

The Relationship between Archetypes, Templates, Terminology and the HL7 RIM

By

Peter L. Elkin, MD
Sam Heard, MD
Peter Schloeffel, MD
Thomas Beale



© Copyright Mayo Foundation for Medical Education and Research 2004

HL7 - Templates

1. Constraints on Content and Structure
2. System to allow / constrain the appropriate use of Templates in HL7 Messages



© Copyright Mayo Foundation for Medical Education and Research 2004

HL7 Templates

- Constraint System for HL7 Messages
 - Unambiguous Concept Representation
 - Format for attaching values to concepts
 - Communication of Document Structure



© Copyright Mayo Foundation for Medical Education and Research 2004

Unambiguous Concept Representation

- Necessary for Compositional Terminologies which are not fully specified
- Necessary for environments where multiple terminologies are used and ideal behavior can not be guaranteed.



© Copyright Mayo Foundation for Medical Education and Research 2004

Unambiguous Concept Representation

- Template (Vital Signs)
 - Slots (Named in LOINC)
 - Allowable Codes
 - Terminology (e.g. SNOMED)
 - Code (e.g. Systolic Blood Pressure)
 - Values (Association of “137” with the code above)
 - Slots can be hierarchically arranged.
 - Blood Pressure can Subsume
 - Systolic Blood Pressure
 - Diastolic Blood Pressure



© Copyright Mayo Foundation for Medical Education and Research 2004

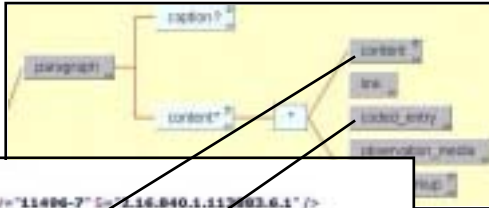
Format for attaching values to concepts

- Many concepts are composite concepts with a defined structure
 - Blood Pressure (BP)
 - Systolic BP
 - Diastolic BP
 - Orthostatic Blood Pressures
 - Lying BP
 - Sitting BP
 - Standing BP



© Copyright Mayo Foundation for Medical Education and Research 2004

Clinical Document Architecture



```

<caption>
  <caption_id V="11600-7" S="3.16.040.1.112893.6.1" />
  Assessment
</caption>
<list>
  <list>
    <comment>
      <content_id V="String01" S="Assessment"/>
      <comment>
        , with pituitary disease. Difficulty weaning off steroids. Will
        try gradual taper.
    </comment>
    <caption.entry>
      <caption.entry_value ORIGIN="String01" V="D2-51000"
        S="3.16.040.1.112893.6.1" />
    </caption.entry>
  </list>
</list>

```

```

archetype
  open ehr-ehr-observation.bp_measurement.draft
concept
  [at0000] -- blood pressure measurement
description
  author = <"Sam Heard <sh.heard@bt.tlrock.com>">
  submission = <
    organisation = <"openEHR Foundation">
    date = <2003-06-10>
    version = <"version">
    status = <"draft">
    revision = <"1.0">
    description("en") = <
      purpose = <"Describe systemic blood pressure measurement result and protocol">
      use = <"">
      misuse = <"">
      adl_version = <"0.9">
      rights = <"">

```



© Copyright Mayo Foundation for Medical Education and Research 2004

HL7 - CDA - XML

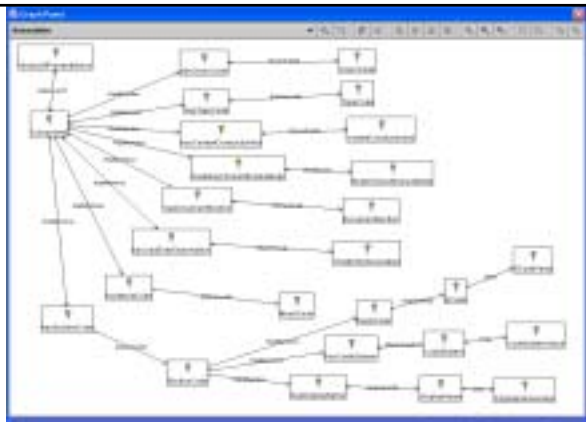
```

<?xml version="1.0" encoding="UTF-8" />
<DOCTYPE html SYSTEM "Notes/HL7.RTF.DTD" [
  <ENTITY deg "&#x00B0;" />
  <ENTITY sup2 "&#x00B2;" />
  <ENTITY mkr0 "&#x00B5;" />
]>
<development>
  <clinicalDocumentHeader>
    <id EX="RT" />
    <set_id EX="RT" />
    <version_nbr V="1.0" />
    <document_type_cd V="openehr-ehr-observation.bp_measurement.draft"
      S="DN=blood pressure measurement" />
    <originator_dtm V="20030610T12:00:00" />
    <confidentiality_cd V="S" />
    <patient encounter>
      <practice_setting_cd V="S" S="DN=" />
      <encounter_id V="S" />
      <service_location>
        <id EX="RT" />
      </service_location>
      <patient encounter>
        <legal_authenticator_type_cd V="S" />
        <participation_tm V="S" />
        <signature_cd V="S" />
        <person>
          <id EX="RT" />
          <person_name>
            <nm>
              <GIV V="S" />
              <MID V="S" />
              <F AM V="S" />
              <F FX V="S" />
              <S FX V="S" />
            </nm>
            <person_name_type_cd V="S" />
            <person_name>
              <telecom V="S" USE="S" />
            </person_name>
          </person>

