oral Tablet">
              <originalText>Losartan Potassium 50 MG Oral Tablet</originalText>
              <translation code="C09CA01" displayName="losartan" codeSystem="2.16.840.1.113883.6.73"
codeSystemName="ATC"/>
            </code>
          </manufacturedMaterial>
        </manufacturedProduct>
      </consumable>
    </substanceAdministration>
  </entry>

```

```
</consumable>  
</substanceAdministration>  
</entry>  
</section>  
</component>  
</structuredBody>  
</component>  
</ClinicalDocument>
```

## APPENDIX 2. AN EXAMPLE OF MEDICAL SUMMARY AS AN INSTANCE OF CDA/CCD CONTENT ENTITY MODEL

```

@prefix : <http://www.srdc.com.tr/ontmalizer/instance#> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix v3: <urn:hl7-org:v3#> .
@prefix owl: <http://www.w3.org/2002/07/owl#> .
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .
@prefix dtype: <http://www.srdc.com.tr/ontmalizer#> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .

:INS2007004_II_2
  a v3:II ;
  v3:assigningAuthorityName
    "MEF - Italian Citizen Identity Authority"^^v3:stDatatype ;
  v3:extension "547001"^^v3:stDatatype ;
  v3:root "2.16.840.1.113883.2.9.4.3.2"^^v3:uidDatatype .

:INS2007004_CS_7
  a v3:CS ;
  v3:code "completed"^^v3:csDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Entry_7>
  a <urn:hl7-org:v3#POCD_MT000040.Entry> ;
  v3:substanceAdministration
    <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.SubstanceAdministration_3> .

:INS2007004_ED_3
  a v3:ED ;
  v3:textContent "Malignant essential hypertension"^^xsd:string .

:INS2007004_TEL_11
  a v3:TEL ;
  v3:value "#med3"^^v3:urlDatatype .

:INS2007004_IVXB_TS_3
  a v3:IVXB_TS ;
  v3:value "20060601"^^v3:tsDatatype .

:INS2007004_CE_4
  a v3:CE ;
  v3:code "11450-4"^^v3:csDatatype ;
  v3:codeSystem "2.16.840.1.113883.6.1"^^v3:uidDatatype ;
  v3:codeSystemName "LOINC"^^v3:stDatatype ;
  v3:displayName "Problem list - Reported"^^v3:stDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_37>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "2.16.840.1.113883.10.20.1.53"^^v3:uidDatatype .

:INS2007004_TEL_4
  a v3:TEL ;
  v3:value "#actprob2_condition"^^v3:urlDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_9>
  a <urn:hl7-org:v3#StrucDoc.Td> ;
  v3:ID "med1_name"^^xsd:ID ;
  v3:textContent "nifedipine"^^xsd:string .

:INS2007004_CD_13
  a v3:CD ;
  v3:code "C08CA05"^^v3:csDatatype ;
  v3:codeSystem "2.16.840.1.113883.6.73"^^v3:uidDatatype ;

```

```

v3:codeSystemName "ATC"^^v3:stDatatype ;
v3:displayName "nifedipine"^^v3:stDatatype .

:INS2007004_CS_8
a v3:CS ;
v3:code "completed"^^v3:csDatatype .

:INS2007004_ED_4
a v3:ED ;
v3:reference :INS2007004_TEL_3 .

:INS2007004_CE_5
a v3:CE ;
v3:code "11348-0"^^v3:csDatatype ;
v3:codeSystem "2.16.840.1.113883.6.1"^^v3:uidDatatype ;
v3:codeSystemName "LOINC"^^v3:stDatatype ;
v3:displayName "History of past illness"^^v3:stDatatype .

:INS2007004_II_3
a v3:II ;
v3:extension "65432178901"^^v3:stDatatype ;
v3:root "2.16.840.1.113883.2.9.4.3.2.4"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.CustodianOrganization_1>
a <urn:hl7-org:v3#POCD_MT000040.CustodianOrganization> ;
v3:id :INS2007004_II_6 ;
v3:name :INS2007004_ON_1 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Entry_6>
a <urn:hl7-org:v3#POCD_MT000040.Entry> ;
v3:substanceAdministration
  <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.SubstanceAdministration_2> .

:INS2007004_IVXB_TS_2
a v3:IVXB_TS ;
v3:value "20090725"^^v3:tsDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_1>
a <urn:hl7-org:v3#StrucDoc.Tr> ;
v3:th <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Th_1> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Th_2> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_38>
a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.7.2"^^v3:uidDatatype .

:INS2007004_TEL_3
a v3:TEL ;
v3:value "#actprob2"^^v3:urlDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.SubstanceAdministration_1>
a <urn:hl7-org:v3#POCD_MT000040.SubstanceAdministration> ;
v3:classCode "SBADM"^^v3:ActClassDatatype ;
v3:consumable <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Consumable_1> ;
v3:doseQuantity :INS2007004_IVL_PQ_1 ;
v3:effectiveTime :INS2007004_IVL_TS_5 , :INS2007004_PIVL_TS_1 ;
v3:id :INS2007004_II_18 ;
v3:moodCode "INT"^^v3:x_DocumentSubstanceMoodDatatype ;
v3:routeCode :INS2007004_CE_7 ;
v3:statusCode :INS2007004_CS_6 ;
v3:templateId
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_27> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_28> ;
v3:text :INS2007004_ED_13 .

:INS2007004_CD_12
a v3:CD ;

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v3:code "410"^^v3:csDatatype ;
v3:codeSystem "2.16.840.1.113883.6.2"^^v3:uidDatatype ;
v3:codeSystemName "ICD-9-CM"^^v3:stDatatype ;
v3:displayName "Acute myocardial infarction"^^v3:stDatatype ;
v3:originalText :INS2007004_ED_12 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_en.given_1>
a <urn:hl7-org:v3#en.given> ;
v3:textContent "Patient1"^^xsd:string .

:INS2007004_TEL_6
a v3:TEL ;
v3:value "#actprob3_condition"^^v3:urlDatatype .

:INS2007004_ST_3
a v3:ST ;
v3:textContent "History of past illness"^^xsd:string .

:INS2007004_CE_6
a v3:CE ;
v3:code "10160-0"^^v3:csDatatype ;
v3:codeSystem "2.16.840.1.113883.6.1"^^v3:uidDatatype ;
v3:codeSystemName "LOINC"^^v3:stDatatype ;
v3:displayName "History of medication use"^^v3:stDatatype .

:INS2007004_II_10
a v3:II ;
v3:root "37e7fef6-2c79-41fe-850e-b1994cdbf869"^^v3:uidDatatype .

:INS2007004_ED_5
a v3:ED ;
v3:reference :INS2007004_TEL_4 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_20>
a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
v3:root "2.16.840.1.113883.10.20.1.27"^^v3:uidDatatype .

:INS2007004_IVXB_TS_5
a v3:IVXB_TS ;
v3:value "20090801"^^v3:tsDatatype .

:INS2007004_IVL_TS_7
a v3:IVL_TS ;
v3:low :INS2007004_IVXB_TS_8 .

