Electronic Data-exchange for Diabetescare

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National program for ICT in healthcare

Eliminate dispersion:
- “Virtual integration of data from existing systems”
- not one large information system
- ICT-basis infrastructure (AORTA): minimal central infrastructure for safe data exchange
  - BSN (Burgerservicenummer)
  - UZI (Unique Careprofessional Identification)
  - LSP (National Switchboard)
- Rules & Standards
- Targets:
  - e-medication record
  - e-GP to GP record
Status AORTA (infrastructure)
Diabetes in the Netherlands

• ± 850,000 diabetes patients in the Netherlands: 600,000 are known and it is estimated that ± 250,000 are not yet diagnosed (RIVM, 2007)

• Increase expected of 35-60% in the next 20 years (type 2 DM)

Average annual prevalent of diabetes mellitus for age and gender. (CMR 2004)
Diabetes care groups in Netherlands

90 caregroups

Diabetes careprogram

Average 3,600 patients / 76 general practitioners per caregroup

source: Nulmeting zorggroepen, LVG 2008 (n=55)
Diabetes care group:

- multidisciplinary team of care professionals in the first line who operate according to the diabetes care standard of NDF.
- Has a contract for diabetes care with an insurer or is underway to obtain this.
National Action program Diabetes

- Initiative of the Netherlands Diabetes Federation and the Ministry of Volksgezondheid, Welzijn en Sport (healthcare).

- Purpose:
  - Limit growth of number of persons with diabetes (Increase 2005 - 2025 less than 15%).
  - Reduce Diabetes related complications (65% no complications).

Five themes:
1. Information and lifestyle intervention
2. Position of client & patient
3. Organisation, quality and knowledge
4. Regulation & Costs (DBC for continuity of care
5. EHR (e-Diabetes record) & ICT-infrastructure
Business Case e-Diabetes

■ For 93% of the caregroups ICT is an issue
  ■ different GP EHR’s (62%)
  ■ connecting to ICT-chain partners (40%)
  ■ no appropriate ICT-tools (38%)
  ■ information collection (36%)

■ Desired ICT-functions & requirements
  ■ Data - exchange outside the care group (79%)
  ■ Patient access (63%)
  ■ Internal data exchange (58%)

source: Nulmeting zorggroepen, LVG 2008 (n=55) & ICT-Monitor Diabeteszorg, Nictiz 2008 (n=25)
Advantages care professionals

- Professionals use their own information system
- Every moment and location complete and actual data available
- Secure and reliable communication
- Access to other EHR-services
- Reduce workload due to automatic reporting and alerts.
- Enter once, use multiple times
Purpose e-Diabetes Action Program

- within some years standards are available for:

• Exchange of electronic information among care professionals
Purpose e-Diabetes Action Program

- within some years standards are available for:

1. Exchange of electronic information among care professionals
2. Sharing the selfcare record
Purpose e-Diabetes

■ within some years standards are available for:

2 Sharing the selfcare record

3 Reporting (quality & Research)

Exchange of electronic information among care professionals
Standards Development

- Professional standards
  - **Diabetes Professional Care Guideline**: business & processes
  - **e-Diabetes dataset**: Inventory and data description that professionals want to exchange among themselves and with the patient (April 2008)
  - **Multidisciplinary indicators**: Harmonisation of the different sets and development of an uniform set of indicators (2009)

- Information standards
  - **Architectual design e-Diabetes (Phase 1)**: Description of architecture for electronic data exchange diabetes care as part of national infrastructure for EHR (Nov. 2008)
  - **HL7 implementation Guide for Care Provision**
  - **Mapping of Dataset to relevant code systems including LOINC and Snomed CT**
  - **Mapping data to HL7 v3 Care Provision messages**
  - **Detailed clinical Models**

- Technical Requirements
  - **Functional Requirements for EHR**
  - **Technical and functional tests (2009)**
Technical standards

Design

Translation of professional standards in a technical design with implementation guide and authorisation guidelines

Architectural design
(business, proces, information, technical)
Implementation Guideline HL7 v3 Care Provision
for use in e-Diabetes, using care profiles and DCM / templates
Requirements for EHR, LSP, GBZ
Interactions
E-Diabetes
DAM

Diagrammetje

- DM Risloopprofiel
  - Familieaanname
  - Fam. geschiedenis diabetes 1e graad
  - Roken
  - Alcohol
  - Etinicitte
  - Cardiovasculaire pathologie

- DM Medische basisgegevens
  - Lengte
  - Gewicht
  - Bloeddruk
  - Hypoglycemieën

- DM Diagnose
  - Datum
  - Type diabetes
  - Gesteld door

- DM Bloedgluucosemeter
  - Bezet
  - Datum controle
  - Gecontroleerd door

- DM Medische
  - Gebruikt orale antidiabetica
  - Gebruikt insuline
  - Betablockers
  - GU derivaat
  - Zeltregulatie insuline

- DM Streefwaarden
  - Gewicht
  - Bloedglucosewaarde nuchter
  - Systolische bloeddruk
  - HDL-cholesterol
  - LDL-cholesterol
  - Triglyceriden
  - Kreatinine
  - Plasma kalium

- DM Labonderzoek
  - Bloedglucosewaarde nuchter
  - Bloedglucosewaarde niet nuchter
  - gHb
  - HbA1c
  - HDL-cholesterol
  - LDL-cholesterol
  - Triglyceriden
  - Kreatinine
  - Plasma kalium

- DM Contaaf
  - Type contact
  - Status
  - Uitgevoerd onderzoek
  - Datum/Tijd
  - Vervolgafspraak
  - Zorginstelling

