

Can the Austrian nation-wide EHR system support the recruitment of trial patients?

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A decorative graphic consisting of several horizontal lines of varying lengths and colors (teal, white, and light blue) extending from the right side of the slide towards the center.

Topics

- Recruitment of trial patients
- Introduction to ELGA
- Open source tool suite ART-DECOR®
- Mapping trial criteria to ELGA
- Results and conclusion

Recruitment of trial patients (1)

- Standards for who can participate
 - Eligibility criteria: inclusion and exclusion criteria
- Time-consuming and expensive manual task
- Idea: automated comparison of EHR data with trial eligibility criteria

Recruitment of trial patients (2)

- EHR4CR reference list of commonly used eligibility criteria
- J. Doods, et al., A European inventory of data elements for patient recruitment, Stud Health Technol Inform 210 (2015)



EHR4CR data inventory for patient identification and recruitment

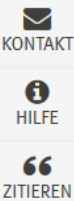
EHR4CR data inventory for patient identification and recruitment Referenced by <https://www.ncbi.nlm.nih.gov/pubmed/25991199>

Sprache ▾ 2 Zurück

EHR4CR data inventory for patient identification and recruitment

1 Formular ⌵

Name	Typ	Description Question Decode (Coded Value)	Datentyp	UMLS CUI
▼Demographics	Item Gr...	Patientendaten		
Date of Birth	Item	Geburtsdatum	date	C0421451
Gender	Item	Geschlecht	string	C0079399
Admission date	Item	Aufnahmedatum	date	C1302393
discharge date	Item	Entlassungsdatum	date	C2361123
Case Status	Item	Fallstatus	string	C0449437
▶ <u>Medical History</u>	Item Gr...	Anamnese		
▼Medical device	Item Gr...	Medizinprodukt		
▼Diagnosis	Item Gr...	Diagnose		
▼Procedure	Item Gr...	Prozeduren		
▼Findings	Item Gr...	Untersuchungsergebnisse		
▼Laboratory Findings	Item Gr...	Laborergebnisse		
▼Medication	Item Gr...	Medikation		
▼Scores&Classifications	Item Gr...	Scores&Classifications		
▼Patient Characteristics	Item Gr...	Patient Characteristics		



ELGA

- Nation-wide Austrian EHR system
- Operative since 2015
- Obligatory participation of all public hospitals, pharmacies and outpatient panel doctors
- HL7 CDA standard for ELGA documents
- Structure of ELGA document types specified as HL7 templates

ART-DECOR® (1)

- Open source tool suite
- Specification of informational concepts
- Design and management of HL7 templates

Left Screenshot: Demo 3: EKG Report CDA Document - Datasets

Project: Datasets | Scenarios | Terminology

Issues

Datasets | Concepts Decor Demo 3 dataset

Gender

Id: demo3-dataelement-40 | Version: 20

Status: Draft | Version Label

Description: Gender of the person

Value

Type	Code
Value Set	AdministrativeGender (2011-07-26)

Concepts

Concept	Code	Display Name	Codesystem
male	M		Administrati
female	F		Administrati

Usage (2)