:INS2007004_CD_11
a v3:CD ;
v3:code "55607006"^^v3:csDatatype ;
v3:codeSystem "2.16.840.1.113883.6.96"^^v3:uidDatatype ;
v3:codeSystemName "SNOMED CT"^^v3:stDatatype ;
v3:displayName "Problem"^^v3:stDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.SubstanceAdministration_2>
a <urn:hl7-org:v3#POCD_MT000040.SubstanceAdministration> ;
v3:classCode "SBADM"^^v3:ActClassDatatype ;
v3:consumable <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Consumable_2> ;
v3:doseQuantity :INS2007004_IVL_PQ_2 ;
v3:effectiveTime :INS2007004_PIVL_TS_2 , :INS2007004_IVL_TS_6 ;
v3:id :INS2007004_II_19 ;
v3:moodCode "INT"^^v3:x_DocumentSubstanceMoodDatatype ;
v3:routeCode :INS2007004_CE_9 ;
v3:statusCode :INS2007004_CS_7 ;
v3:templateId

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_32> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_31> ;
v3:text :INS2007004_ED_15 .

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<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_7>
  a <urn:hl7-org:v3#StrucDoc.Td> ;
  v3:ID "pastprob1_condition"^^xsd:ID ;
  v3:textContent "Acute myocardial infarction"^^xsd:string .

:INS2007004_ST_4
  a v3:ST ;
  v3:textContent "History of medication use"^^xsd:string .

:INS2007004_CE_7
  a v3:CE ;
  v3:code "PO"^^v3:csDatatype ;
  v3:codeSystem "2.16.840.1.113883.5.112"^^v3:uidDatatype ;
  v3:codeSystemName "RouteOfAdministration"^^v3:stDatatype ;
  v3:displayName "Swallow, oral"^^v3:stDatatype .

:INS2007004_II_11
  a v3:II ;
  v3:root "46190165-a977-4066-be72-1ba9a4f4025c"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.AuthoringDevice_1>
  a <urn:hl7-org:v3#POCD_MT000040.AuthoringDevice> ;
  v3:softwareName :INS2007004_SC_1 .

:INS2007004_II_1
  a v3:II ;
  v3:root "db734647-fc99-424c-a864-7e3cda82e703"^^v3:uidDatatype .

:INS2007004_ED_6
  a v3:ED ;
  v3:textContent "New daily persistent headache"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Section_3>
  a <urn:hl7-org:v3#POCD_MT000040.Section> ;
  v3:code :INS2007004_CE_6 ;
  v3:entry <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Entry_7> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Entry_6> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Entry_5> ;
  v3:id :INS2007004_II_17 ;
  v3:templateId
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_26> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_25> ;
  v3:text <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Text_3> ;
  v3:title :INS2007004_ST_4 .

:INS2007004_IVL_TS_6
  a v3:IVL_TS ;
  v3:low :INS2007004_IVXB_TS_7 .

:INS2007004_IVXB_TS_4
  a v3:IVXB_TS ;
  v3:value "20090801"^^v3:tsDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.SubstanceAdministration_3>
  a <urn:hl7-org:v3#POCD_MT000040.SubstanceAdministration> ;
  v3:classCode "SBADM"^^v3:ActClassDatatype ;
  v3:consumable <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Consumable_3> ;
  v3:doseQuantity :INS2007004_IVL_PQ_3 ;
  v3:effectiveTime :INS2007004_PIVL_TS_3 , :INS2007004_IVL_TS_7 ;
  v3:id :INS2007004_II_20 ;
  v3:moodCode "INT"^^v3:x_DocumentSubstanceMoodDatatype ;
  v3:routeCode :INS2007004_CE_11 ;
  v3:statusCode :INS2007004_CS_8 ;
  v3:templateId
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_36> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_35> ;
  v3:text :INS2007004_ED_17 .

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<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_8>
  a <urn:hl7-org:v3#StrucDoc.Td> ;
  v3:ID "pastprob1_date"^^xsd:ID ;
  v3:textContent "01.08.2009"^^xsd:string .

:INS2007004_CD_10
  a v3:CD ;
  v3:nullFlavor "NA"^^v3:NullFlavorDatatype .

:INS2007004_TEL_5
  a v3:TEL ;
  v3:value "#actprob3"^^v3:urlDatatype .

:INS2007004_CE_10
  a v3:CE ;
  v3:code "335953"^^v3:csDatatype ;
  v3:codeSystem "2.16.840.1.113883.6.88"^^v3:uidDatatype ;
  v3:codeSystemName "RxNorm"^^v3:stDatatype ;
  v3:displayName "Aspirin 250 MG"^^v3:stDatatype ;
  v3:originalText :INS2007004_ED_16 ;
  v3:translation :INS2007004_CD_14 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Component3_1>
  a <urn:hl7-org:v3#POCD_MT000040.Component3> ;
  v3:section <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Section_1> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Section_2>
  a <urn:hl7-org:v3#POCD_MT000040.Section> ;
  v3:code :INS2007004_CE_5 ;
  v3:entry <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Entry_4> ;
  v3:id :INS2007004_II_14 ;
  v3:templateId

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_19> ;
  v3:text <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Text_2> ;
  v3:title :INS2007004_ST_3 .

:INS2007004_IVXB_TS_7
  a v3:IVXB_TS ;
  v3:value "20090802"^^v3:tsDatatype .

:INS2007004_CS_3
  a v3:CS ;
  v3:code "completed"^^v3:csDatatype .

:INS2007004_ST_1
  a v3:ST ;
  v3:textContent "SALUS Patient Summary Instance"^^xsd:string .

:INS2007004_II_12
  a v3:II ;
  v3:root "37e7fef6-2c79-41fe-850e-b1994cdbf869"^^v3:uidDatatype .

:INS2007004_CE_8
  a v3:CE ;
  v3:code "316352"^^v3:csDatatype ;
  v3:codeSystem "2.16.840.1.113883.6.88"^^v3:uidDatatype ;
  v3:codeSystemName "RxNorm"^^v3:stDatatype ;
  v3:displayName "Nifedipine 10 MG"^^v3:stDatatype ;
  v3:originalText :INS2007004_ED_14 ;
  v3:translation :INS2007004_CD_13 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Th_5>
  a <urn:hl7-org:v3#StrucDoc.Th> ;
  v3:textContent "Medication"^^xsd:string .

:INS2007004_IVL_PQ_3

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a v3:IVL_PQ ;
v3:unit "mg"^^v3:csDatatype ;
v3:value "50"^^v3:realDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_33>
a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
v3:root "2.16.840.1.113883.10.20.1.53"^^v3:uidDatatype .

:INS2007004_II_6
a v3:II ;
v3:extension "65432178901"^^v3:stDatatype ;
v3:root "2.16.840.1.113883.2.9.4.3.2.4"^^v3:uidDatatype .

:INS2007004_TEL_8
a v3:TEL ;
v3:value "#pastprobl_condition"^^v3:urlDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_14>
a <urn:hl7-org:v3#StrucDoc.Td> ;
v3:ID "med3_date"^^xsd:ID ;
v3:textContent "20.07.2009"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Entry_3>
a <urn:hl7-org:v3#POCD_MT000040.Entry> ;
v3:act <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Act_3> .

:INS2007004_CD_8
a v3:CD ;
v3:code "55607006"^^v3:csDatatype ;
v3:codeSystem "2.16.840.1.113883.6.96"^^v3:uidDatatype ;
v3:codeSystemName "SNOMED CT"^^v3:stDatatype ;
v3:displayName "Problem"^^v3:stDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Thead_3>
a <urn:hl7-org:v3#StrucDoc.Thead> ;
v3:tr <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_7> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_17>
a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
v3:root "2.16.840.1.113883.10.20.1.28"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_4>
a <urn:hl7-org:v3#StrucDoc.Tr> ;
v3:ID "actprob3"^^xsd:ID ;
v3:td <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_6> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_5> .

