HL7 Deutschland e. V.

INTERNATIONAL PATIENT SUMMARY (IPS)

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International Patient Summary

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Vision

- *"In order to further the care for citizens across the globe, we agree to **collaborate on a single, common International Patient Summary (IPS)** specification that is readily usable by all clinicians for the (cross-border) unscheduled care of a patient."*

Scope

- *"The IPS specification shall focus on a **minimal and non-exhaustive** Patient Summary, which is specialty-agnostic and condition-independent, but still clinically relevant."*

HL7 Int. & CEN/TC 251 agreement (April, 2017)

International Patient Summary
A common intent…

CEN/TC 251
IPS Project

HL7 IPS Project
[aka INTERPAS]

Joint Initiative Council Standards Set
[Global]

…a single "project" … conducted by several organizations…
… with "informal" coordination…

European Guidelines Patient Summary
[EU]

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HL7 IPS

International Patient Summary

- Parents and Companions
  - epSOS 2008-2012 / EXPAND 2012-2014
    - Continued as eHealth Digital Service Infrastructure
  - Continuity of Care / Consolidated CDA 2.1
  - 2010 EU/US Memorandum of Understanding
    - ONC Standards and Interoperability Framework EU/US eHealth Cooperation Initiative
    - EU project Trillium Bridge, continued as Trillium II
  - 2016 Transatlantic eHealth/health IT Cooperation Roadmap

International Patient Summary

- Implementable
  - Promote (the evolution and convergence of) existing standards
  - Rely on solutions that are already implemented or ready for implementation
  - Consider new or additional solutions as they become available

International Patient Summary

- Global Use
  - Strive for global accessibility of standards for free
  - Strive for a core set of globally accessible and broadly usable terminologies
  - Include free text in addition to the structured codes as needed
  - Do not include local solutions in that are not available in other jurisdictions