Right Screenshot: Demo 3: EKG Report CDA Document - Templates

Project: Datasets | Scenarios | Terminology | Templates | Issues

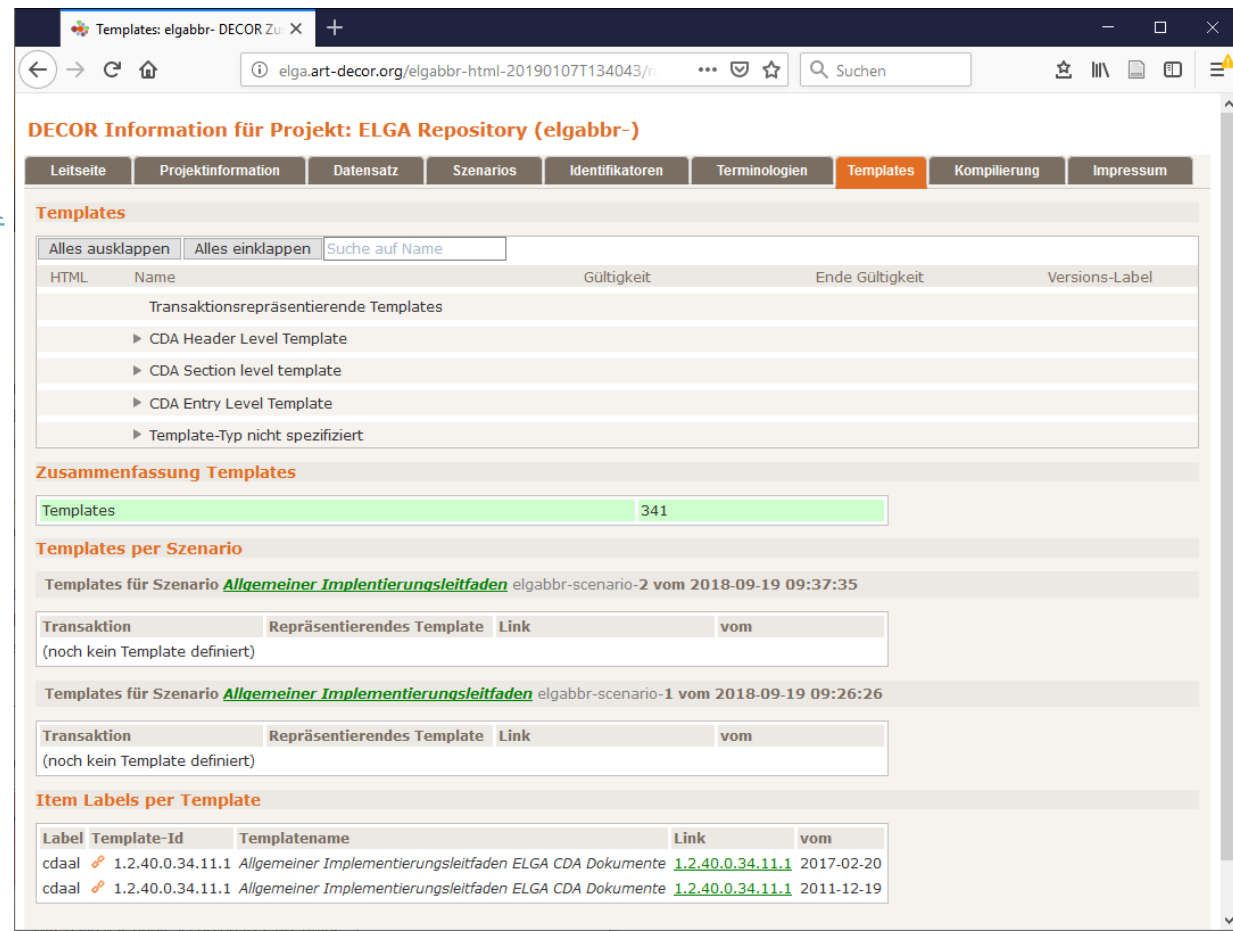
CDA recordTarget

Expand All | Collapse All | Search by name

Item	DT	Card	Conf	Description	Label
hl7:recordTarget					CDAr--rget
demo3-dataelement-1				Person	Decor
@typeCode	cs	0 ... 1	F	RCT	
@contextControlCode	cs	0 ... 1	F	OP	
hl7:patientRole		1 ... 1			CDAr--rget
@classCode	cs	0 ... 1	F	PAT	
Included		1 ... 1	R	from 2.16.840.1.113883.3.1937.99.60.3.10.110 Nat (DYNAMIC)	
hl7:patient		1 ... 1	R		CDAr--rget

ART-DECOR® (2)

- ELGA templates publicly available
 - <http://elga.art-decor.org/index.php?prefix=elgabbr->



DECOR Information für Projekt: ELGA Repository (elgabbr-)

Leitseite Projektinformation Datensatz Szenarios Identifikatoren Terminologien **Templates** Kompilierung Impressum

Templates

Alles ausklappen Alles einklappen Suche auf Name

HTML	Name	Gültigkeit	Ende Gültigkeit	Versions-Label
	Transaktionsrepräsentierende Templates			
	▶ CDA Header Level Template			
	▶ CDA Section level template			
	▶ CDA Entry Level Template			
	▶ Template-Typ nicht spezifiziert			

Zusammenfassung Templates

Templates 341

Templates per Szenario

Templates für Szenario [Allgemeiner Implementierungsleitfaden](#) elgabbr-szenario-2 vom 2018-09-19 09:37:35

Transaktion	Repräsentierendes Template	Link	vom
(noch kein Template definiert)			

Templates für Szenario [Allgemeiner Implementierungsleitfaden](#) elgabbr-szenario-1 vom 2018-09-19 09:26:26

Transaktion	Repräsentierendes Template	Link	vom
(noch kein Template definiert)			

Item Labels per Template

Label	Template-Id	Templatename	Link	vom
cdaal	1.2.40.0.34.11.1	Allgemeiner Implementierungsleitfaden ELGA CDA Dokumente	1.2.40.0.34.11.1	2017-02-20
cdaal	1.2.40.0.34.11.1	Allgemeiner Implementierungsleitfaden ELGA CDA Dokumente	1.2.40.0.34.11.1	2011-12-19

Research question

To what degree can the EHR4CR eligibility criteria be fed from ELGA data?