:INS2007004_II_7
a v3:II ;
v3:root "087e4130-770a-42ee-879e-e60a1fc76110"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Component3_2>
a <urn:hl7-org:v3#POCD_MT000040.Component3> ;
v3:section <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Section_2> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Entry_2>
a <urn:hl7-org:v3#POCD_MT000040.Entry> ;
v3:act <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Act_2> .

:INS2007004_CE_11
a v3:CE ;
v3:code "PO"^^v3:csDatatype ;
v3:codeSystem "2.16.840.1.113883.5.112"^^v3:uidDatatype ;
v3:codeSystemName "RouteOfAdministration"^^v3:stDatatype ;
v3:displayName "Swallow, oral"^^v3:stDatatype .

:INS2007004_CS_4

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a v3:CS ;
v3:code "completed"^^v3:csDatatype .

:INS2007004_IVXB_TS_6
a v3:IVXB_TS ;
v3:value "20090720"^^v3:tsDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Section_1>
a <urn:hl7-org:v3#POCD_MT000040.Section> ;
v3:code :INS2007004_CE_4 ;
v3:entry <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Entry_1> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Entry_2> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Entry_3> ;
v3:id :INS2007004_II_7 ;
v3:templateId
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_2> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_3> ;
v3:text <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Text_1> ;
v3:title :INS2007004_ST_2 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Th_6>
a <urn:hl7-org:v3#StrucDoc.Th> ;
v3:textContent "Date"^^xsd:string .

:INS2007004_II_13
a v3:II ;
v3:root "46190165-a977-4066-be72-1ba9a4f4025c"^^v3:uidDatatype .

:INS2007004_ST_2
a v3:ST ;
v3:textContent "Problem List"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_34>
a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.7.2"^^v3:uidDatatype .

:INS2007004_CE_9
a v3:CE ;
v3:code "PO"^^v3:csDatatype ;
v3:codeSystem "2.16.840.1.113883.5.112"^^v3:uidDatatype ;
v3:codeSystemName "RouteOfAdministration"^^v3:stDatatype ;
v3:displayName "Swallow, oral"^^v3:stDatatype .

:INS2007004_IVL_PQ_2
a v3:IVL_PQ ;
v3:unit "mg"^^v3:csDatatype ;
v3:value "250"^^v3:realDatatype .

:INS2007004_TEL_7
a v3:TEL ;
v3:value "#pastprob1"^^v3:urlDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tbody_3>
a <urn:hl7-org:v3#StrucDoc.Tbody> ;
v3:tr <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_8> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_10> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_9> .

:INS2007004_CD_7
a v3:CD ;
v3:nullFlavor "NA"^^v3:NullFlavorDatatype .

:INS2007004_II_14
a v3:II ;
v3:root "93939ef9-05f7-4ad1-83e3-c23917d51d19"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Material_3>

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a <urn:hl7-org:v3#POCD_MT000040.Material> ;
v3:code :INS2007004_CE_12 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.AssignedCustodian_1>
a <urn:hl7-org:v3#POCD_MT000040.AssignedCustodian> ;
v3:representedCustodianOrganization
  <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.CustodianOrganization_1> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_5>
a <urn:hl7-org:v3#StrucDoc.Tr> ;
v3:th <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Th_3> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Th_4> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_18>
a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.5"^^v3:uidDatatype .

:INS2007004_CS_5
a v3:CS ;
v3:code "completed"^^v3:csDatatype .

:INS2007004_CE_12
a v3:CE ;
v3:code "979492"^^v3:csDatatype ;
v3:codeSystem "2.16.840.1.113883.6.88"^^v3:uidDatatype ;
v3:codeSystemName "RxNorm"^^v3:stDatatype ;
v3:displayName "Losartan Potassium 50 MG Oral Tablet"^^v3:stDatatype ;
v3:originalText :INS2007004_ED_18 ;
v3:translation :INS2007004_CD_15 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Component3_3>
a <urn:hl7-org:v3#POCD_MT000040.Component3> ;
v3:section <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Section_3> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Entry_5>
a <urn:hl7-org:v3#POCD_MT000040.Entry> ;
v3:substanceAdministration
  <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.SubstanceAdministration_1> .

:INS2007004_ClinicalDocument_1
a v3:ClinicalDocument ;
v3:author <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Author_1> ;
v3:code :INS2007004_CE_1 ;
v3:component <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Component2_1> ;
v3:confidentialityCode
  :INS2007004_CE_2 ;
v3:custodian <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Custodian_1> ;
v3:effectiveTime :INS2007004_TS_1 ;
v3:id :INS2007004_II_1 ;
v3:languageCode :INS2007004_CS_1 ;
v3:recordTarget <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.RecordTarget_1> ;
v3:templateId
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_1> ;
v3:title :INS2007004_ST_1 ;
v3:typeId <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.typeId_1> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Th_3>
a <urn:hl7-org:v3#StrucDoc.Th> ;
v3:textContent "Condition"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_35>
a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
v3:root "2.16.840.1.113883.10.20.1.24"^^v3:uidDatatype .

:INS2007004_II_4
a v3:II ;
v3:extension "76543218901"^^v3:stDatatype ;

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v3:root "2.16.840.1.113883.2.9.4.3.2.5"^^v3:uidDatatype .

:INS2007004_Anon_3_1
  a v3:Anon_3 ;
  v3:textContent "MI"^^xsd:string .

:INS2007004_ED_1
  a v3:ED ;
  v3:reference :INS2007004_TEL_1 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_12>
  a <urn:hl7-org:v3#StrucDoc.Td> ;
  v3:ID "med2_date"^^xsd:ID ;
  v3:textContent "02.08.2009"^^xsd:string .

:INS2007004_IVL_PQ_1
  a v3:IVL_PQ ;
  v3:unit "mg"^^v3:csDatatype ;
  v3:value "10"^^v3:realDatatype .

:INS2007004_II_15
  a v3:II ;
  v3:root "a0fff30c-b94e-4eee-b5f5-bf5a79ebb929"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_9>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "2.16.840.1.113883.10.20.1.27"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tbody_2>
  a <urn:hl7-org:v3#StrucDoc.Tbody> ;
  v3:tr <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_6> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_19>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "1.3.6.1.4.1.19376.1.5.3.1.3.8"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_2>
  a <urn:hl7-org:v3#StrucDoc.Tr> ;
  v3:ID "actprobl"^^xsd:ID ;
  v3:td <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_1> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_2> .

:INS2007004_ED_17
  a v3:ED ;
  v3:reference :INS2007004_TEL_11 .

:INS2007004_II_20
  a v3:II ;
  v3:root "9e4c4be7-0d46-49cf-ba1e-170b5855bb5a"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Thead_1>
  a <urn:hl7-org:v3#StrucDoc.Thead> ;
  v3:tr <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_1> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Patient_1>
  a <urn:hl7-org:v3#POCD_MT000040.Patient> ;
  v3:administrativeGenderCode
    :INS2007004_CE_3 ;
  v3:birthTime :INS2007004_TS_2 ;
  v3:name :INS2007004_PN_1 .

:INS2007004_CS_6
  a v3:CS ;
  v3:code "completed"^^v3:csDatatype .

:INS2007004_IVXB_TS_8
  a v3:IVXB_TS ;

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v3:value "20090720"^^v3:tsDatatype .