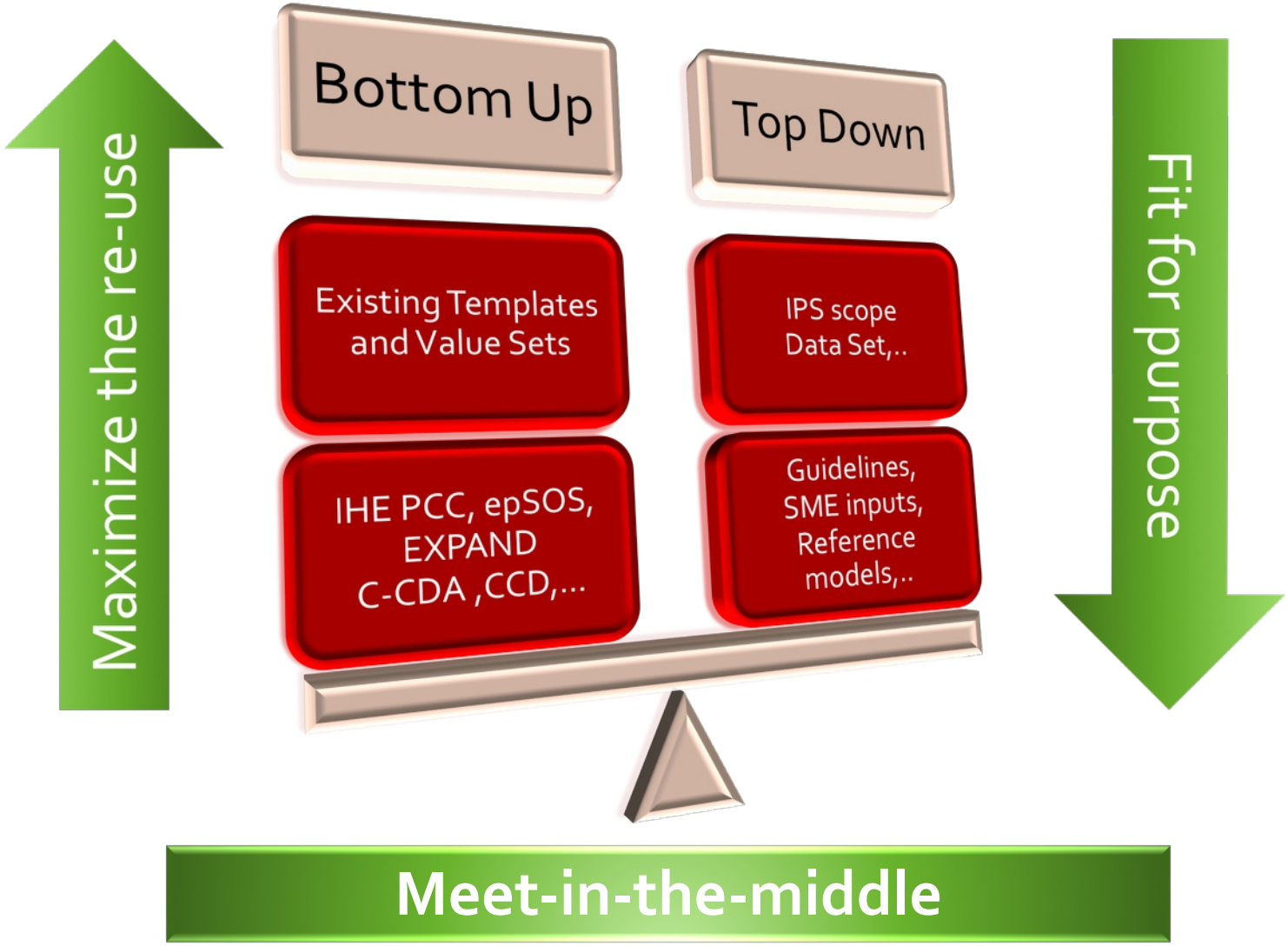
International Patient Summary

- Extensible and Open
  - Provide common content that can be extended for other use cases
  - Be open to emerging solutions for unresolved issues or improvements

International Patient Summary

- Sustainable
  - Ensured robust maintenance and update process for the IPS
  - Ensured clinical validity of the IPS, meeting requirements regarding
    - Clinical Workflow
    - Clinical Documentation
    - Information Quality

The HL7 IPS Approach



The HL7 IPS Project History…

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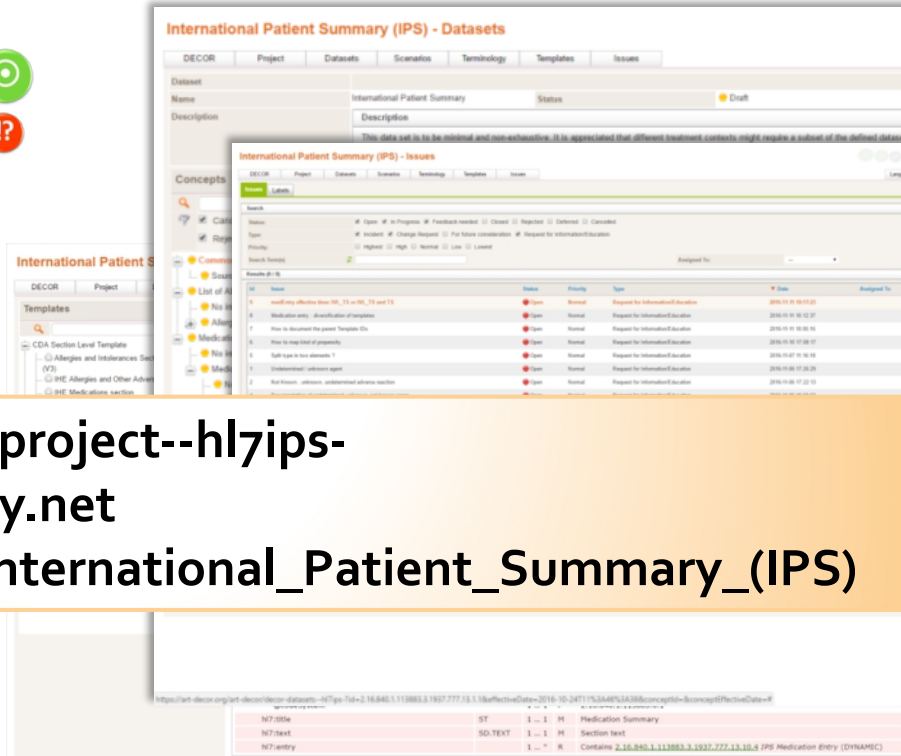
- October 2016: Approved by the HL7 Technical Steering Committee
  - **CDA R2 Implementation Guide for the IPS** and possible **FHIR Implementation Guide**.
  - Open template: extensible core specifications
  - Challenge: globally usable value sets for the IPS
- First Standard for Trial Use ballot on Sept 2017 (passed)
  - 443 Comments reconciled, 33 Negatives, 85% Quorum
- Second Standard for Trial Use ballot on January 2018 (passed)
  - 49 Comments reconciled, 10 Negatives, 87% Quorum
- January 2018 updated the IPS Project Scope
  - Scope: developing the IPS **FHIR Implementation Guide**
  - Started the development of a FHIR IG, to be balloted April/May 2018

HL7 IPS Project Overview

- Two products
  - HL7 CDA R2 Implementation Guide
  - HL7 FHIR Implementation Guide
- Tooling
  - ART-DECOR®
  - Forge, Simplifier
  - Wiki platform



art-decor.org/art-decor/decor-project--hl7ips-international-patient-summary.net
wiki.hl7.org/index.php?title=International_Patient_Summary_(IPS)

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The IPS Dataset and Sections

- Collection influenced by previous projects and experiences
- Trillium II Survey
- SAMPLER emergency scheme
- IPS Dataset, IPS Sections
  - Required
  - Recommended
  - Optional

