Laboratory Panels &Tests Discussions

(a.k.a. Observation Groups verses Atomic Observations)

Requirements

- To recognise the smallest piece of information that you can sensibly say about a patient.
- Ensure query paths to these pieces can be consistent
- A test should be able to appear in more than one type of panel

Principle

- The reference model should be able to support new use cases
- The reference model should have no healthcare semantics
- Healthcare semantics should be represented in reference archetypes above the reference model (patterns)

Options

- Option 1: Sections & Entries
- Option 2: Entries & Clusters
- Option 3: Templated ‘Uber Model’
- Option 4: Entries with Links
- Option 5: Entries with External Panels
- Option 6: Compound & Atomic Statements

Option 1 – Sections & Entries

- Panels defined using Sections
- Tests defined using Entries
- Panel-level information defined in a separate Entry
- Pros
  - No need to change existing reference model
  - Query path can be consistent (see below)
- Cons
  - Sections are not intended to represent semantics, and this approach does overload sections with semantics
  - Panel information entry will need to be distinguished from Test entries.
  - Need either copy the context into each test or ensure that we can execute a derivation rule to ensure that the query path can remain consistent

Option 1 – Sections & Entries

ENTRY: **Hematocrit Result**

- ELEMENT: **Information Subjct: 7549**
- ELEMENT: **Date: 27th June 2013**
- ELEMENT: **Test Name: |Hematocrit|**
- ELEMENT: **Result Value: 42%**
- ELEMENT: **Interpretation: |Normal|**

Q: List the Date and Result of all Hematocrit Tests for Information Subject 7549.

**: Derived using a rule

SECTION: **Complete Blood Count**

- ENTRY: **Panel Information**
  - ELEMENT: **Information Subjct: 7549**
  - ELEMENT: **Date: 27th June 2013**
  - ELEMENT: **Panel Interpretation: …**
- ENTRY: **Hematocrit Result:**
  - ELEMENTS: **Info. Subj.** / Date ****
  - ELEMENT: **Test Name: |Hematocrit|**
  - ELEMENT: **Result Value: 42%**
  - ELEMENT: **Interpretation: |Normal|**
- ENTRY: **Hemoglobin Result:**
  - ELEMENTS: **Info. Subj.** / Date ****
  - ELEMENT: **Test Name:|Hemoglobin|**
  - ELEMENT: **Result Value: 14.2 g/dL**
  - ELEMENT: **Interpretation: |Normal|**

Option 2 – Entries & Clusters

- Panels defined using Entries
- Tests defined using Clusters
- Pros
  - X
- Cons
  - X

Option 2a – Entries & Clusters

ENTRY: **Hematocrit Result**

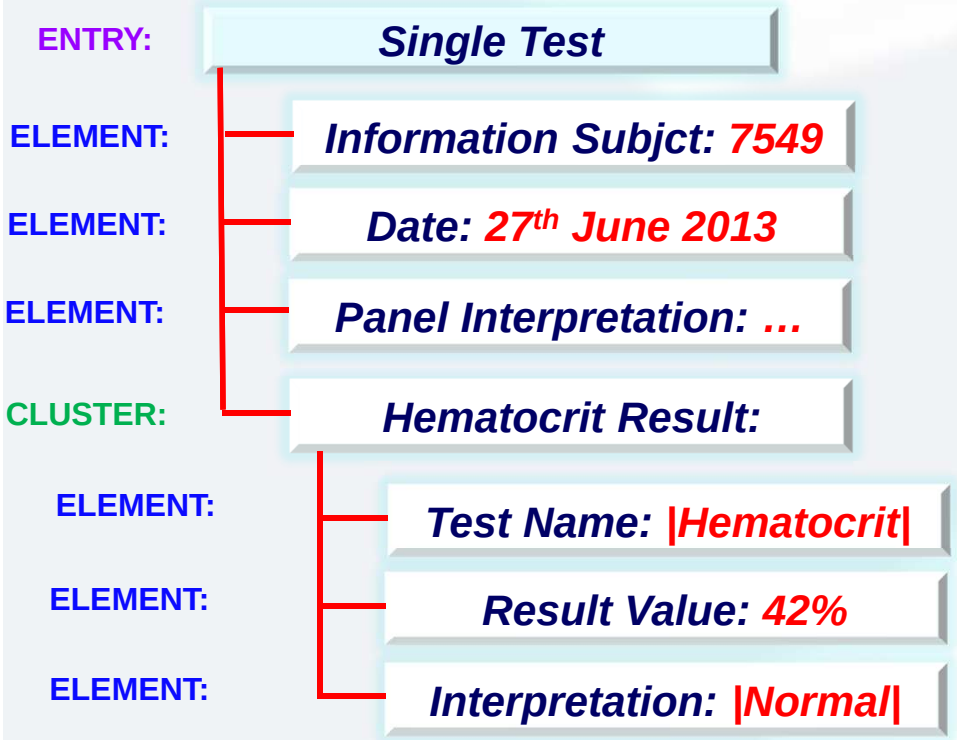
- ELEMENT: Information Subjct: 7549
- ELEMENT: Date: 27th June 2013
- ELEMENT: Test Name: |Hematocrit|
- ELEMENT: Result Value: 42%
- ELEMENT: Interpretation: |Normal|

