

Discharge letter – Implantable Device (Cardiac) Follow-up

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INFOMED / HEALTH CARE ENGINEERING

Content

- HL7 Austria

- Business Case
 - In-clinic pacemaker follow-up

- CDA development
 - Use case analysis
 - Modeling
 - Implementation
 - Our solution / problems occurred

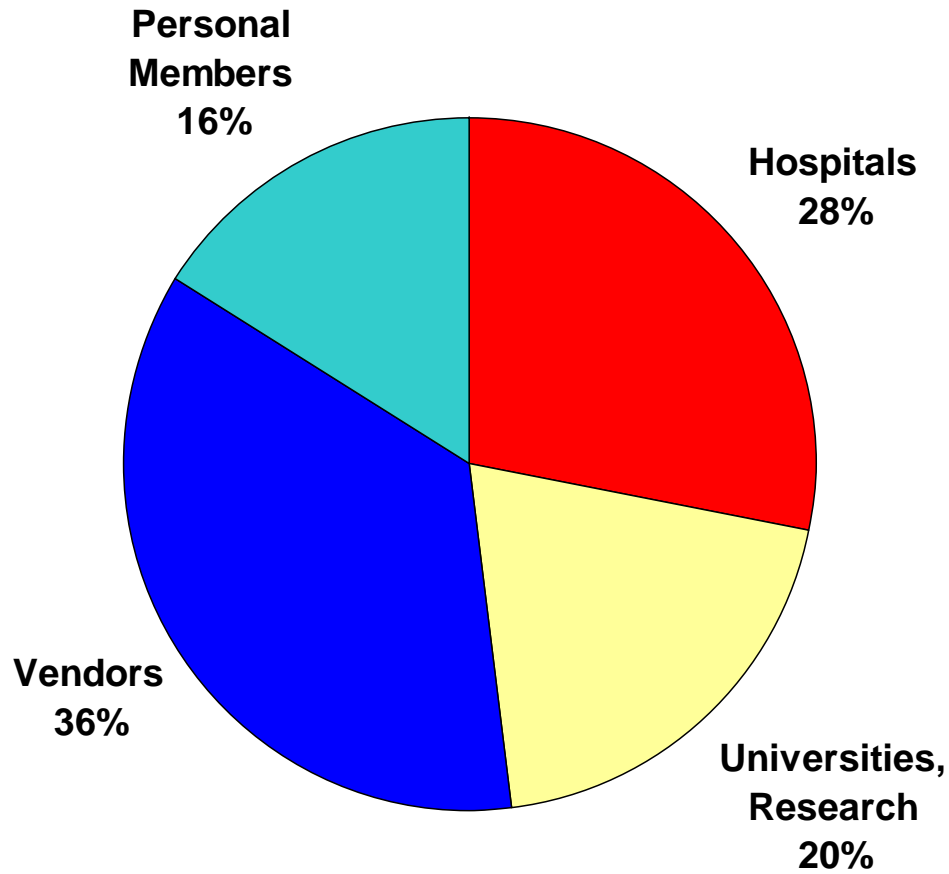
About HL7 Austria



- Established in 2007/01
- Go-live of Website www.hl7.at in 2007/02
- Officially recognized as an affiliate of Health Level Seven in 2007/07

- 2 Technical Committees
- Cooperation
 - Austrian Standards Institute
 - National EHR working group (with IHE Austria)
 - GS1 Austria

Members of HL7 Austria



N=25

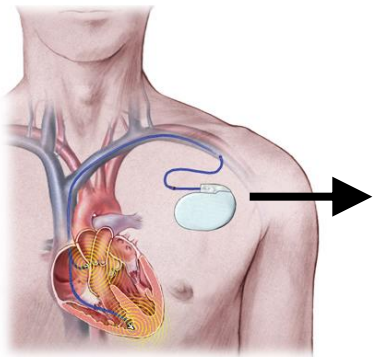
Activities



- Ballot for Z-Segments and realm-specific tables

- Collaboration with the Austrian Electronic Health Record Working group
 - Austrian Electronic Health Record „ELGA“
 - Specification of CDA Laboratory Report

In-clinic Pacemaker follow-up



now: paper record
50 – 200 parameters per examination

Better: Seamless integration in EHR

Use Case Analysis

- Content:
 - Review of guidelines &
 - physician interviews

- Domain Analysis Model
 - abstraction of real-world entities
 - static view of the structure of the clinical information
 - Identification of
 - **Entities**
 - **Roles**
 - **Participation**
 - **Act**

Header

- ELGA compliant

Body

- Anamnesis
- General Physical Findings
- Cardio-physiological Programming Parameters
- Additional cardio-phys. Parameters
- Medication
- Further Therapy Recommendation
- Details on next Follow-up

Modeling: Design Process

Discharge Letter - Implantable Device Cardiac Follow-up

Anamnesis

The pacemaker (Biotronik, Philos II DR) was implanted on the 19th of May 2008 at 120/80 mmHg.