Methods (1)

- Represent EHR4CR criteria in ART-DECOR

The screenshot shows the ART-DECOR web application interface. The title bar reads "EHR4CR2ELGA - Datasets". The navigation menu includes "Project", "Datasets", "Scenarios", "Terminology", "Templates", and "Issues". The current view is "Concepts EHR4CR2ELGA".

The main content area displays details for a "Gender" dataset element. The details are as follows:

Id	EHR4CR2ELGA-dataelement-3	Version	2018-07-15 18:45:45
Status	Draft	Version Label	
Description	Geschlecht des Patienten		
Terminology Association	Code	Display Name	Codesystem
	C0079399		2.16.840.1.113883.6.86

Below the terminology association table, there is a "Value" section with a "Type" dropdown set to "Code".

At the bottom, there is a "Usage (2)" section.

The left sidebar shows a tree view of concepts, with "Gender" selected. Other concepts include Demographics, Date of Birth, Admission Date, Discharge Date, Case Status, Medical History, Medical device, Diagnosis, Procedure, Findings, Laboratory Findings, Medication, Scores&Classifications, and Patient Characteristics.

Methods (2)

- Map EHR4CR criteria to ELGA templates

EHR4CR2ELGA - Template mapping

Project Datasets Scenarios Terminology Templates Issues

Datasets **EHR4CR2ELGA**

- Demographics
 - Date of Birth
 - Gender**
 - Admission Date
 - Discharge Date
 - Case Status
- Medical History
- Medical device
- Diagnosis
- Procedure
- Findings
- Laboratory Findings
- Medication
- Scores&Classifications
- Patient Characteristics

Template Associations Concept: Gender

Templates Create template Create template association

Name	Id	Effective date	Element or attribute
HeaderRecordTarget	1.2.40.0.34.11.20001	2017-07-20	hl7:administrativeGenderCode
HeaderRecordTarget (Pflege)	1.2.40.0.34.11.20014	2017-03-27	hl7:administrativeGenderCode
HeaderRecordTarget	1.2.40.0.34.11.20001	2017-07-20	hl7:recordTarget

HeaderRecordTarget – 2017-07-20 (repository: elgabbr-) (repository)

Id 1.2.40.0.34.11.20001 **Effective Date** 2017-07-20
ref elgabbr- **Status** Draft **Version Label**

Templates

- CDA Header Level Template
 - HeaderRecordTarget
 - HeaderRecordTarget (Pflege)
 - HeaderServiceEvent
- CDA Section Level Template
- CDA Entry Level Template

Results (1)

- 148 ART-DECOR concepts for EHR4CR criteria
- ART-DECOR covers original data types
- Used more specific ART-DECOR data types where seemed appropriate, e.g.:
 - All lab findings: Float \Rightarrow Quantity
 - Gender: String \Rightarrow Code
 - Currently breast feeding: Text \Rightarrow Boolean

Results (2)

Of 148 criteria

- 90 (61%) mapped to structured ELGA elements
(e.g. lab values, diagnosis code, gender)
- 8 (5%) mapped to unstructured ELGA elements
(e.g. diagnosis text, procedure text, diet)
- 50 (34%) could not be mapped
(e.g. currently pregnant, currently breast feeding, menopausal status, spirometry, oxygen therapy)

Discussion (1)

Results comparable with earlier work

- [Ateya et al., 2016] \Rightarrow 74% of criteria from 228 trials likely to be fed from structured data elements in typical hospital EHR system
- [Köpcke et al., 2013] \Rightarrow 55% of criteria from 15 trials fed from recorded data of German university hospitals EHR systems
- [El Fadly et al., 2011] \Rightarrow 13.4% of 1 CRF data elements populated from French university hospital EHR system

Discussion (2)

- ELGA = nationwide interinstitutional EHR system
 - ☺ Larger patient cohort to be checked for eligibility
 - ☺ Criteria mapping to one single EHR data model
- But
- ☹ Narrower coverage of data elements
- We used common criteria, not „raw“ criteria from existing trials
- We mapped to ELGA templates, not documents
 - Could only check potential existence of data
 - Actual recording rate not considered

Conclusion

- High coverage of EHR4CR eligibility criteria by ELGA document types
- ELGA seems useful for nation-wide recruitment of Austrian trial patients
- Public ART Decor project at
 - <https://art-decor.org/art-decor/decor-project--ehr4cr2elga->

Thank you for your attention

The slide features a dark blue background. A horizontal band of teal and white lines spans the width of the slide, positioned above the text. The teal band is the topmost, followed by a white band, and then several thin teal lines. The text "Thank you for your attention" is centered horizontally within the white band.