Topic	Count
Medication (active)	9
Problems/Medical History	7
Allergies/Intolerances	7
Implanted devices	4
Risks	3
Diagnoses	3
Immunization	3
Procedures (major)	1

SAMPLER Emergency Scheme

- S – Signs/Symptoms
- A – Allergies
- M – Medications
- P – Past Illnesses
- L – Last Oral Intake
- E – Events before Present Illness / Injury
- R – Risks

Source: my colleague, Wikipedia, see also http://theemtspot.com/2012/03/08/understanding-the-sample-history/

The IPS Sections

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- Medication Summary
- Allergies and Intolerances
- Problem List
- Immunizations
- History of Procedures
- Medical Devices
- Diagnostic Results
- Past history of illnesses
- Pregnancy (status and history summary)
- Social History
- Functional Status (Autonomy / Invalidity)
- Plan of care
- Advance Directives
- Vital Signs

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HL7 IPS DETAILS

Medication Summary

- Description of the patient's medications relevant for the scope of the patient summary: Medication Statement
- Author, Informer
- Medication Entry with Consumable, Route of administration, Use period
- Never a dose quantity
- Subordinate Substance Administration for dose information
- Aligned with the Pharmacy Workgroup project “Medication on CDA”

Medication Summary

- Section IPS Medication Summary Section (2.16.840.1.113883.10.22.3.1)
  - Entry IPS Body Author (2.16.840.1.113883.10.22.4.14)
    - Entry IPS CDA Device (2.16.840.1.113883.10.22.9.2)
  - Entry CDA Informant (Body) (2.16.840.1.113883.10.12.319)
    - * CDA AssignedEntity (2.16.840.1.113883.10.12.153)
      - * CDA Person (2.16.840.1.113883.10.12.152)
      - * CDA Organization (2.16.840.1.113883.10.12.151)
    - Entry CDA RelatedEntity (2.16.840.1.113883.10.12.316)
      - * CDA Person (2.16.840.1.113883.10.12.152)
  - Entry IPS Medication Entry (2.16.840.1.113883.10.22.4.4)
    - Entry IPS ManufacturedProduct (2.16.840.1.113883.10.22.4.2)
      - Entry IPS Manufactured Material (2.16.840.1.113883.10.22.4.3)
    - Entry IPS Body Author (2.16.840.1.113883.10.22.4.14)
      - Entry IPS CDA Device (2.16.840.1.113883.10.22.9.2)
    - Entry IPS Subordinate SubstanceAdministration (2.16.840.1.113883.10.22.4.33)
  - Section IPS Translation Section (2.16.840.1.113883.10.22.3.15)

Medication Summary

Medication Summary

- SubstanceAdministration.code

▼ hl7:code	CD.IPS	1 ... 1	R	The <code> element is valorized with the Substance Administration ACT code "DRUG" unless it is used for asserting the known absence of medication treatments or no information about them.	IPSM ··· ntry
	CONF	The value of @code shall be drawn from value set 2.16.840.1.113883.11.22.14 *DRUGActCode* (DYNAMIC) or The value of @code shall be drawn from value set 2.16.840.1.113883.11.22.15 *Absent or Unknown Medication* (DYNAMIC)			

- A *valid* code
- ...or an *absent / unknown* code

Medication Summary

- SubstanceAdministration.effectiveTime
  - Always carries the use period **only**
  - Specific interval
  - Floating interval
  - Dosage always goes in sub-ordinate substance adminitrations

Example	Known Interval <effectiveTime> <low value="20130321"/> <high value="20140321"/> </effectiveTime>
Example	Information not available about the period <effectiveTime nullFlavor="NI"/>
Example	Unknown end date <effectiveTime> <low value="20130321"/> <high nullFlavor="UNK"/> </effectiveTime>
Example	Continuous terapy <effectiveTime> <low value="20130321"/> <high nullFlavor="NA"/> </effectiveTime>
Example	2 week period <effectiveTime> <width value="2" unit="wk"/> </effectiveTime>

Medication Summary

- Subordinate Substance Administration
  - Unless medications are unknown or known absent, **at least one subordinate** substance administration has to be present to convey information **about dosages** (dose, frequency of intakes,..)
  - Implementers want to see dose information always at the same place, and not somewhere dependent on the use case
    - Use cases: one dose, tapered dose, split dose

Medication Summary

Medication Summary

- Subordinate Substance Administration

Entry IPS Medication Entry (2.16.840.1.113883.10.22.4.4)

Entry IPS ManufacturedProduct (2.16.840.1.113883.10.22.4.2)

Entry IPS Manufactured Material (2.16.840.1.113883.10.22.4.3)

Entry IPS Body Author (2.16.840.1.113883.10.22.4.14)

Entry IPS CDA Device (2.16.840.1.113883.10.22.9.2)

