Medication Statement Service hData Content Profile Definition

The following additional information is included in the documentation package for this hData Content Profile (HCP):

<table>
<thead>
<tr>
<th>Documentation</th>
<th>Requirement</th>
<th>Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCP definition document (see section 3.3 of the HL7 hData Record Format V1 specification)</td>
<td>REQUIRED</td>
<td>YES</td>
</tr>
<tr>
<td>Complete set of XML Schemas, OWLs, or other relevant syntax and semantics definitions</td>
<td>REQUIRED</td>
<td>YES, by reference.</td>
</tr>
<tr>
<td>Sample instance</td>
<td>OPTIONAL</td>
<td>NO</td>
</tr>
<tr>
<td>Transforms to CDA/XML ITS</td>
<td>OPTIONAL</td>
<td>NO</td>
</tr>
<tr>
<td>Additional documentation (please specify)</td>
<td>OPTIONAL</td>
<td>NO</td>
</tr>
</tbody>
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1 Identification

<table>
<thead>
<tr>
<th>Name:</th>
<th>Medication Statement Service HCP</th>
</tr>
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<tbody>
<tr>
<td>Version aware Identifier (URL):</td>
<td><a href="http://hl7.org/hdata/pharmacy/2012/02/medicationStatementService">http://hl7.org/hdata/pharmacy/2012/02/medicationStatementService</a></td>
</tr>
<tr>
<td>Creation Date:</td>
<td>2012-07-20</td>
</tr>
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Summary:

This HCP describes a Medication Statement service. It defines the actual content (precise data model and representation approach), its semantics, behavioral model, and service functionality. The IG must address the requirements of both REST services as well as SOAP-based web services.

A Medication Statement Service can support real-world activities, such as e.g. decision support, by providing a composable and orchestratable distributed resource.

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John Hatem
David Hay
2 Change Log

<table>
<thead>
<tr>
<th>Date</th>
<th>Author(s)</th>
<th>Version URL</th>
<th>Major Changes</th>
<th>Comments</th>
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<tbody>
<tr>
<td>2012-07-10</td>
<td>Beuchelt</td>
<td>TBD</td>
<td>Initial version</td>
<td>N/A</td>
</tr>
</tbody>
</table>

3 Use Cases

The use cases below are focused on those found in the HL7 specifications for medication statements. The specific use case artifact identifiers are provided, and can be dereferenced in the HL7v3 standard.

At the same time, the medication statement can be utilized to address a number of other use cases, including use cases centered around the availability of discrete medication statements.

3.1 Record a Medication Statement to the patient history (PORX_SN040010UV)

Adam Everyman has been to visit his local after hours clinic in the hospital and was given a supply of Maxalt, a new anti-migraine medication. His headaches have subsided. When he visits Dr. Fay Family, his family physician for his next appointment, Dr Family inquires if he has any changes to his current medication list, including any over the counter medications.

Adam tells Dr. Family of his visit to the hospital clinic and of receiving and taking the Maxalt. Adam tells Dr Family that he got quick relief from the medication and that he still has three tablets remaining. With Adams permission, Dr Family adds the Maxalt to Adam's current medication list (PORX_IN040010UV). Dr Family resolves any questions about the safety and long term use of the Maxalt with Adam.

Dr. Family then proceeds to examine Adam for his current concern of elevated blood pressure.

3.2 Doctor records medication statements in EHR system (PORX_SN0400051UV)

Adam Everyman, a senior retired citizen, is being admitted to the Blue Cross Hospital for operation on his prostate glands. As a standard procedure he is being interviewed on his medication usage. Adam has taken his daughter Dorothy along because his memory is not what it used to be. They are interviewed by the hospital
pharmacist. Adam brought his pill box along to show them to the pharmacist. Beside the atenolol for his hypertension, Adam also uses Aspirin/ASA as a blood thinner. These medication are prescribed by his general practitioner. He also uses a mysterious ginseng product from the Chinese herbal drugstore to enhance his memory and an ointment for his eczema rash in his neck. This ointment was prescribed during his holiday in Egypt and works remarkably well for Adam. Dorothy explains to the pharmacist the reason, the origin and the frequency of the usage of the medication.

The pharmacist registers this information in the main EHR system of the Blue Cross Hospital and sends a copy of this information with the medication statement message to their separate institutional pharmacy system. (PORX_IN040010UV) in both cases.