:INS2007004_Anon_2_1
  a v3:Anon_2 ;
  v3:textContent "Italy"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Entry_4>
  a <urn:hl7-org:v3#POCD_MT000040.Entry> ;
  v3:act <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Act_4> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StructDoc.Td_13>
  a <urn:hl7-org:v3#StructDoc.Td> ;
  v3:ID "med3_name"^^xsd:ID ;
  v3:textContent "losartan"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StructDoc.Tr_10>
  a <urn:hl7-org:v3#StructDoc.Tr> ;
  v3:ID "med3"^^xsd:ID ;
  v3:td <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StructDoc.Td_13> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StructDoc.Td_14> .

:INS2007004_TEL_9
  a v3:TEL ;
  v3:value "#med1"^^v3:urlDatatype .

:INS2007004_ED_2
  a v3:ED ;
  v3:reference :INS2007004_TEL_2 .

:INS2007004_II_5
  a v3:II ;
  v3:extension "65432178901"^^v3:stDatatype ;
  v3:root "2.16.840.1.113883.2.9.4.3.2.4"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Component2_1>
  a <urn:hl7-org:v3#POCD_MT000040.Component2> ;
  v3:structuredBody <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.StructuredBody_1> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StructDoc.Th_4>
  a <urn:hl7-org:v3#StructDoc.Th> ;
  v3:textContent "Effective Dates"^^xsd:string .

:INS2007004_TEL_10
  a v3:TEL ;
  v3:value "#med2"^^v3:urlDatatype .

:INS2007004_CD_15
  a v3:CD ;
  v3:code "C09CA01"^^v3:csDatatype ;
  v3:codeSystem "2.16.840.1.113883.6.73"^^v3:uidDatatype ;
  v3:codeSystemName "ATC"^^v3:stDatatype ;
  v3:displayName "losartan"^^v3:stDatatype .

:INS2007004_CD_14
  a v3:CD ;
  v3:code "B01AC06"^^v3:csDatatype ;
  v3:codeSystem "2.16.840.1.113883.6.73"^^v3:uidDatatype ;
  v3:codeSystemName "ATC"^^v3:stDatatype ;
  v3:displayName "acetylsalicylic acid"^^v3:stDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Custodian_1>
  a <urn:hl7-org:v3#POCD_MT000040.Custodian> ;
  v3:assignedCustodian
    <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.AssignedCustodian_1> .

:INS2007004_II_16
  a v3:II ;

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v3:root "2a29b507-3416-4a50-9e6a-9e05fa9f2af0"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tbody_1>
  a <urn:hl7-org:v3#StrucDoc.Tbody> ;
  v3:tr <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_2> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_3> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_4> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.AssignedAuthor_1>
  a <urn:hl7-org:v3#POCD_MT000040.AssignedAuthor> ;
  v3:assignedAuthoringDevice
    <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.AuthoringDevice_1> ;
  v3:id :INS2007004_II_4 ;
  v3:representedOrganization
    <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Organization_2> .

:INS2007004_CD_9
  a v3:CD ;
  v3:code "278.00"^^v3:csDatatype ;
  v3:codeSystem "2.16.840.1.113883.6.2"^^v3:uidDatatype ;
  v3:codeSystemName "ICD-9-CM"^^v3:stDatatype ;
  v3:displayName "Obesity, unspecified"^^v3:stDatatype ;
  v3:originalText :INS2007004_ED_9 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_8>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.5"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_36>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.7"^^v3:uidDatatype .

:INS2007004_ED_18
  a v3:ED ;
  v3:textContent "Losartan Potassium 50 MG Oral Tablet"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_3>
  a <urn:hl7-org:v3#StrucDoc.Tr> ;
  v3:ID "actprob2"^^xsd:ID ;
  v3:td <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_4> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_3> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Thead_2>
  a <urn:hl7-org:v3#StrucDoc.Thead> ;
  v3:tr <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_5> .

:INS2007004_ED_15
  a v3:ED ;
  v3:reference :INS2007004_TEL_10 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_en.family_1>
  a <urn:hl7-org:v3#en.family> ;
  v3:textContent "Cremona"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_2>
  a <urn:hl7-org:v3#StrucDoc.Td> ;
  v3:ID "actprob1_date"^^xsd:ID ;
  v3:textContent "01.07.2009"^^xsd:string .

:INS2007004_CD_4
  a v3:CD ;
  v3:nullFlavor "NA"^^v3:NullFlavorDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Consumable_2>
  a <urn:hl7-org:v3#POCD_MT000040.Consumable> ;
  v3:manufacturedProduct
    <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.ManufacturedProduct_2> .

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<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_26>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "1.3.6.1.4.1.19376.1.5.3.1.3.19"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.PatientRole_1>
  a <urn:hl7-org:v3#POCD_MT000040.PatientRole> ;
  v3:addr :INS2007004_AD_1 ;
  v3:id :INS2007004_II_2 ;
  v3:patient <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Patient_1> ;
  v3:providerOrganization
    <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Organization_1> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Act_3>
  a <urn:hl7-org:v3#POCD_MT000040.Act> ;
  v3:classCode "ACT"^^v3:x_ActClassDocumentEntryActDatatype ;
  v3:code :INS2007004_CD_7 ;
  v3:entryRelationship
    <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.EntryRelationship_3> ;
  v3:id :INS2007004_II_12 ;
  v3:moodCode "EVN"^^v3:x_ActMoodDocumentActMoodDatatype ;
  v3:templateId

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_16> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_15> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_14> ;
  v3:text :INS2007004_ED_7 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_7>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "2.16.840.1.113883.10.20.1.28"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Organization_1>
  a <urn:hl7-org:v3#POCD_MT000040.Organization> ;
  v3:id :INS2007004_II_3 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_8>
  a <urn:hl7-org:v3#StrucDoc.Tr> ;
  v3:ID "med1"^^xsd:ID ;
  v3:td <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_10> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_9> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_16>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.5.2"^^v3:uidDatatype .

:INS2007004_II_17
  a v3:II ;
  v3:root "3876f056-6ed4-4f77-9e6a-fdee4f88411d"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Observation_2>
  a <urn:hl7-org:v3#POCD_MT000040.Observation> ;
  v3:classCode "OBS"^^v3:ActClassObservationDatatype ;
  v3:code :INS2007004_CD_5 ;
  v3:effectiveTime :INS2007004_IVL_TS_2 ;
  v3:id :INS2007004_II_11 ;
  v3:moodCode "EVN"^^v3:x_ActMoodDocumentObservationDatatype ;
  v3:statusCode :INS2007004_CS_3 ;
  v3:templateId

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_13> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_12> ;
  v3:text :INS2007004_ED_5 ;
  v3:value :INS2007004_CD_6 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Table_2>
  a <urn:hl7-org:v3#StrucDoc.Table> ;
  v3:tbody <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tbody_2> ;
  v3:thead <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Thead_2> .

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<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Th_1>
  a <urn:hl7-org:v3#StrucDoc.Th> ;
  v3:textContent "Condition"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_11>
  a <urn:hl7-org:v3#StrucDoc.Td> ;
  v3:ID "med2_name"^^xsd:ID ;
  v3:textContent "acetylsalicylic acid"^^xsd:string .

:INS2007004_IVL_TS_1
  a v3:IVL_TS ;
  v3:low :INS2007004_IVXB_TS_1 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_1>
  a <urn:hl7-org:v3#StrucDoc.Td> ;
  v3:ID "actprob1_condition"^^xsd:ID ;
  v3:textContent "Malignant essential hypertension"^^xsd:string .