Entry IPS Subordinate SubstanceAdministration (2.16.840.1.113883.10.22.4.33)

Elements to choose from:

- hl7:effectiveTim
- hl7:effectiveTim
- hl7:effectiveTim
- hl7:effectiveTim

<doseQuantity>

Example	Not pre-coordinated consumable <doseQuantity value="25" unit="mg"/>
Example	Pre-coordinated consumable - Dose Range <doseQuantity> <low value="1" unit="{tablet}"/> <high value="2" unit="{tablet}"/> </doseQuantity>
Example	Pre-coordinated consumable <doseQuantity value="2" unit="{puff}"/>

/or="NA"/>

Allergie/Intolerances

Allergies and Intolerances

- Allergy or Intolerance or I-don‘t-care
- Author and Informant
- Grouping Act (Concern Act)
  - Status code active or completed
- Allergy / Intolerance Observation
  - Allergy/Intolerance Type
  - Onset / Resolution date
  - Either code with “diagnosis” / absent, unknown
  - Or Agent participation with “substance”

Allergie/Intolerances

Allergies and Intolerances

- Reaction Manifestation
  - A Problem
  - Value Set Allergy Reaction

Id	2.16.840.1.113883.11.22.3	**Effective Date**	valid from
Status	Draft	**Version Label**	
Name	IPSAllergyReaction	**Display Name**	Allergy Re
Copyright	Licensing note: This artefact includes content from SNOMED Clinical Terms® (SNOMED CT® of the International Health Terminology Standards Development Organisation (IHTSDO). Im artefacts must have the appropriate SNOMED CT Affiliate license - for more information con http://www.snomed.org/snomed-ct/getsnomed-ct or info@snomed.org.		
Source Code System	2.16.840.1.113883.6.96 - *SNOMED Clinical Terms*		

Search by name

Level/ Type	Code	Display Name	Code System
0-L	1985008	Vomitus	SNOMED Clinical Terms
0-L	9826008	Bronchospasm	SNOMED Clinical Terms
0-L	9826008	Conjunctivitis	SNOMED Clinical Terms
0-L	23067006	Toxic epidermal necrolysis	SNOMED Clinical Terms

Allergie/Intolerances

Allergies and Intolerances

- Criticality
  - How threatening? High / Low / Unable to assess

```
<observation classCode="OBS" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.22.4.18"/>
  <code code="82606-5" codeSystem="2.16.840.1.113883.6.1"/>
  <statusCode code="completed"/>
  <value code="CRITH" displayName="high criticality" codeSystem="2.16.840.1.11388
</observation>
```

- Certainty / Verification Status
  - Unconfirmed / confirmed / refuted
- Status of Allergy / Intolerance
  - Active / inactive / +resolved

Allergie/Intolerances

Allergies and Intolerances

- Section IPS Allergies and Intolerances Section (2.16.840.1.113883.10.22.3.2)
  - Entry IPS Body Author (2.16.840.1.113883.10.22.4.14)
    - Entry IPS CDA Device (2.16.840.1.113883.10.22.9.2)
  - Entry CDA Informant (Body) (2.16.840.1.113883.10.12.319)
    - * CDA AssignedEntity (2.16.840.1.113883.10.12.153)
      - * CDA Person (2.16.840.1.113883.10.12.152)
      - * CDA Organization (2.16.840.1.113883.10.12.151)
    - Entry CDA RelatedEntity (2.16.840.1.113883.10.12.316)
      - * CDA Person (2.16.840.1.113883.10.12.152)
  - Entry IPS Allergy and Intolerance Concern (2.16.840.1.113883.10.22.4.5)
    - Entry IPS Allergy or Intolerance (2.16.840.1.113883.10.22.4.1)
      - Entry IPS Reaction Manifestation (2.16.840.1.113883.10.22.4.6)
        - Entry IPS Severity Observation (2.16.840.1.113883.10.22.4.25)
      - Entry IPS Criticality Observation (2.16.840.1.113883.10.22.4.18)
      - Entry IPS Allergy Certainty Observation (2.16.840.1.113883.10.22.10)
      - Entry IPS Allergy Status Observation (2.16.840.1.113883.10.22.4.21)
  - Section IPS Translation Section (2.16.840.1.113883.10.22.3.15)

Allergie/Intolerances

Allergies and Intolerances

- Minimum Set example

```
<observation classCode="OBS" moodCode="EVN">
  <templateId root="2.16.840.1.113883.10.22.4.1"/>
  <code code="X-AoI" displayName="Allergy or Intolerance"
codeSystem="2.16.840.1.113883.3.1937.777.13.5.999.1"/>
  <statusCode code="completed"/>
  <effectiveTime>
    <low nullFlavor="UNK"/>
  </effectiveTime>
  <participant typeCode="CSM">
    <participantRole classCode="MANU">
      <playingEntity classCode="MMAT">
        <code code="13577000" codeSystem="2.16.840.1.113883.6.96" displayName="Nut"/>
      </playingEntity>
    </participantRole>
  </participant>
</observation>
```