```



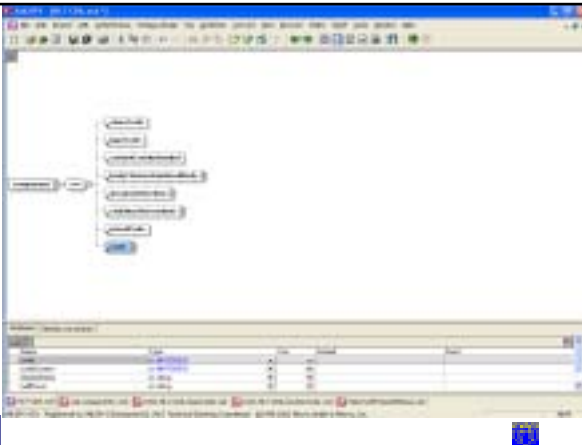
© Copyright Mayo Foundation for Medical Education and Research 2004



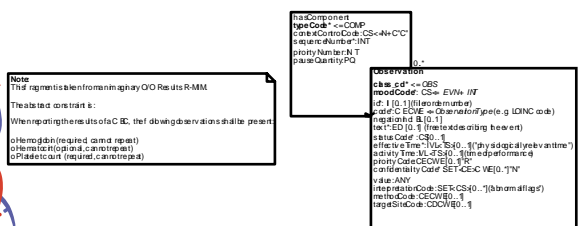
© Copyright Mayo Foundation for Medical Education and Research 2004

HL7 Templates R-MIM Fragment

- The R-MIM fragment (graphically represented here) can be converted to OWL Abstract Syntax (next slide), and used as a definition model for template development and validation



© Copyright Mayo Foundation for Medical Education and Research 2004



© Copyright Mayo Foundation for Medical Education and Research 2004

Show Blood Pressure Archetype



© Copyright Mayo Foundation for Medical Education and Research 2004

Show Blood Pressure Archetype / XML Output



© Copyright Mayo Foundation for Medical Education and Research 2004

Show Blood Pressure OWL:Archetype



Formal Definition



© Copyright Mayo Foundation for Medical Education and Research 2004

ebXML Registry

- Both the R-MIM Fragment and the full OWL_CBC.xml Template can be stored, with meta-data in ebXML. This will allow automated Template validation and ease of retrieval and submission of Templates and Fragments.
- The following slides are snapshots of the ebXML Registry browser showing the XML R-MIM_Fragment.xml Object, and it's associations with the OWL_CBC.xml Template



© Copyright Mayo Foundation for Medical Education and Research 2004

ebXML Registry Object Browser



© Copyright Mayo Foundation for Medical Education and Research 2004

Extrinsic Object Meta-Data Model



© Copyright Mayo Foundation for Medical Education and Research 2004

Next Steps

- Select groups can submit valid R-MIM Fragments in OWL:Archetypes syntax to the ebXML Registry.
- Develop software for HL7 Template Validation in ebXML.
- Allow groups to submit HL7 Templates composed in OWL:Archetypes/XML to be validated against registered R-MIM Fragments
- Develop software to validate instances of an HL7 Template against the registered HL7 Template in OWL:Archetypes/XML syntax
- Allow groups to validate their HL7 messages against registered instances of HL7 Templates in OWL:Archetypes/XML.



LBI
Laboratory
Biomedical
Informatics

© Copyright Mayo Foundation for Medical Education and Research 2004

Conclusion:

- Join the HL7 Templates SIG
 - *Where the Action is...*
 - *Where the Rubber Meets the Road...*
 - **Looking for hard working creative individuals to dedicate themselves to making interoperability a reality**
 - *Discussion:*
- **Thank You for Your Kind Attention!**



LBI
Laboratory
Biomedical
Informatics

© Copyright Mayo Foundation for Medical Education and Research 2004