:INS2007004_ED_16
  a v3:ED ;
  v3:textContent "Aspirin 250 MG"^^xsd:string .

:INS2007004_CD_3
  a v3:CD ;
  v3:code "401.0"^^v3:csDatatype ;
  v3:codeSystem "2.16.840.1.113883.6.2"^^v3:uidDatatype ;
  v3:codeSystemName "ICD-9-CM"^^v3:stDatatype ;
  v3:displayName "Malignant essential hypertension"^^v3:stDatatype ;
  v3:originalText :INS2007004_ED_3 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_6>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.5.2"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Consumable_1>
  a <urn:hl7-org:v3#POCD_MT000040.Consumable> ;
  v3:manufacturedProduct
    <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.ManufacturedProduct_1> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_25>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "2.16.840.1.113883.10.20.1.8"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Organization_2>
  a <urn:hl7-org:v3#POCD_MT000040.Organization> ;
  v3:id :INS2007004_II_5 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_9>
  a <urn:hl7-org:v3#StrucDoc.Tr> ;
  v3:ID "med2"^^xsd:ID ;
  v3:td <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_11> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_12> .

:INS2007004_II_18
  a v3:II ;
  v3:root "9e4c4be7-0d46-49cf-ba1e-170b5855bb5a"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_15>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.5.1"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Act_4>
  a <urn:hl7-org:v3#POCD_MT000040.Act> ;
  v3:classCode "ACT"^^v3:x_ActClassDocumentEntryActDatatype ;
  v3:code :INS2007004_CD_10 ;
  v3:entryRelationship

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    <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.EntryRelationship_4> ;
    v3:id :INS2007004_II_15 ;
    v3:moodCode "EVN"^^v3:x_DocumentActMoodDatatype ;
    v3:templateId
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_22> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_21> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_20> ;
    v3:text :INS2007004_ED_10 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Observation_3>
  a <urn:hl7-org:v3#POCD_MT000040.Observation> ;
  v3:classCode "OBS"^^v3:ActClassObservationDatatype ;
  v3:code :INS2007004_CD_8 ;
  v3:effectiveTime :INS2007004_IVL_TS_3 ;
  v3:id :INS2007004_II_13 ;
  v3:moodCode "EVN"^^v3:x_ActMoodDocumentObservationDatatype ;
  v3:statusCode :INS2007004_CS_4 ;
  v3:templateId
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_17> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_18> ;
  v3:text :INS2007004_ED_8 ;
  v3:value :INS2007004_CD_9 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Entry_1>
  a <urn:hl7-org:v3#POCD_MT000040.Entry> ;
  v3:act <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Act_1> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_30>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.7.2"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_10>
  a <urn:hl7-org:v3#StrucDoc.Td> ;
  v3:ID "med1_date"^^xsd:ID ;
  v3:textContent "20.07.2009"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Th_2>
  a <urn:hl7-org:v3#StrucDoc.Th> ;
  v3:textContent "Effective Dates"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Table_1>
  a <urn:hl7-org:v3#StrucDoc.Table> ;
  v3:tbody <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tbody_1> ;
  v3:thead <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Thead_1> .

:INS2007004_TS_1
  a v3:TS ;
  v3:value "20130307130000+0200"^^v3:tsDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Material_1>
  a <urn:hl7-org:v3#POCD_MT000040.Material> ;
  v3:code :INS2007004_CE_8 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Act_1>
  a <urn:hl7-org:v3#POCD_MT000040.Act> ;
  v3:classCode "ACT"^^v3:x_ActClassDocumentEntryActDatatype ;
  v3:code :INS2007004_CD_1 ;
  v3:entryRelationship
    <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.EntryRelationship_1> ;
  v3:id :INS2007004_II_8 ;
  v3:moodCode "EVN"^^v3:x_DocumentActMoodDatatype ;
  v3:templateId
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_5> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_4> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_6> ;
  v3:text :INS2007004_ED_1 .

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<http://www.srdc.com.tr/ontmalizer/instance#INS2007004\_POCD\_MT000040.InfrastructureRoot.templateId\_5>  
a <urn:hl7-org:v3#POCD\_MT000040.InfrastructureRoot.templateId> ;  
v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.5.1"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004\_POCD\_MT000040.InfrastructureRoot.templateId\_28>  
a <urn:hl7-org:v3#POCD\_MT000040.InfrastructureRoot.templateId> ;  
v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.7"^^v3:uidDatatype .

:INS2007004\_ED\_13  
a v3:ED ;  
v3:reference :INS2007004\_TEL\_9 .

:INS2007004\_II\_19  
a v3:II ;  
v3:root "9e4c4be7-0d46-49cf-ba1e-170b5855bb5a"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004\_POCD\_MT000040.InfrastructureRoot.templateId\_14>  
a <urn:hl7-org:v3#POCD\_MT000040.InfrastructureRoot.templateId> ;  
v3:root "2.16.840.1.113883.10.20.1.27"^^v3:uidDatatype .

:INS2007004\_CD\_6  
a v3:CD ;  
v3:code "339.42"^^v3:csDatatype ;  
v3:codeSystem "2.16.840.1.113883.6.2"^^v3:uidDatatype ;  
v3:codeSystemName "ICD-9-CM"^^v3:stDatatype ;  
v3:displayName "New daily persistent headache"^^v3:stDatatype ;  
v3:originalText :INS2007004\_ED\_6 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004\_StrucDoc.Tr\_6>  
a <urn:hl7-org:v3#StrucDoc.Tr> ;  
v3:ID "pastprob1"^^xsd:ID ;  
v3:td <http://www.srdc.com.tr/ontmalizer/instance#INS2007004\_StrucDoc.Td\_8> ,  
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004\_StrucDoc.Td\_7> .

:INS2007004\_Anon\_5\_1  
a v3:Anon\_5 ;  
v3:textContent "Milan"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004\_POCD\_MT000040.InfrastructureRoot.templateId\_31>  
a <urn:hl7-org:v3#POCD\_MT000040.InfrastructureRoot.templateId> ;  
v3:root "2.16.840.1.113883.10.20.1.24"^^v3:uidDatatype .

:INS2007004\_ED\_12  
a v3:ED ;  
v3:textContent "Acute myocardial infarction"^^xsd:string .

:INS2007004\_CS\_2  
a v3:CS ;  
v3:code "completed"^^v3:csDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004\_StrucDoc.Text\_3>  
a <urn:hl7-org:v3#StrucDoc.Text> ;  
v3:table <http://www.srdc.com.tr/ontmalizer/instance#INS2007004\_StrucDoc.Table\_3> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004\_POCD\_MT000040.InfrastructureRoot.templateId\_27>  
a <urn:hl7-org:v3#POCD\_MT000040.InfrastructureRoot.templateId> ;  
v3:root "2.16.840.1.113883.10.20.1.24"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004\_POCD\_MT000040.Act\_2>  
a <urn:hl7-org:v3#POCD\_MT000040.Act> ;  
v3:classCode "ACT"^^v3:x\_ActClassDocumentEntryActDatatype ;  
v3:code :INS2007004\_CD\_4 ;  
v3:entryRelationship  
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004\_POCD\_MT000040.EntryRelationship\_2> ;  
v3:id :INS2007004\_II\_10 ;  
v3:moodCode "EVN"^^v3:x\_ActClassDocumentEntryActMoodDatatype ;

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    v3:templateId
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_9> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_10> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_11> ;
    v3:text :INS2007004_ED_4 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Material_2>
    a <urn:hl7-org:v3#POCD_MT000040.Material> ;
    v3:code :INS2007004_CE_10 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_4>
    a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
    v3:root "2.16.840.1.113883.10.20.1.27"^^v3:uidDatatype .