- No known allergies / No information

Problem List

- Problem List describes clinical problems or conditions currently being monitored for the patient
- Grouping Act (Concern Act)
- Problem Entry
  - Core Problem List of Disorders (Ranked list)

The CORE Problem List Subset of SNOMED CT® (Special Subset International Patient Summary)
The Clinical Observations Recordings and Encoding (CORE) Problem List Subset is a UMLS CORE Project with the purpose of defining a UMLS subset that is most useful for documenting and encoding clinical information at a summary level. The CORE Problem List Subset includes SNOMED CT concepts and codes that can be used for the problem list, discharge diagnoses, or reason of encounter.

  - …or absent / unknown

Problem List

- Severity
  - Mild / moderate / severe
- Certainty
  - unconfirmed
  - confirmed
- Problem Status
  - active
  - inactive

Level/ Type	Code	Display Name
0-S	*unconfirme*	
Collapse		
1-L	provision	
1-L	differenti	
0-L	confirmed	
0-L	refuted	
0-L	entered-in-error	

Level/ Type	Code	Display Name
0-S	*active*	*Active*
1-L	well-controlled	Well controlled
1-L	poorly-controlled	Poorly controlled
1-L	recurrence	Recurrence
1-L	relapse	Relapse
0-S	*inactive*	*Inactive*
1-L	remission	Remission
1-L	resolved	Resolved

Problem List

- Entry IPS Problem Concern Entry (2.16.840.1.113883.10.22.4.7)
  - Entry IPS Problem Entry (2.16.840.1.113883.10.22.4.8)
    - Entry IPS Severity Observation (2.16.840.1.113883.10.22.4.25)
    - Entry IPS Certainty Observation (2.16.840.1.113883.10.22.4.19)
    - Entry IPS Problem Status Observation (2.16.840.1.113883.10.22.4.20)

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HL7 IPS GENERAL ASPECTS

Wiki page

- With implementation guide and further information
- http://international-patient-summary.net

Terminology aspects

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- Single Code Binding

hl7:code		1…1	M	
@code	CONF	1…1	F	11450-4
@codeSystem		1…1	F	2.16.840.1.113883.6.1 (LOINC)
@displayName		1…1	F	Problem List

```
<code code="11450-4" codeSystem="2.16.840.1.113883.6.1"/>

<!-- or -->

<code code="11450-4" codeSystem="2.16.840.1.113883.6.1"
  displayName="Problem List" codeSystemName="LOINC"/>
```

Terminology aspects

HL7 Deutschland

- Translation use

```
<code code="206525008" codeSystem="2.16.840.1.113883.6.96"
  displayName="neonatal necrotizing enterocolitis" codeSystemName="SNOMED CT">
  <translation code="NEC-1" codeSystem="2.16.840.1.113883.19"
    displayName="necrotizing enterocolitis"/>
</code>
```

- Value Set
  - Extensional Definitions
  - Intensional Definitions and Value Set Expansions

Code	Intentional Definition
⊕ Include	*descendants of code 71181003 Vaccine (product)*

Terminology aspects

HL7 Deutschland

- Absent / Unknown
  - Explicit codes at prominent structural positions
- Uncoded information

```
<code codeSystem="2.16.840.1.113883.6.96" nullFlavor="OTH">
  <originalText>
    <reference value="#ref1"/>
  </originalText>
</code>
```

- Vocabulary Binding
  - Required (CNE), Extensible (CWE)
  - Preferred, Example

Terminology aspects

HL7 Deutschland

- Mappings

```
<value xsi:type="CD" code="422479008" codeSystem="2.16.840.1.113883.6.96"
  codeSystemName="SNOMED CT"
  displayName="FEMALE BREAST INFILTRATING DUCTAL CARCINOMA, STAGE 2">
  [
    <originalText>
       <reference value="#problem4name"/>
    </originalText>
  ]
  <translation code="code-example" codeSystem="1.999.999"
    codeSystemName="this is only an example"
    displayName="FEMALE BREAST INFILTRATING DUCTAL CARCINOMA, STAGE 2">
    <translation code="174.9" codeSystem="2.16.840.1.113883.6.103"
      codeSystemName="ICD-9CM"
      displayName="Malignant neoplasm of breast (female), unspecified"/>
    <translation code="C50.919" codeSystem="2.16.840.1.113883.6.90"
      codeSystemName="ICD-10-CM"
      displayName="Malignant neoplasm of unspecified site of unspecified female breast"/>
 </translation>
</value>
```