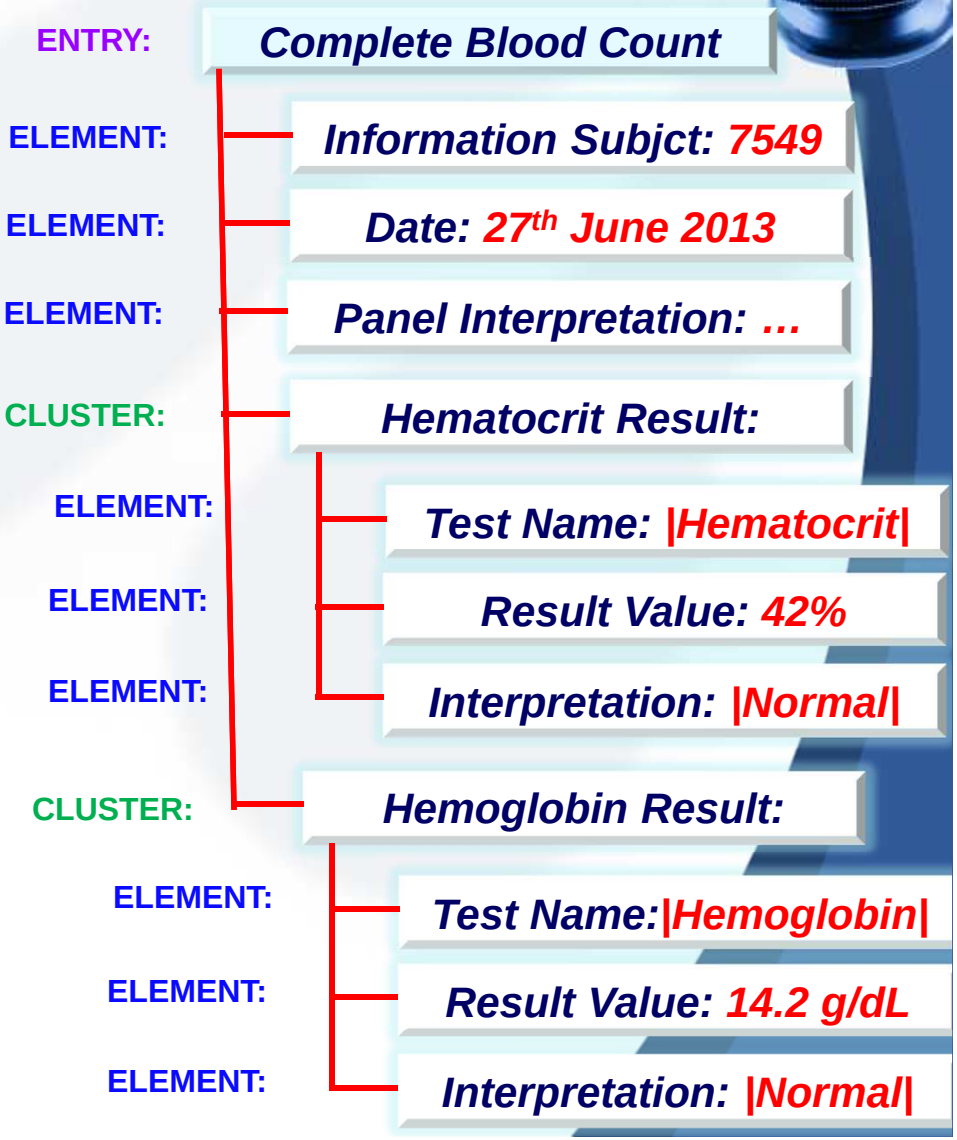
Q: List the Date and Result of all Hematocrit Tests for Information Subject 7549.