3.3 Patient Records medication statements in PHR syst (PORX_SN040052UV)
Lucy Lindman has thrombosis. Her blood is examined every week by the blood lab and the lab sends in the results to thrombosis health service. The dosage of her blood thinner is adjusted according to the results of the thickness of her blood. These instructions are sent to Lucy on her PHR. Lucy registers her daily dosage through her patient portal. Lucy also suffers from migraine and uses Aspirine to enlighten the headache. She also registers the usage of this OTC medication, which she obtained from the neighbourhood drugstore. Her PHR system sends a daily message using a medication statement message to the EHR system of her GP. (PORX_IN040010UV)

3.4 Doctor checks for actual use (PORX_SN400053UV)
In order to keep his records up-to-date, the GP (General Physician) of Adam Everyman pulls up a list of all known, active prescriptions and any associated dispenses (if present) for Mr. Everyman (these might be obtained from a central repository or via some form of transparent access to distributed sources). She then reviews that list with Mr. Everyman, to check his compliance with the prescriptions. In some cases, the screen will show that the prescribed medication was never picked up from a pharmacy, in others (where a dispense did occur) Mr. Everyman might confirm that he's using the medication as prescribed, but he might also state that he never started using the medication at all, or that he did, but stopped early, or that he used it with a different (possibly variable) dosage. For each of the prescribed medications, a medication statement is then recorded to capture the actual use of the medication (including the cases where there was no use). Depending on the architecture, this might lead to three different exchange methods:

A notification is sent to any systems that are tracking medication statements. (PORX_IN040010UV)
A request to record is sent to a central repository (PORX_IN040020UV), and then accepted (PORX_IN040033UV) or refused (PORX_IN040040UV).
The medication statements are stored in the local database until a query comes in (PORX_IN040050UV), after which the relevant statements are returned as the query response (PORX_IN040052UV).

3.5 Medication Statement Queries

For this use case, a number of different standard queries (as contained in PORX_RM040030UV) are modeled for an RLUS/hData implementation.

For hData, the URL for the resource to formulate specific query is:

```
baseURL/org.hl7/pharmacy/medicationstatement/search
```

The SC receives a list of Atom feed entries linking (through atom:link) to PORX_RM040010UV documents.

3.5.1 Obtain Medication List For Patient

A service consumer (SC) queries for the list of current medications\(^1\) for a patient. By default, this will not include medication statements that have been negated.

For hData over REST transport, this is performed by performing an HTTP GET request without query parameters at the URI representing the patient’s medication statement hData section path.

3.5.2 Obtain specific Medication Statements

A service consumer queries for one of the following parameters:

- PrescriptionId
- EncounterId
- AuthorTime (time when statement was made)
- EffectiveTime (time when medication was taken)
- IncludeNegated (may have a value of “yes” or “no”)

All of these parameters are optional and single valued. If the “IncludeNegated” is set to “yes”, the results must include negated statements.

For the hData REST transport any or all of these parameters should be key/value encoded in the search query string, in conformance with section 6.6 of the Data REST Transport.

In order to transfer a query message (PORX_XXX), the query message should be serialized through the HL7 XML-ITS, base64 encoded and used in the URL as a query parameter.

\(^1\) For the purpose of this document, “current medications” are defined to be medications that may have been taken within the last 6 months.
4 Behavioral Model

This first subsection recognizes the use cases identified in the HL7 v3 messaging standard. These use cases have been identified by the messaging standard as core use cases for medication statements. At the same time, this service is capable of making available individual medication statements outside the context of a messaging interaction.

It should be noted that states such as “Created”, “Updated”, or “Nullified” are specific to the exchange paradigm. While these states make sense in a messaging environment, a service environment separates the ‘public’ state from the internal representation.

As such, this specification requires that all implementers MUST keep a detailed record of every medication statement that was created. At the same time, a query for ‘active’ or ‘current’ medications does not need to return medication statements that were nullified or deleted.

Medication Statements can be Created, Updated, Nullified and Queried\(^2\). The following diagrams illustrate the content of each of the interactions and the subsequent narratives provide concrete examples that are tied back to specific interactions. The drawings illustrate a Simple Architecture in the upper section, and a more complex Hub Architecture (this is the pattern used in Canada) in the lower drawing. The principle difference between the architectures lies in the ownership of the data. In the Simple Architecture the data is owned by the originator of the data and they are allowed to do as they wish with the data. In contrast in the Hub Architecture the data is owned by the center and records can only be added to this, updated, nullified etc. if the Hub agrees.

The exception to this are the Query interactions - even in a Hub Architecture there is no need to seek permission to raise a query.

\(^2\) See section 4.2 for an interpretation of the status of medication statements.
4.1 Medication Statement Update

Medication Statement Update

**Update Medication Statement (PORX_IN040011UV)**
Someone wishes to make changes to an existing details of someone’s medication (Simple Architecture)

1) Medication Statement has been Updated
PORX_TE040040UV

2) Medication Statement Record Notification
PORX_MT030010UV

**Request to Update Medication Statement (PORX_IN040051UV)**
& **Request to Update Medication Statement Accepted (PORX_IN040090UV)**
& **Request to Update Medication Statement Refused (PORX_IN040080UV)**

Someone wishes to make changes to an existing details of someone’s medication (Hub Architecture)

1) Request to Update a Medication Statement
PORX_TE040070UV

2) Medication Statement Record Notification
PORX_MT030010UV

4a) Order Id
PORX_MT030020UV
Application Level Acknowledgement

4b) Request to Update Medication Statement Refused
Application Level Acknowledgement

3a) Medication Statement has been Updated
PORX_TE040040UV

3b) Reject Request to Update Medication Statement
PORX_TE040020UV
4.2 Medication Statement Nullification