Terminology aspects

HL7 Deutschland

- Designations

```
<code code="60591-5" codeSystem="2.16.840.1.113883.6.1"
  codeSystemName="LOINC" displayName="Patient Summary">
  <ips:designation language="it-IT">Profilo Sanitario Sintetico</ips:designation>
  <ips:designation language="fr-FR">Patient Summary</ips:designation>
  <ips:designation language="en">Patient Summary</ips:designation>
</code>
```

```
<value xsi:type="CD" code="42338000" codeSystem="2.16.840.1.113883.6.96"
  displayName="Salmonella-gastroenterit">
  <ips:designation language="da-DK">Salmonella-gastroenterit</ips:designation>
  <ips:designation language="en">Salmonella gastroenteritis (disorder)</ips:designation>
  [
    <originalText>
      <reference value="#ref1"/>
    </originalText>
  ]
  <translation code="003.0" codeSystem="2.16.840.1.113883.6.103"
    displayName="Gastroenterite da Salmonella"/>
</value>
```

Translation Section

- Subsequent section under all “IPS Sections”
  - Allows to provide language translations

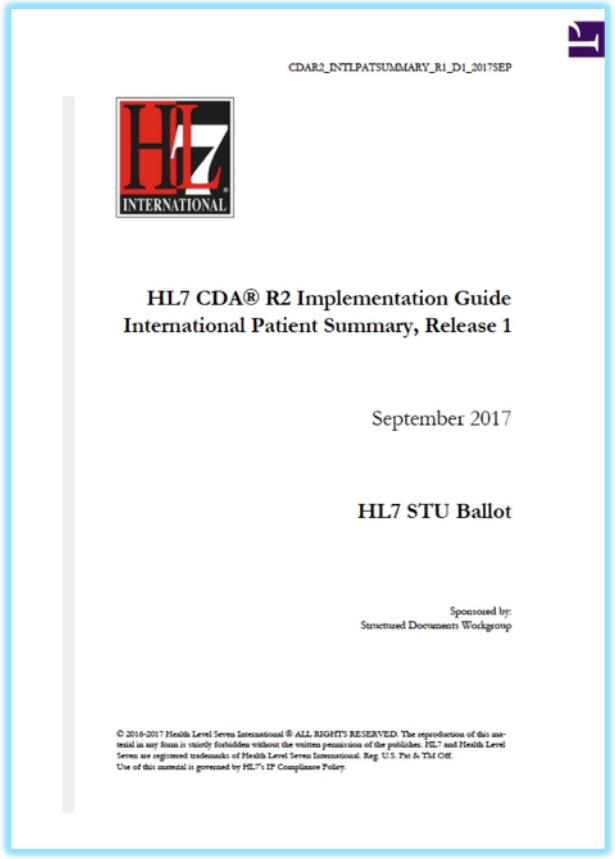
```
<section>
  <templateId root="2.16.840.1.113883.3.1937.777.13.10.5"/>
   <id root="..." extension="..."/>
   <code code="48765-2" codeSystem="2.16.840.1.113883.6.1"
      displayName="Allergies and adverse reactions"/>
   <title>Allergies and Intolerances</title>
   <text>No known Allergies</text>
   <!-- omissions -->
   <component>
      <section>
        <!--  subordinate section carrying a translation of the parent section -->
        <title>Allergie ed Intolleranze</title>
        <text>Nessuna Allergia Nota</text>
        <languageCode code="it-IT"/>
      </section>
    </component>
</section>
```

Provenance

- Optional author and informant elements are used when necessary to convey the provenance and authoring of the section content in case it is different from what is announced in the CDA header
- So far a simplistic approach to provenance