ENTRY: **Complete Blood Count**

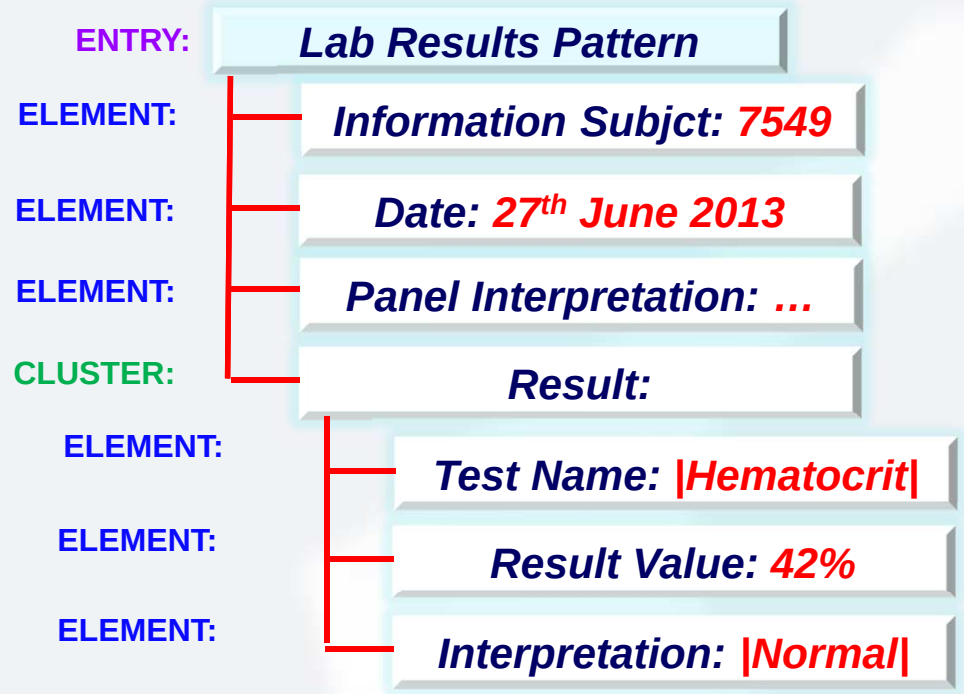
- ELEMENT: Information Subjct: 7549
- ELEMENT: Date: 27th June 2013
- ELEMENT: Panel Interpretation: …
- CLUSTER: Hematocrit Result:
  - ELEMENT: Test Name: |Hematocrit|
  - ELEMENT: Result Value: 42%
  - ELEMENT: Interpretation: |Normal|
- CLUSTER: Hemoglobin Result:
  - ELEMENT: Test Name:|Hemoglobin|
  - ELEMENT: Result Value: 14.2 g/dL
  - ELEMENT: Interpretation: |Normal|