Medication Statement Nullification

Nullify Medication Statement (PORX_IN040012UV)
Someone has recorded something about someone’s medication in error and now wishes to cancel that record
(Simple Architecture)

1) Medication Statement has been
Nullified
PORX_TE040032UV

2) Order Id
PORX_MT090020UV

Request to Nullify Medication Statement (PORX_IN04021UV)
& Request to Nullify Medication Statement Accepted (PORX_IN040034UV)
& Request to Nullify Medication Statement Refused (PORX_IN040041UV)
Someone has recorded something about someone’s medication in error and now wishes to cancel that record
(Hub Architecture)

1) Request to Nullify a Medication
Statement
PORX_TE040052UV

2) Order Id
PORX_MT090020UV

4a) Order Id
PORX_MT090020UV

3a) Medication Statement has been
Nullified
PORX_TE040032UV

3b) Reject Request to Nullify
Medication Statement
PORX_TE0940014UV

4b) Request to Nullify Medication Statement
Refused

Application Level Acknowledgement

4.3 Medication Statement Query

Medication Statement Query (PORX_IN040050UV)

Response to Medication Statement Query (PORX_IN040052UV)
Someone wishes to know what medication statements have been recorded

3) Medication Statement has
been Recorded
PORX_TE040030UV

2) Medication Statement Event Query
PORX_MT040030UV

1) Medication Statement
Query Request
PORX_TE040050UV

4) Medication Statement Record Notification
PORX_MT040010UV
4.4 Medication Statement Recording

Medication Statement Recording

Record Medication Statement (PORX_IN040010UV)
Someone wishes to record something about someone’s medication (Simple Architecture)

1) Medication Statement has been Recorded
PORX_TE040030UV

2) Medication Statement Record Notification
PORX_MT040010UV

Medication Statement Request to Record (PORX_IN04020UV)
& Request to Record Medication Statement Accepted (PORX_IN040033UV)
& Request to Record Medication Statement Refused (PORX_IN040040UV)
Someone wishes to record something about someone’s medication (Hub Architecture)

1) Request to Record a Medication Statement
PORX_TE040060UV

2) Medication Statement Record Notification
PORX_MT040010UV

4a) Order Id
Application Level Acknowledgement
PORX_MT040020UV

4b) Request to Record Medication Statement Refused
Application Level Acknowledgement

3a) Medication Statement has been Recorded
PORX_TE040030UV

3b) Reject Request to Record Medication Statement
PORX_TE040010UV

5 Record Semantics

5.1 Scope and lifecycle of a record

5.1.1 Record scope
One record covers a single medication statement.

5.1.2 Record creation

Creation of a new medication statement is documented in section 4.4 – Medication Statement recording.
5.1.3 Record modification

Modification of the single statement are described in section 4.1 – Medication Statement Update.

Modifications imply that the older version of the statement is maintained and a relationship: old/new is maintained. However maintenance of this audit trail is separately the responsibility of the sending and receiving systems. Sending a modified statement does not require the sending statement to also send all the previous versions of this medication statement.

For hData transports that support access to older versions SHOULD be enabled.

5.1.4 Record deletion

In medical record systems “deleting” a record is a change to a record status of deleted. It does not mean that the medication statement is actually deleted. As such deletion is a variation of “Update”. This corresponds to an Obsoletion.

If a system receives a record that is “Deleted” which it has never seen before it is not expected to save that medication statement.

5.2 Semantics of the sectional structure

The medication statements for this service are stored in the

/org.hl7/pharmacy/medicationstatement

Section of the hData Record. The first and second level Sections are for organizational purposes only, and have an empty contentType. The

6 Master Documentation

6.1 Purpose

The Medication Statement Service HCP provides an RLUS compliant create, read, update, delete service for medication statements. Such as service is a necessary requirement for service-based, orchestrated pharmacy service such as e.g. a medication prescription decision support service, which would need to access medication statements for drug-drug interaction verification.
7 Appendix

7.1 hData Content Profile Document
This document describes the sectional outlay for this HCP.

<?xml version="1.0" encoding="UTF-8"?>
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xmlns="http://hl7.org/hdata/schemas/2010/04/hcp"
xmlns:hrf="http://hl7.org/hdata/schemas/2009/06/core"
id="http://hl7.org/hdata/pharmacy/2012/02/medicationStatementService"
name="Medication Statement Service hData Content Profile" >
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  urn:empty
</hrf:extension>
<hrf:extension extensionId="1"
  contentType="application/xml">
  http://hl7.org/v3/pharmacy/2012/02/medicationStatementService
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</hrf:extensions>
<hrf:sections>
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  extensionId="0"
  requirement="required">
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    extensionId="0"
    requirement="required">
    <hrf:section path="medicationstatement"
      extensionId="1"
      requirement="required"/>
  </hrf:section>
</hrf:section>
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</hcp>

7.2 Schemas for Medication Statement
The following identifier should be used for the extension:

http://hl7.org/v3/pharmacy/2012/02/medicationStatementService

The schema for PORX_MT40010UV is part of the HL7V3 normative edition, and can be found there.