General physical findings

The pacemaker works correctly.

Cardiophysiological parameters – programming parameters

Parameter	RA	RV	LV
Threshold	- V / - ms	- V / - ms	- V / - ms
Impedance	- kOhm	- kOhm	- kOhm
Pulse amplitude	3.6 V	5 V	- V
Pulse width	3.6 ms	5 ms	4 ms

Cardiophysiological parameters – programming parameters annotations

- Pulse amplitude (RA) is too high.

Cardiophysiological parameters – partly manually acquired data

Additional parameters	
Pacing rate	75 bpm
Battery voltage	- V
Expected lifetime	24 months
Magnet rate	55 bpm
Blood pressure	120/80 mmHg

XML

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Entry-level coding

XSL

```

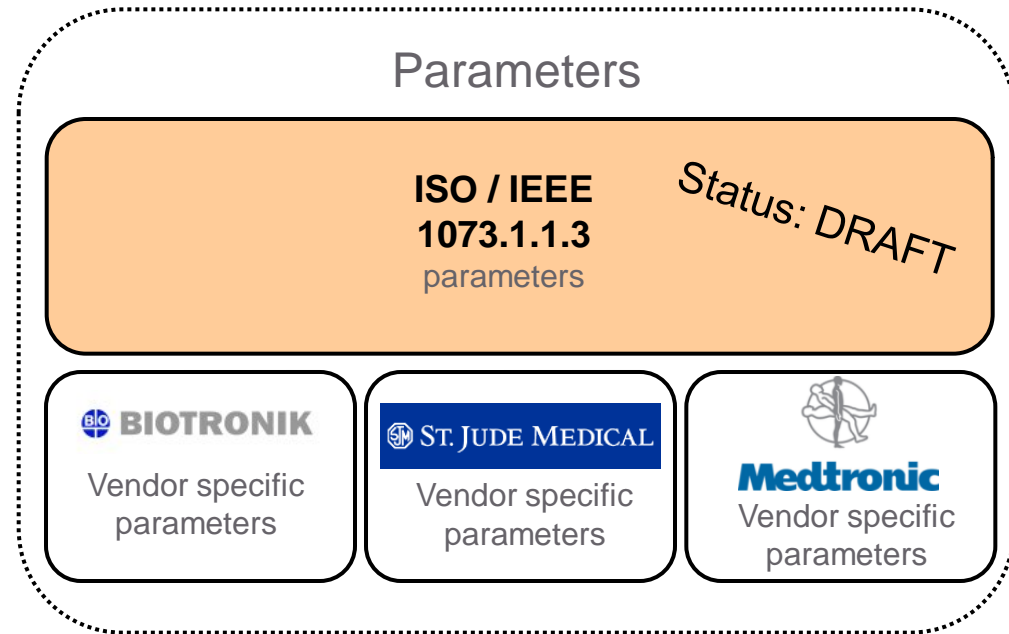
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      <xsl:value-of select="/n1:ClinicalDocument/n1:title"/>
    </xsl:when>
    <xsl:otherwise>Clinical Document</xsl:otherwise>
  </xsl:choose>
  </xsl:variable>
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    <xsl:apply-templates select="n1:ClinicalDocument"/>
  </xsl:template>
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        Document. </xsl:comment>
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      </title>
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```

XSL

VHITG-Stylesheet

Entry-Level Coding

- ISO/IEEE 1073.1.1.3
(Implantable Device Cardiac -
Nomenclature)
- Interpretation: HL7 abnormal
flags code list



Problems occurred:

Level 3 / entry-level coding:

- LOINC does not cover parameters for pacemaker-communication
- Handling vendor specific parameters not included by the ISO/IEEE 1073.1.1.3

Proposed CDA for „Implantable Device (Cardiac) Follow-up“

- **Content:**
 - European guidelines for cardiac pacing 2007
- **Implementation**
 - EHR Austria CDA header
 - ISO/IEEE 1073.1.1.3 (Implantable Device Cardiac - Nomenclature)
 - Interpretation: HL7 Table “abnormal flags”

Implementation

Data Input

- **Manual via Web-Interface:** examination data, interpretation, ...
- **Automatic:** pacemaker params

Cardiology Electronic Health Record



CdaGeneratorService

- generate
- validate
- send / display

Document Repository

Questions?