Option 2b – Entries & Clusters





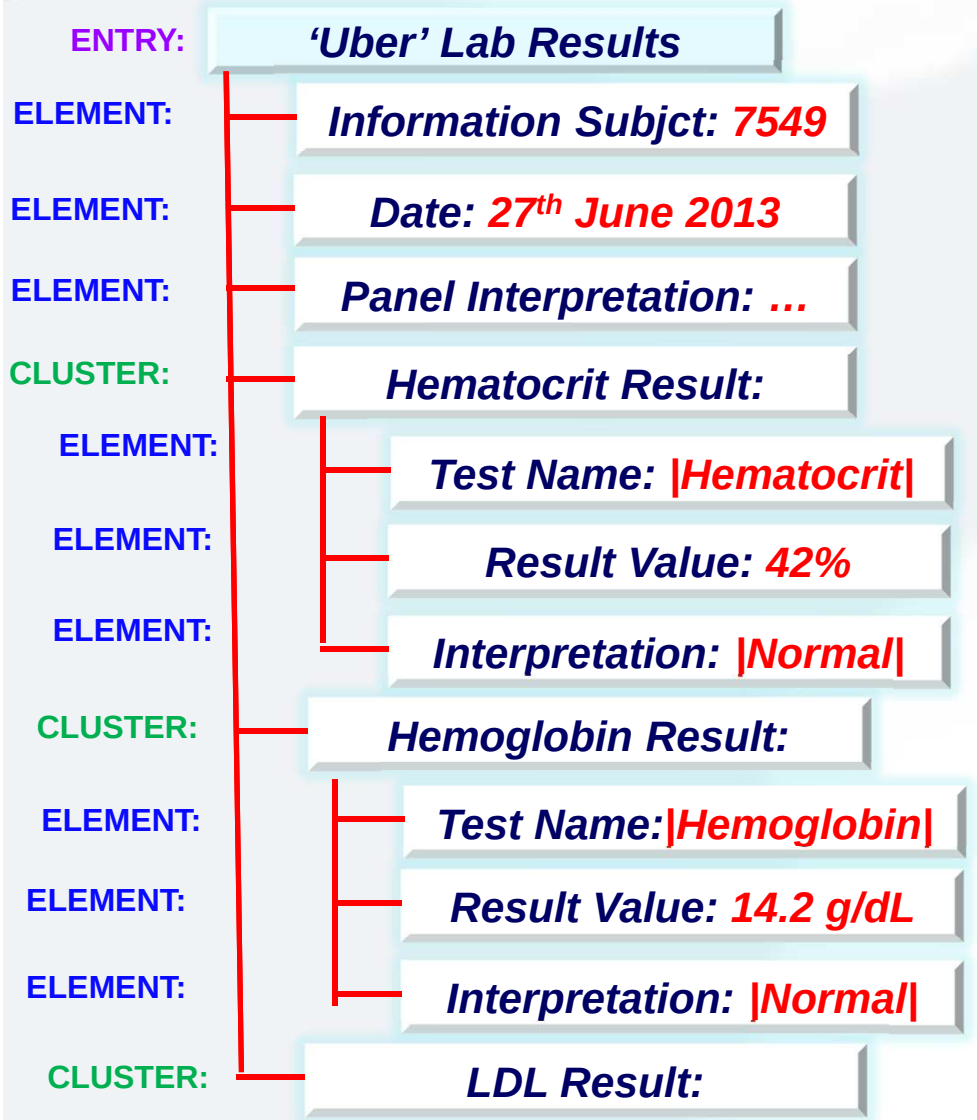
Option 2b – Using Lab Results Pattern

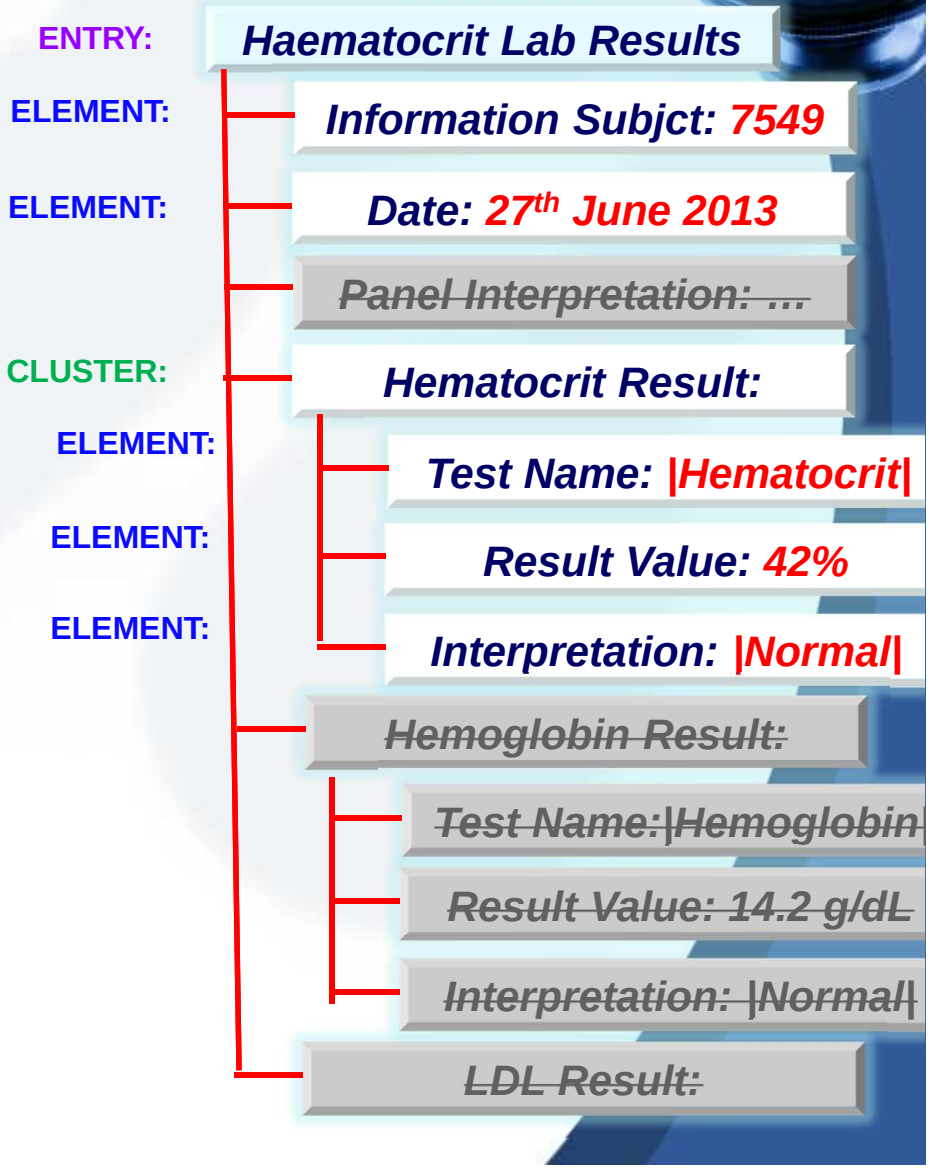


Option 3 – Templated ‘Uber Model’

- Same as Option 2 (Entries & Clusters) – except:
- One Lab Results ‘Uber Model’ is defined, which contains every possible test
- Each Panel is defined as a template (or constraint) on the ‘Uber Model’)
- Pros
  - X
- Cons
  - Doesn’t identify smallest piece of queryable information

Option 3 – Templated ‘Uber Model’

