APPLYING HL7 FHIR TO DIABETES INFORMATION EXCHANGE

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Research supported by PON04a2_C SMART Health 2.0
Aim

✔ HL7® FHIR® based solution to standardize the exchange of diabetes healthcare information among Electronic Health Record (EHR), Personal Health Record (PHR), and Practitioners Medical Records

✔ Clinical dataset for the diabetes diagnostic and therapeutic pathways based on regional specifications (Tuscany region) are mapped into FHIR resources

✔ A Client/Server RESTful implementation under development
Our previous work

> Enabling Primary and Specialist Care Interoperability through HL7 CDA Release 2 and the Chronic Care Model: an Italian case study

> e.Toscana compliance RFC 238: diabetes clinical dataset and use cases specification for diagnostic and therapeutic pathways to share patient clinical data among HS and GP through the access to EHR
Actors

→ Patients interacting with EHR and PHR
→ General Practitioners (GP) accessing the EHR
→ Hospital Specialists (HS) accessing the EHR
→ Patients measuring their vital signs through specific devices accessing PHR (Telemonitoring)
Akers & Services Interaction
Based Diabetes Services

→ To enable interoperability of diabetes clinical data from heterogeneous sources we develop a FHIR based interface using suitable resources, extensions and profiles.

→ Mapping of the diabetes clinical dataset specification to the FHIR resources and resources for the devices specified in the IHE Patient Care Device (PCD)
### Mapping of the Diabetes Clinical Dataset

<table>
<thead>
<tr>
<th>RFC 238 Sections</th>
<th>FHIR Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
<td>Patient</td>
</tr>
<tr>
<td>Hospital Specialist</td>
<td>Practitioner</td>
</tr>
<tr>
<td>General Practitioner</td>
<td>Practitioner</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Condition</td>
</tr>
<tr>
<td>Intervention/Procedures</td>
<td>Procedures</td>
</tr>
<tr>
<td>Laboratory Exams</td>
<td>DiagnosticReport, Observation</td>
</tr>
<tr>
<td>Visits/Encounters</td>
<td>Encounter</td>
</tr>
<tr>
<td>Diagnostic Tests</td>
<td>DiagnosticReport, Observation</td>
</tr>
<tr>
<td>Medications</td>
<td>MedicationAdministration</td>
</tr>
<tr>
<td>Vital Signs</td>
<td>Observation</td>
</tr>
<tr>
<td>Life Style</td>
<td>Observation</td>
</tr>
<tr>
<td><strong>IHE PCD</strong></td>
<td>Device, Observation</td>
</tr>
<tr>
<td></td>
<td>DeviceObservationReport</td>
</tr>
</tbody>
</table>
A Client/Server RESTful implementation of main operations (Create, Read, Update, Delete) using open sources HAPI FHIR

→ HAPI RESTful Server, a fully contained FHIR server implementation with a persistence module backed by a database

→ Client web-application with User Interface to create, update, delete, and search resources (Patient, Observation, DiagnosticReport, etc.)

< Hapi / >

HAPI-FHIR
fhir made simple.
HAPI-FHIR Server

This is the home for the FHIR test server operated by University Health Network. This server (and the testing application you are currently using to access it) is entirely built using HAPI-FHIR, a 100% open-source Java implementation of the FHIR specification.

Here are some things you might wish to try:

- View a list of patients on the server.
- Construct a search query on the server.
- Access a different server (use the Server menu at the top of the page to see a list of public FHIR servers)

⚠️ This is not a production server! Do not store any information here that contains personal health information or any other confidential information. This server will be regularly purged and reseeded with fixed test data.

Server
- Example Server

Software
- HAPI FHIR Server 1.0

FHIR Base

Server Actions

- Remove the server’s performance statement.
- Retrieve the update history across all resource types on the server.
- Post a bundle containing multiple resources to the server and store all resources within a single atomic transaction.
- Get tags currently in use on the server.

EMBC 2015
37TH ANNUAL INTERNATIONAL CONFERENCE OF THE
IEEE Engineering in Medicine and Biology Society
MiCo - Milano Conference Center - Milan, Italy, August 25-29 2015
Client User Interface
Future Work

→ Resource extension and profiles definition

→ Document handling

→ User Interface design and implementation of the client side on mobile device

→ Implementation with HL7 FHIRframe Mobile Health API/Library when available

→ Authentication and identification based on OAuth2 service necessary to grant security and privacy
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