IPS CDA Implementation Guide

- Maintained in a Wiki, generated from the Wiki

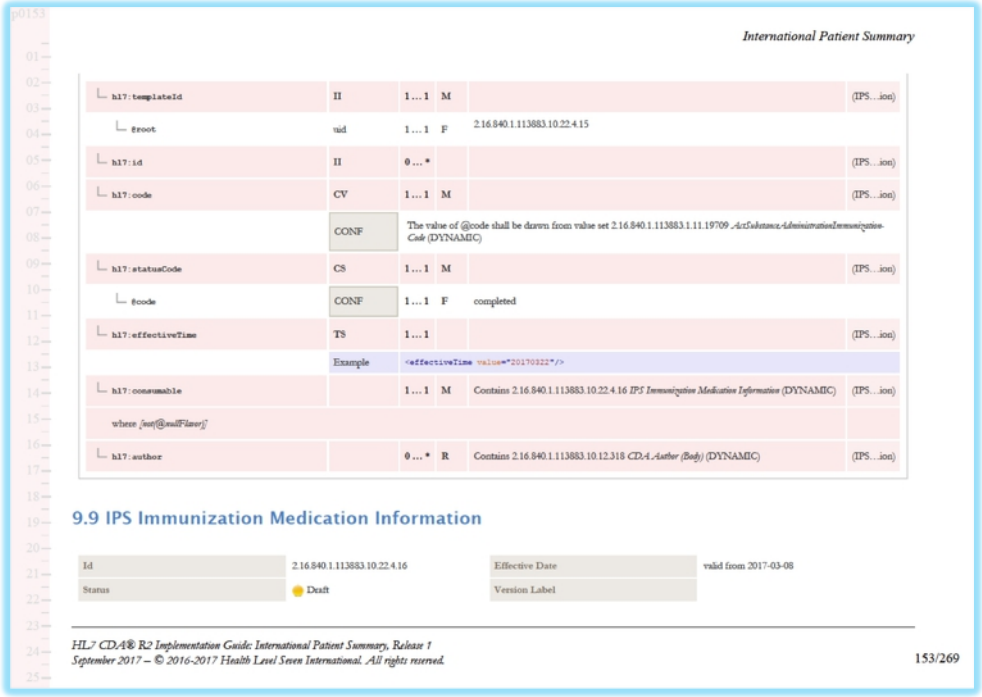

CDAR2_INTLPATSUMMARY_R1_D1_2017SEP

HL7 CDA® R2 Implementation Guide
International Patient Summary, Release 1

September 2017

HL7 STU Ballot

Sponsored by:
Structured Documents Workgroup



hl7:templateId	II	1...1	M		(IPS...ion)
@root	uid	1...1	F	2.16.840.1.113883.10.22.4.15	
hl7:id	II	0...*			(IPS...ion)
hl7:code	CV	1...1	M		(IPS...ion)
	CONF	The value of @code shall be drawn from value set 2.16.840.1.113883.1.11.19709 *ActSubstanceAdministrationImmunization-Code* (DYNAMIC)			
hl7:statusCode	CS	1...1	M		(IPS...ion)
@code	CONF	1...1	F	completed	
hl7:effectiveTime	TS	1...1			(IPS...ion)
	Example	<effectiveTime value="20170322"/>			
hl7:consumable		1...1	M	Contains 2.16.840.1.113883.10.22.4.16 *IPS Immunization Medication Information* (DYNAMIC)	(IPS...ion)
where *[not(@nullFlavor)]*					
hl7:author		0...*	R	Contains 2.16.840.1.113883.10.12.318 *CDA Author (Body)* (DYNAMIC)	(IPS...ion)

9.9 IPS Immunization Medication Information

Id	2.16.840.1.113883.10.22.4.16	Effective Date	valid from 2017-03-08
Status	Draft	Version Label	

IPS CDA Example (rendered)

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Patient Summary as of July 20, 2017 14:30

Patient	Martha DELAROSA	*Birthdate:* May 1, 1972 (45yr)	*Gender:* Female	*Patient-ID:* 574687583 (NL National PID)
Author: **Beetje VAN HULP** , *Authored on:* **July 20, 2017, 21:43:00 +0100**				

Table of Contents ∇

Active Problems

Hot flushes

Actieve probleme

opvliegers

Medication

Medication	Strength	Form	Dosage	Comment
Anastrozole	1 mg	tablet	once daily	treatment for breast cancer
Black Cohosh Extract		pil		herbal supplement

Medicatie

medicatie	sterkte	toedieningsvorm	dosering	commentaar
ANASTROZOL	1MG	TABLET	once daily	treatment for breast cancer
Zwarte Cohosh Extract		pil		kruiden

IPS FHIR Implementation Guide

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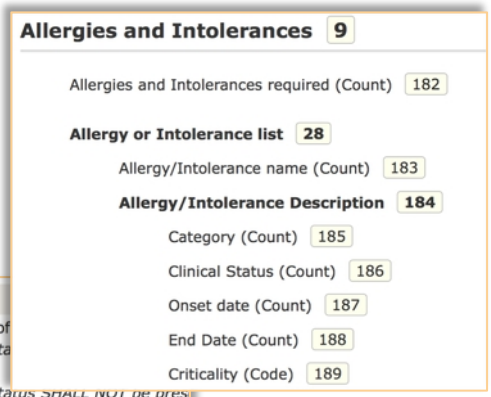
- Same conceptual content in both the CDA R2 and FHIR specifications
  - Dataset = semantic bridge CDA / FHIR



  - Out of scope: provide or require capability for automatic transformation of instances from CDA to FHIR and vice versa
- FHIR Implementation Guide based on FHIR STU3
- Ballot April/May 2018

IPS FHIR Implementation Guide

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1. FHIR IPS is a document (i.e. a composition)