- DM Verwijzing
  - Verwijzing/consultatie
  - Verwezen naar
  - Reden

- DM Rapportage

- DM Voelonderzoek
  - Doorbloeding
  - Sensibiliteit
  - SIMMS classificatie

- DM Oogonderzoek
  - Diabetische retnopathie
  - Resultaat fundus screening
  - Advies o/b fundus screening
  - Diagnose door oogarts

- DM Voedingadvies
  - Diëtistische diagnose
  - Voedings-idietsadvies
  - Conclusie voedingsaanmaning
  - Evaluatie voedings-idietsadvies
Approach

Professional standards

Technical standards

Test

Adapt EHR/LSP

Test

Ready for market

e-Diabetes

Design

Implementation preparation
## Dataset e-Diabetes

<table>
<thead>
<tr>
<th>Hoofdstuk</th>
<th>Data element / parameter / variable</th>
<th>Operationalisatie / methode</th>
<th>Voorbeeld</th>
<th>Argumentatie</th>
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<tbody>
<tr>
<td>3.4.1</td>
<td>Summary risk factors heart and vessel diseases</td>
<td>Samenvatting risicofactoren HVZ</td>
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<td></td>
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<td>Hypercholesterolemie</td>
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<tr>
<td>670</td>
<td>Smoking</td>
<td>Roken</td>
<td>Ja</td>
<td></td>
</tr>
<tr>
<td>680</td>
<td>If quit smoking, date</td>
<td>Indien is gestopt, datum</td>
<td>MM/YYYY</td>
<td>10/2007</td>
</tr>
<tr>
<td>690</td>
<td>Motivation for stopping smoking</td>
<td>Motivatie stoppen met roken</td>
<td>Genoteerd</td>
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</tbody>
</table>
### E-Diabetes mapping HL7 v3

#### Example from English data set

<table>
<thead>
<tr>
<th>Hoofdstuk naam</th>
<th>Data element / parameter / variable</th>
<th>Care Provision Klasse</th>
<th>Attributen</th>
<th>Data type</th>
<th>Vocabulary identification (OID) / UCUM Unit</th>
<th>code voor code attributen</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4.1</td>
<td>summery risk factors heart and vessel diseases</td>
<td><strong>pertinentInformation3</strong></td>
<td>CareStatement</td>
<td>Observation</td>
<td>moodCode code negationInd effectiveTime</td>
<td>CS CD BL IVL_TS</td>
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<td>moodCode code effectiveTime value</td>
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</tr>
<tr>
<td>680</td>
<td>if quit smoking, date</td>
<td><strong>pertinentInformation3</strong></td>
<td>CareStatement</td>
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</tr>
</tbody>
</table>
DCM e-Diabetes

- DCM from Top 10 re-useable:
  - Blood pressure
  - Weight
  - Length

- Generic DCM
  - CMET PatientNL / PersonNL
  - Family assessment
  - Smoking, alcohol, exercise
  - Contact moments, consults
  - Allergies, contra indications
  - Cardiovascular pathology
  - Patient access, quality of life
DCM e-Diabetes

- DCM specific for e-Diabetes:
  - Social support in context of diabetes
  - Diabetes baseline medical data
  - Circumference
  - 24 hr Blood pressure, Ankle-arm index
  - Hypo-/ hyperglycemia
  - Target values
  - Foot investigation, Eye investigation
  - SIMMS classification
  - Medication use (insulin),
  - Blood glucose meter
Intermezzo

DCM project and next e- Diabetes examples
From the clinical perspective: the technical format is not that important, thus: OpenEHR archetypes = HL7 v3 template = HL7 v3 R-MIM = clinical data definition = 13606 archetype = XML representation = detailed clinical model, if **conceptual level is addressed**

In other words: medically it should be equivalent.

Of course from technical viewpoint – the level 2 modelling – it is not (completely) true, but hopefully a hypothetical approach to work with.
DCM organize:

- Clinical content
- Quality issues:
  - Vocabulary binding
  - Metadata
  - etc
- Modeling
- Repository
- See DCM workshop report distributed by ISO, and the summary in proceedings
Workshop outcome 1

Clinician engagement

1. Capturing clinical domain knowledge
   - Method of collection
   - Expert users
   - Sources
   - Existing resources
   - Identify gaps
   - Document evidence above

2. Collaboration re terminology/subsets
3. Modelling
4. Reviewing new/existing clinical models

Teaching module re engaging clinicians
   - Review process
   - Guidance re using existing guidelines and protocols for modelling
   - Raising clinical content capture to professional organisational responsibility

Model evaluation criteria readable by average clinician

Plan

For facilitators
Status DCM April 2009

- Reported on several JWG (ISO 9) and HL7 meetings
- HL7 (2008) project DCM to develop Top 10: ready
- ISO WG 1 lead project (Vienna A) CEN WG1, CDISC leadership, HL7 TSC approved NWIP on DCM is open for voting now. (No JIC status yet, but 4 of 5 JIC members formally supporting).
- HL7 template registry plan under discussion: simple storing and making available HL7 templates, UML, archetypes and DCM.
- ISO NIWP project team ready to run, William Goossen project lead
- First draft draft draft standard on DCM submitted, vote underway
- HL7 CIC and EHR: how to ballot: discussion now
DCM e-Diabetes

- DCM diagnosis for later in 2009
- DCM Care Plan for later in 2009

In conjunction with HL7 Patient Care work
Requirements e-Diabetes

- Idea is to have documents on requirements for a virtual EHR for clinicians
- Use of ISO 18308 baseline
- Use of HL7 Functional Profile?
- Consensus approach planned