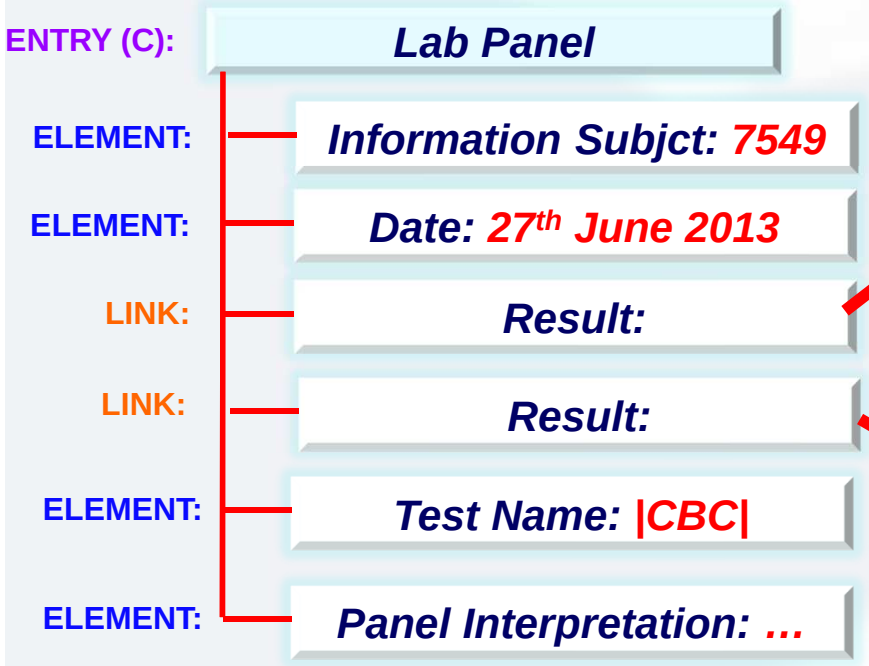


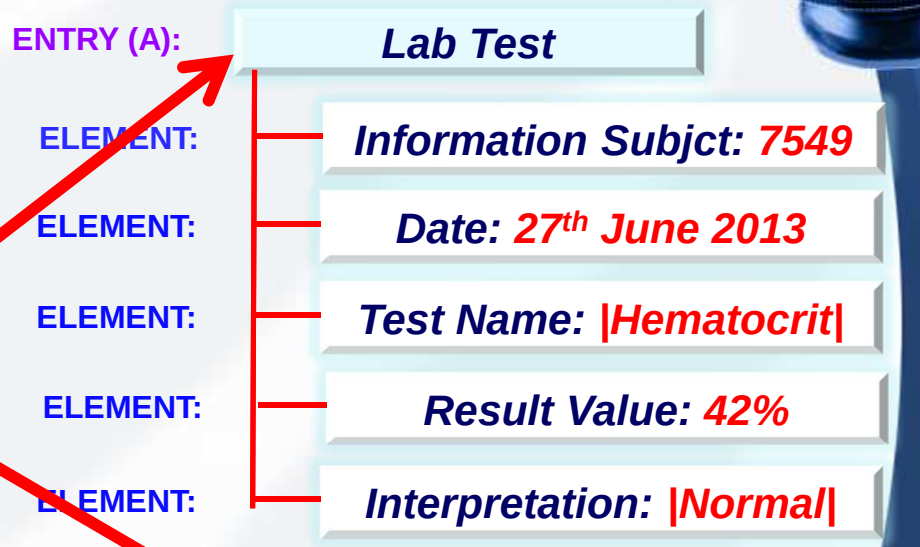


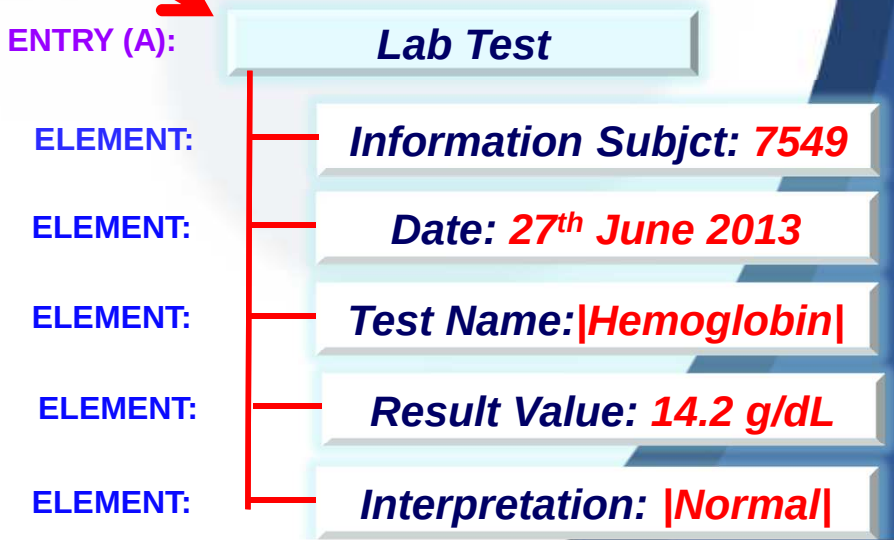
Option 4 – Entries With Links

- Panels defined using Entries
- Tests defined using Entries
- Panel entry includes links to test entries
- Pros
  - No changes to the reference model
  - Query paths are consistent
  - Tests can stand independently with own context
  - Allows arbitrary levels of groupings
- Cons/Implications
  - Requires queries to navigate links and understand the semantics of the links
  - Need to repeat information in each test entry
  - Are reverse links also required?