:INS2007004_CD_5
    a v3:CD ;
    v3:code "55607006"^^v3:csDatatype ;
    v3:codeSystem "2.16.840.1.113883.6.96"^^v3:uidDatatype ;
    v3:codeSystemName "SNOMED CT"^^v3:stDatatype ;
    v3:displayName "Problem"^^v3:stDatatype .

:INS2007004_SC_1
    a v3:SC ;
    v3:textContent "SALUS LISPA Connector v0.1"^^xsd:string .

:INS2007004_ED_14
    a v3:ED ;
    v3:textContent "Nifedipine 10 MG"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Observation_1>
    a <urn:hl7-org:v3#POCD_MT000040.Observation> ;
    v3:classCode "OBS"^^v3:ActClassObservationDatatype ;
    v3:code :INS2007004_CD_2 ;
    v3:effectiveTime :INS2007004_IVL_TS_1 ;
    v3:id :INS2007004_II_9 ;
    v3:moodCode "EVN"^^v3:x_ActMoodDocumentObservationDatatype ;
    v3:statusCode :INS2007004_CS_2 ;
    v3:templateId
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_8> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_7> ;
    v3:text :INS2007004_ED_2 ;
    v3:value :INS2007004_CD_3 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tr_7>
    a <urn:hl7-org:v3#StrucDoc.Tr> ;
    v3:th <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Th_6> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Th_5> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_32>
    a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
    v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.7"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_13>
    a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
    v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.5"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.StructuredBody_1>
    a <urn:hl7-org:v3#POCD_MT000040.StructuredBody> ;
    v3:component <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Component3_2> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Component3_1> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Component3_3> .

:INS2007004_CS_1
    a v3:CS ;
    v3:code "en-US"^^v3:csDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Text_2>

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a <urn:hl7-org:v3#StrucDoc.Text> ;
v3:table <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Table_2> .

:INS2007004_II_9
a v3:II ;
v3:root "46190165-a977-4066-be72-1ba9a4f4025c"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.EntryRelationship_4>
a <urn:hl7-org:v3#POCD_MT000040.EntryRelationship> ;
v3:observation <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Observation_4> ;
v3:typeCode "SUBJ"^^v3:x_ActRelationshipEntryRelationshipDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_6>
a <urn:hl7-org:v3#StrucDoc.Td> ;
v3:ID "actprob3_date"^^xsd:ID ;
v3:textContent "01.06.2006"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.ManufacturedProduct_3>
a <urn:hl7-org:v3#POCD_MT000040.ManufacturedProduct> ;
v3:classCode "MANU"^^v3:RoleClassManufacturedProductDatatype ;
v3:manufacturedMaterial
  <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Material_3> ;
v3:templateId
  <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_37> ,
  <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_38> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_3>
a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
v3:root "1.3.6.1.4.1.19376.1.5.3.1.3.6"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_22>
a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.5.2"^^v3:uidDatatype .

:INS2007004_IVL_TS_5
a v3:IVL_TS ;
v3:low :INS2007004_IVXB_TS_6 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Text_1>
a <urn:hl7-org:v3#StrucDoc.Text> ;
v3:table <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Table_1> .

:INS2007004_ED_10
a v3:ED ;
v3:reference :INS2007004_TEL_7 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_12>
a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
v3:root "2.16.840.1.113883.10.20.1.28"^^v3:uidDatatype .

:INS2007004_II_8
a v3:II ;
v3:root "37e7fef6-2c79-41fe-850e-b1994cdbf869"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_29>
a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
v3:root "2.16.840.1.113883.10.20.1.53"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_5>
a <urn:hl7-org:v3#StrucDoc.Td> ;
v3:ID "actprob3_condition"^^xsd:ID ;
v3:textContent "Obesity, unspecified"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.EntryRelationship_3>
a <urn:hl7-org:v3#POCD_MT000040.EntryRelationship> ;
v3:observation <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Observation_3> ;
v3:typeCode "SUBJ"^^v3:x_ActRelationshipEntryRelationshipDatatype .

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<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.ManufacturedProduct_2>
  a <urn:hl7-org:v3#POCD_MT000040.ManufacturedProduct> ;
  v3:classCode "MANU"^^v3:RoleClassManufacturedProductDatatype ;
  v3:manufacturedMaterial
    <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Material_2> ;
  v3:templateId
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_33> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_34> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_2>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "2.16.840.1.113883.10.20.1.11"^^v3:uidDatatype .

:INS2007004_IVL_TS_4
  a v3:IVL_TS ;
  v3:high :INS2007004_IVXB_TS_5 ;
  v3:low :INS2007004_IVXB_TS_4 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_21>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.5.1"^^v3:uidDatatype .

:INS2007004_AD_1
  a v3:AD ;
  v3:city :INS2007004_Annon_5_1 ;
  v3:country :INS2007004_Annon_2_1 ;
  v3:state :INS2007004_Annon_3_1 ;
  v3:use "HP"^^v3:set_PostalAddressUseDatatype .

:INS2007004_CE_1
  a v3:CE ;
  v3:code "34133-9"^^v3:csDatatype ;
  v3:codeSystem "2.16.840.1.113883.6.1"^^v3:uidDatatype ;
  v3:codeSystemName "LOINC"^^v3:stDatatype ;
  v3:displayName "Summarization of episode note"^^v3:stDatatype .

:INS2007004_ED_11
  a v3:ED ;
  v3:reference :INS2007004_TEL_8 .

:INS2007004_IVXB_TS_1
  a v3:IVXB_TS ;
  v3:value "20090701"^^v3:tsDatatype .

:INS2007004_PQ_1
  a v3:PQ ;
  v3:unit "h"^^v3:csDatatype ;
  v3:value "8"^^v3:realDatatype .

:INS2007004_ED_9
  a v3:ED ;
  v3:textContent "Obesity, unspecified"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_11>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.5.2"^^v3:uidDatatype .

:INS2007004_PIVL_TS_2
  a v3:PIVL_TS ;
  v3:institutionSpecified
    "true"^^v3:blDatatype ;
  v3:operator "A"^^v3:SetOperatorDatatype ;
  v3:period :INS2007004_PQ_2 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.ManufacturedProduct_1>
  a <urn:hl7-org:v3#POCD_MT000040.ManufacturedProduct> ;

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v3:classCode "MANU"^^v3:RoleClassManufacturedProductDatatype ;
v3:manufacturedMaterial
  <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Material_1> ;
v3:templateId
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_29> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_30> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Observation_4>
  a <urn:hl7-org:v3#POCD_MT000040.Observation> ;
  v3:classCode "OBS"^^v3:ActClassObservationDatatype ;
  v3:code :INS2007004_CD_11 ;
  v3:effectiveTime :INS2007004_IVL_TS_4 ;
  v3:id :INS2007004_II_16 ;
  v3:moodCode "EVN"^^v3:x_ActMoodDocumentObservationDatatype ;
  v3:statusCode :INS2007004_CS_5 ;
  v3:templateId
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_23> ,
<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_24> ;
  v3:text :INS2007004_ED_11 ;
  v3:value :INS2007004_CD_12 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_4>
  a <urn:hl7-org:v3#StrucDoc.Td> ;
  v3:ID "actprob2_date"^^xsd:ID ;
  v3:textContent "25.07.2009"^^xsd:string .