2. FHIR IPS is a library

Intended Use

As a document

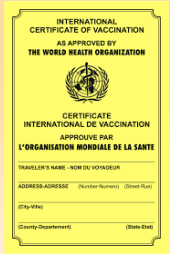
Future extensions and use

As shared data blocks

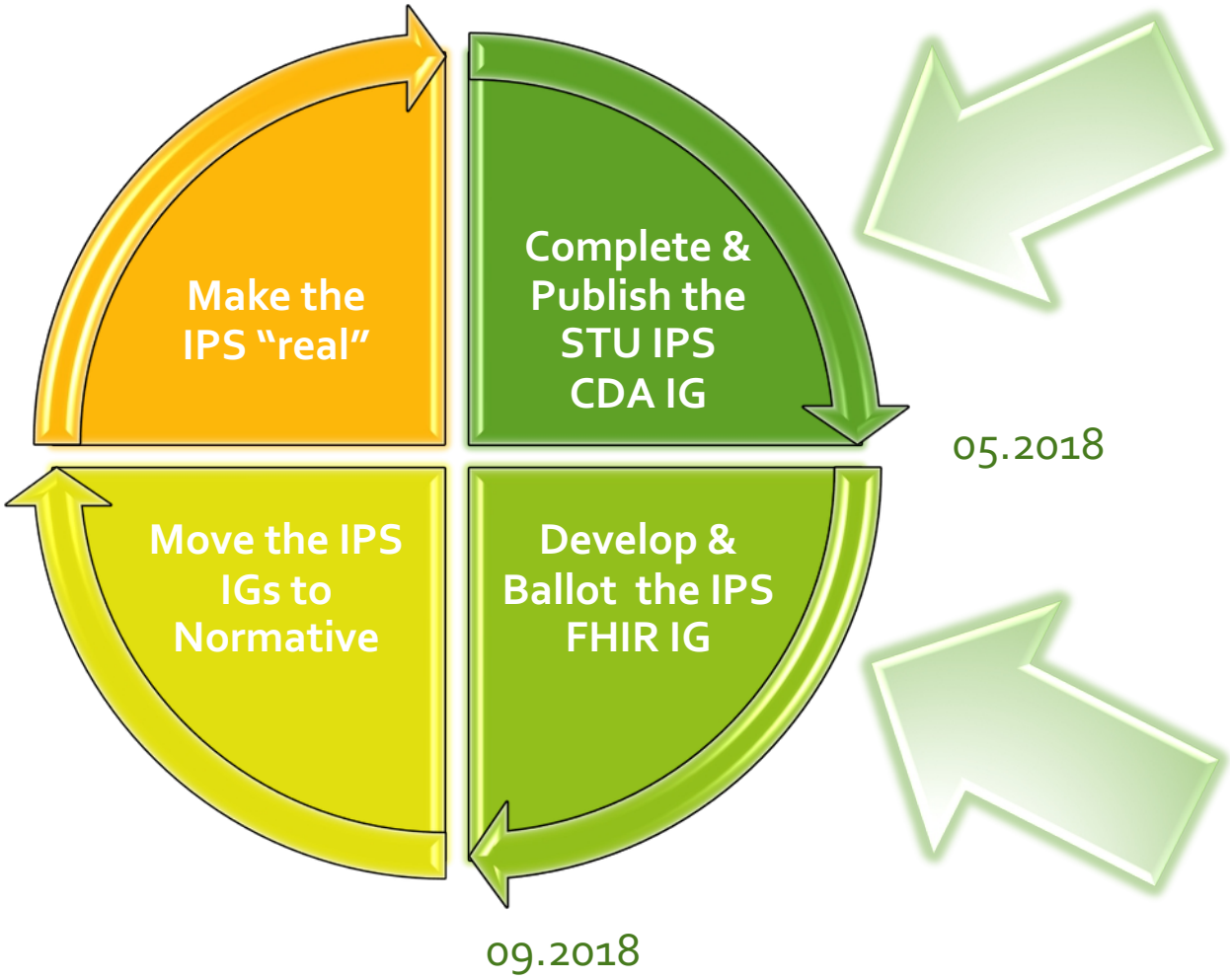
Allergies and Intolerances

Immunization

Plan of care



Follow-up


Make the IPS "real"
Complete & Publish the STU IPS CDA IG
05.2018
Move the IPS IGs to Normative
Develop & Ballot the IPS FHIR IG
09.2018

Resources

HL7 Deutschland

- Wiki
  - http://wiki.hl7.org/index.php?title=International_Patient_Summary_(IPS)
- Implementation Guide (Wiki for editing)
  - http://international-patient-summary.net/mediawiki/index.php?title=IPS_implementationguide_1
- ART-DECOR®
  - https://art-decor.org/art-decor/decor-project--hl7ips-
- FHIR IG: http://hl7.org/fhir/uv/ips/2018Sep/
- Mailing list
  - ips@hl7.org

A final word for today

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- This was about the structures and semantics of the International Patient Summary
- The greater challenge comes with the processes, that has to address questions like
  - When and why is an IPS generated? When updated?
  - By whom?
  - Automatically or human curated?
  - Who determines the content: human, algorithmic?
  - Who is the custodian of the IPS?

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VIELEN DANK!

Fragen?

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