:INS2007004_PN_1
  a v3:PN ;
  v3:family <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_en.family_1> ;
  v3:given <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_en.given_1> .

:INS2007004_TEL_2
  a v3:TEL ;
  v3:value "#actprob1_condition"^^v3:urlDatatype .

:INS2007004_CD_2
  a v3:CD ;
  v3:code "55607006"^^v3:csDatatype ;
  v3:codeSystem "2.16.840.1.113883.6.96"^^v3:uidDatatype ;
  v3:codeSystemName "SNOMED CT"^^v3:stDatatype ;
  v3:displayName "Problem"^^v3:stDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_1>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "2.16.840.1.113883.10.20.1"^^v3:uidDatatype .

:INS2007004_IVL_TS_3
  a v3:IVL_TS ;
  v3:low :INS2007004_IVXB_TS_3 .

:INS2007004_CE_2
  a v3:CE ;
  v3:code "N"^^v3:csDatatype ;
  v3:codeSystem "2.16.840.1.113883.5.25"^^v3:uidDatatype .

:INS2007004_TS_2
  a v3:TS ;
  v3:value "19450201"^^v3:tsDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_24>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.5"^^v3:uidDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_10>
  a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
  v3:root "1.3.6.1.4.1.19376.1.5.3.1.4.5.1"^^v3:uidDatatype .

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:INS2007004_ED_8
  a  v3:ED ;
  v3:reference :INS2007004_TEL_6 .

:INS2007004_PQ_2
  a  v3:PQ ;
  v3:unit "d"^^v3:csDatatype ;
  v3:value "1"^^v3:realDatatype .

:INS2007004_PIVL_TS_1
  a  v3:PIVL_TS ;
  v3:institutionSpecified
    "true"^^v3:blDatatype ;
  v3:operator "A"^^v3:SetOperatorDatatype ;
  v3:period :INS2007004_PQ_1 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.EntryRelationship_2>
  a  <urn:hl7-org:v3#POCD_MT000040.EntryRelationship> ;
  v3:observation <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Observation_2> ;
  v3:typeCode "SUBJ"^^v3:x_ActRelationshipEntryRelationshipDatatype .

:INS2007004_TEL_1
  a  v3:TEL ;
  v3:value "#actprob1"^^v3:urlDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.typeId_1>
  a  <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.typeId> ;
  v3:extension "POCD_HD000040"^^v3:stDatatype ;
  v3:root "2.16.840.1.113883.1.3"^^v3:uidDatatype .

:INS2007004_PIVL_TS_3
  a  v3:PIVL_TS ;
  v3:institutionSpecified
    "true"^^v3:blDatatype ;
  v3:operator "A"^^v3:SetOperatorDatatype ;
  v3:period :INS2007004_PQ_3 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Author_1>
  a  <urn:hl7-org:v3#POCD_MT000040.Author> ;
  v3:assignedAuthor <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.AssignedAuthor_1> ;
  v3:time :INS2007004_TS_3 .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Consumable_3>
  a  <urn:hl7-org:v3#POCD_MT000040.Consumable> ;
  v3:manufacturedProduct
    <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.ManufacturedProduct_3> .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.RecordTarget_1>
  a  <urn:hl7-org:v3#POCD_MT000040.RecordTarget> ;
  v3:patientRole <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.PatientRole_1> .

:INS2007004_CD_1
  a  v3:CD ;
  v3:nullFlavor "NA"^^v3:NullFlavorDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Td_3>
  a  <urn:hl7-org:v3#StrucDoc.Td> ;
  v3:ID "actprob2_condition"^^xsd:ID ;
  v3:textContent "New daily persistent headache"^^xsd:string .

:INS2007004_IVL_TS_2
  a  v3:IVL_TS ;
  v3:low :INS2007004_IVXB_TS_2 .

:INS2007004_CE_3
  a  v3:CE ;
  v3:code "M"^^v3:csDatatype ;

```

```

v3:codeSystem "2.16.840.1.113883.5.1"^^v3:uidDatatype ;
v3:codeSystemName "AdministrativeGender"^^v3:stDatatype ;
v3:displayName "Male"^^v3:stDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.InfrastructureRoot.templateId_23>
a <urn:hl7-org:v3#POCD_MT000040.InfrastructureRoot.templateId> ;
v3:root "2.16.840.1.113883.10.20.1.28"^^v3:uidDatatype .

:INS2007004_TS_3
a v3:TS ;
v3:value "20130307130000+0200"^^v3:tsDatatype .

:INS2007004_ED_7
a v3:ED ;
v3:reference :INS2007004_TEL_5 .

:INS2007004_ON_1
a v3:ON ;
v3:textContent "Lombardy Region"^^xsd:string .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.EntryRelationship_1>
a <urn:hl7-org:v3#POCD_MT000040.EntryRelationship> ;
v3:observation <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_POCD_MT000040.Observation_1> ;
v3:typeCode "SUBJ"^^v3:x_ActRelationshipEntryRelationshipDatatype .

<http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Table_3>
a <urn:hl7-org:v3#StrucDoc.Table> ;
v3:tbody <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Tbody_3> ;
v3:thead <http://www.srdc.com.tr/ontmalizer/instance#INS2007004_StrucDoc.Thead_3> .

:INS2007004_PQ_3
a v3:PQ ;
v3:unit "d"^^v3:csDatatype ;
v3:value "1"^^v3:realDatatype .

```

## APPENDIX 3. ORBIS SPARQL QUERY FOR RETRIEVING DIAGNOSIS CONTENT ENTITY

\*\*\*\*\*  
 ORBIS SPARQL QUERY FOR RETRIEVING DIAGNOSIS CONTENT ENTITY  
 \*\*\*\*\*

PREFIX falldiagarten: <http://www.agfa.com/w3c/orbis/orbis-schema/FallDiagArten#>  
 PREFIX falldiagnosen: <http://www.agfa.com/w3c/orbis/orbis-schema/FallDiagnosen#>  
 PREFIX fall: <http://www.agfa.com/w3c/orbis/orbis-schema/Fall#>  
 PREFIX diagnosen: <http://www.agfa.com/w3c/orbis/orbis-schema/Diagnosen#>  
 PREFIX diagnosetyp: <http://www.agfa.com/w3c/orbis/orbis-schema/Diagnosetyp#>  
 PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

```

CONSTRUCT {
    ?fda falldiagarten:fallDiagnosenid ?fd.
    ?fda falldiagarten:feststdatum ?diagDate.
    ?fda falldiagarten:verdacht ?verdacht.
    ?fd a falldiagnosen:FallDiagnosen.
    ?fd falldiagnosen:fallid ?fall.
    ?fd falldiagnosen:diagnoseid ?primaryDiag.
    ?fd falldiagnosen:sekdiagnoseid ?secondDiagnosis.
    ?fd falldiagnosen:lokalisation ?lokalisation.
    ?fall fall:persnr ?patient.
    ?primaryDiag diagnosen:codesgbv ?diagCode.
    ?primaryDiag diagnosen:diagkurz ?diagkurz.
    ?primaryDiag diagnosen:diagbez ?diagName.
    ?primaryDiag diagnosen:diagtypid ?diagtyp.
    ?diagtyp diagnosetyp:hl7kurz ?diagnosisType.
} WHERE {
    ?fda falldiagarten:fallDiagnosenid ?fd.
    ?fda falldiagarten:feststdatum ?diagDate.
    OPTIONAL {
        ?fda falldiagarten:verdacht ?verdacht.
    }
    ?fd a falldiagnosen:FallDiagnosen.
    ?fd falldiagnosen:fallid ?fall.
    ?fd falldiagnosen:diagnoseid ?primaryDiag.
    OPTIONAL {
        ?fd falldiagnosen:lokalisation ?lokalisation.
    }
    ?fall fall:persnr ?patient.
    ?primaryDiag diagnosen:codesgbv ?diagCode.
    ?primaryDiag diagnosen:diagkurz ?diagkurz.
    ?primaryDiag diagnosen:diagbez ?diagName.
    ?primaryDiag diagnosen:diagtypid ?diagtyp.
    ?diagtyp diagnosetyp:hl7kurz ?diagnosisType.
}
  
```



## APPENDIX 4. ORBIS SPARQL QUERY FOR RETRIEVING MEDICATION CONTENT ENTITY

\*\*\*\*\*  
ORBIS SPARQL QUERY FOR RETRIEVING PRESCRIPTION FORM CONTENT ENTITY  
\*\*\*\*\*

PREFIX cwmedgliederung: <http://www.agfa.com/w3c/orbis/orbis-schema/CwMedgliederung#>  
 PREFIX cwmedpraepglied: <http://www.agfa.com/w3c/orbis/orbis-schema/CwMedpraepglied#>  
 PREFIX cwmedpraeparat: <http://www.agfa.com/w3c/orbis/orbis-schema/CwMedpraeparat#>  
 PREFIX cwmedpackung: <http://www.agfa.com/w3c/orbis/orbis-schema/CwMedpackung#>  
 PREFIX fall: <http://www.agfa.com/w3c/orbis/orbis-schema/Fall#>  
 PREFIX form: <http://www.agfa.com/w3c/orbis/orbis-schema/Form#>  
 PREFIX listfield: <http://www.agfa.com/w3c/orbis/orbis-schema/Listfield#>  
 PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

```
CONSTRUCT {
  ?cwmedpackung cwmedpackung:pzn ?hasPZN.
  ?cwmedpackung cwmedpackung:bezeichnung ?medPackname.
  ?cwmedpackung cwmedpackung:medpraeparatid ?medpraeparatid.
  ?cwmedpraepglied cwmedpraepglied:medpraeparatid ?medpraeparatid.
  ?cwmedpraepglied cwmedpraepglied:medgliederungid ?cwmedgliederung.
  ?cwmedgliederung cwmedgliederung:code ?ATCcode.
  ?cwmedgliederung cwmedgliederung:bezeichnung ?ATCname.
  ?pzn listfield:hasFeldtext ?hasPZN.
  ?pzn listfield:hasName "PZN".
  ?pzn listfield:hasListName "ListeMedikamente".
  ?pzn listfield:belongsTo ?form.
  ?form form:hasName ?formName.
  ?form form:fall ?fall.
  ?form form:meddate ?formdate.
  ?form form:medtime ?formtime.
  ?fall fall:persnr ?patient.
} WHERE {
  ?cwmedpackung cwmedpackung:pzn ?hasPZN.
  ?cwmedpackung cwmedpackung:bezeichnung ?medPackname.
  ?cwmedpackung cwmedpackung:medpraeparatid ?medpraeparatid.
  ?cwmedpraepglied cwmedpraepglied:medpraeparatid ?medpraeparatid.
  ?cwmedpraepglied cwmedpraepglied:medgliederungid ?cwmedgliederung.
  ?cwmedgliederung cwmedgliederung:code ?ATCcode.
  ?cwmedgliederung cwmedgliederung:bezeichnung ?ATCname.
  ?pzn listfield:hasFeldtext ?hasPZN.
  ?pzn listfield:hasName "PZN".
  ?pzn listfield:hasListName "ListeMedikamente".
  ?pzn listfield:belongsTo ?form.
  ?form form:hasName ?formName.
  ?form form:fall ?fall.
  ?form form:meddate ?formdate.
  ?form form:medtime ?formtime.
  ?fall fall:persnr ?patient.
  FILTER (?ATCcode = "C08CA05")
  FILTER (?formName = "Rezept neu")
}
```

\*\*\*\*\*  
ORBIS SPARQL QUERY FOR RETRIEVING MEDIKAMENT FORM CONTENT ENTITY  
\*\*\*\*\*

PREFIX cwmedgliederung: <http://www.agfa.com/w3c/orbis/orbis-schema/CwMedgliederung#>  
 PREFIX cwmedpraepglied: <http://www.agfa.com/w3c/orbis/orbis-schema/CwMedpraepglied#>  
 PREFIX cwmedpraeparat: <http://www.agfa.com/w3c/orbis/orbis-schema/CwMedpraeparat#>  
 PREFIX cwmedpackung: <http://www.agfa.com/w3c/orbis/orbis-schema/CwMedpackung#>  
 PREFIX fall: <http://www.agfa.com/w3c/orbis/orbis-schema/Fall#>  
 PREFIX form: <http://www.agfa.com/w3c/orbis/orbis-schema/Form#>  
 PREFIX listfield: <http://www.agfa.com/w3c/orbis/orbis-schema/Listfield#>

PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

```

CONSTRUCT {
    ?cwmedpraepglied cwmedpraepglied:medpraeparatid ?cwmedpraeparat.
    ?cwmedpraepglied cwmedpraepglied:medgliederungid ?cwmedgliederung.
    ?cwmedpraeparat cwmedpraeparat:bezeichnung ?hasMedikament.
    ?cwmedgliederung cwmedgliederung:code ?ATCcode.
    ?cwmedgliederung cwmedgliederung:bezeichnung ?ATCname.
    ?medikament listfield:hasFeldtext ?hasMedikament.
    ?medikament listfield:hasName "T_Medikament".
    ?medikament listfield:hasListName "L_Medikamente".
    ?medikament listfield:belongsTo ?form.
    ?form form:hasName ?formName.
    ?form form:fall ?fall.
    ?form form:meddate ?formdate.
    ?form form:medtime ?formtime.
    ?fall fall:persnr ?patient.
} WHERE {
    ?cwmedpraepglied cwmedpraepglied:medpraeparatid ?cwmedpraeparat.
    ?cwmedpraepglied cwmedpraepglied:medgliederungid ?cwmedgliederung.
    ?cwmedpraeparat cwmedpraeparat:bezeichnung ?hasMedikament.
    ?cwmedgliederung cwmedgliederung:code ?ATCcode.
    ?cwmedgliederung cwmedgliederung:bezeichnung ?ATCname.
    ?medikament listfield:hasFeldtext ?hasMedikament.
    ?medikament listfield:hasName "T_Medikament".
    ?medikament listfield:hasListName "L_Medikamente".
    ?medikament listfield:belongsTo ?form.
    ?form form:hasName ?formName.
    ?form form:fall ?fall.
    ?form form:meddate ?formdate.
    ?form form:medtime ?formtime.
    ?fall fall:persnr ?patient.
    FILTER (?ATCcode = "C08CA05")
    FILTER (?formName = "Medikamentenliste_PO_ABDA9636")
}

```