Option 4 – Entries With Links





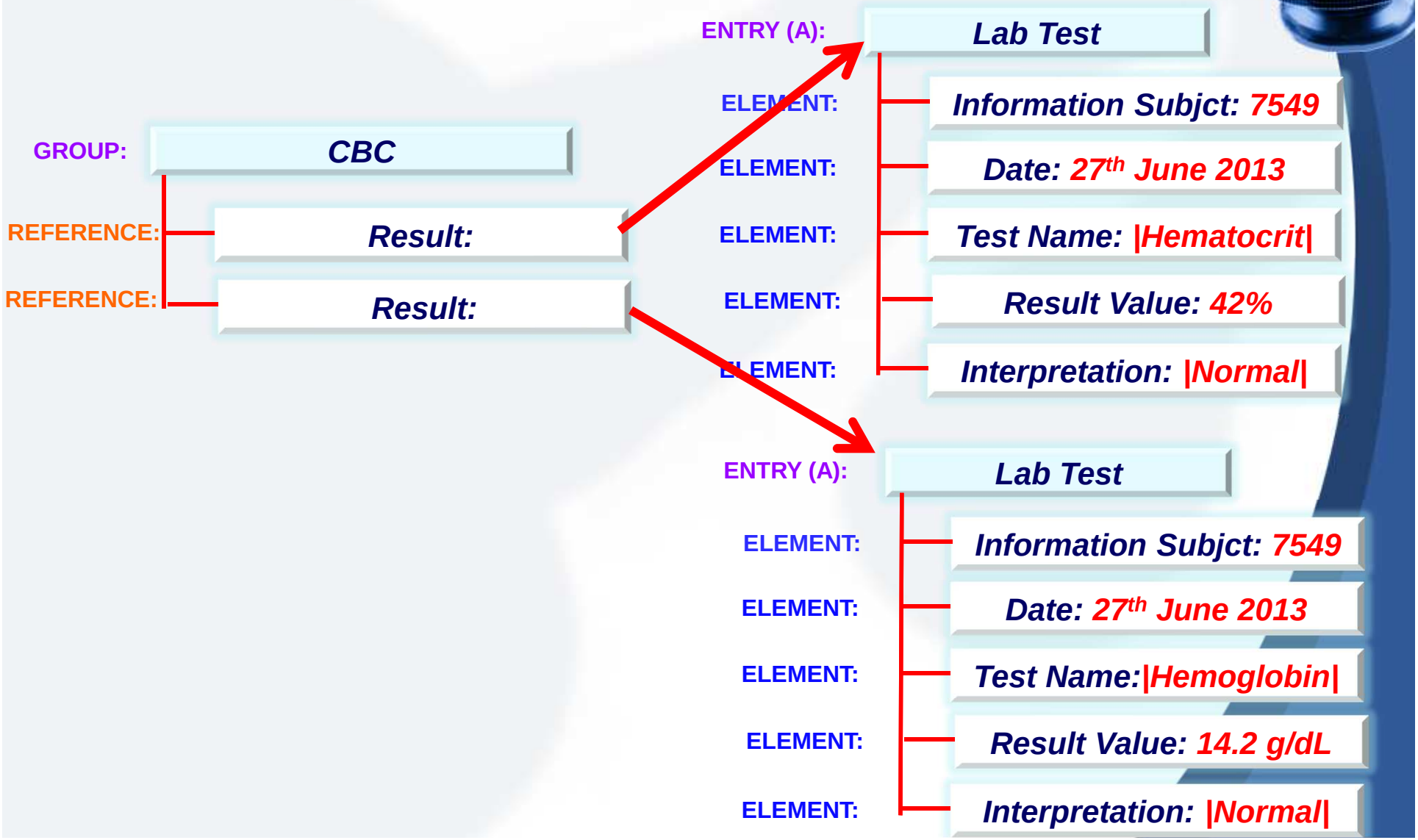


Q: List the Date and Result of all Hematocrit Tests for Information Subject 7549.

Option 5 – Entries With External Panels

- Same as Option 4 – except:
- Panels defined in an external database, as a set of references to test entries
- Pros
  - X
- Cons
  - Knowledge is split between the model and the external resource. Knowledge framework is not consistent.

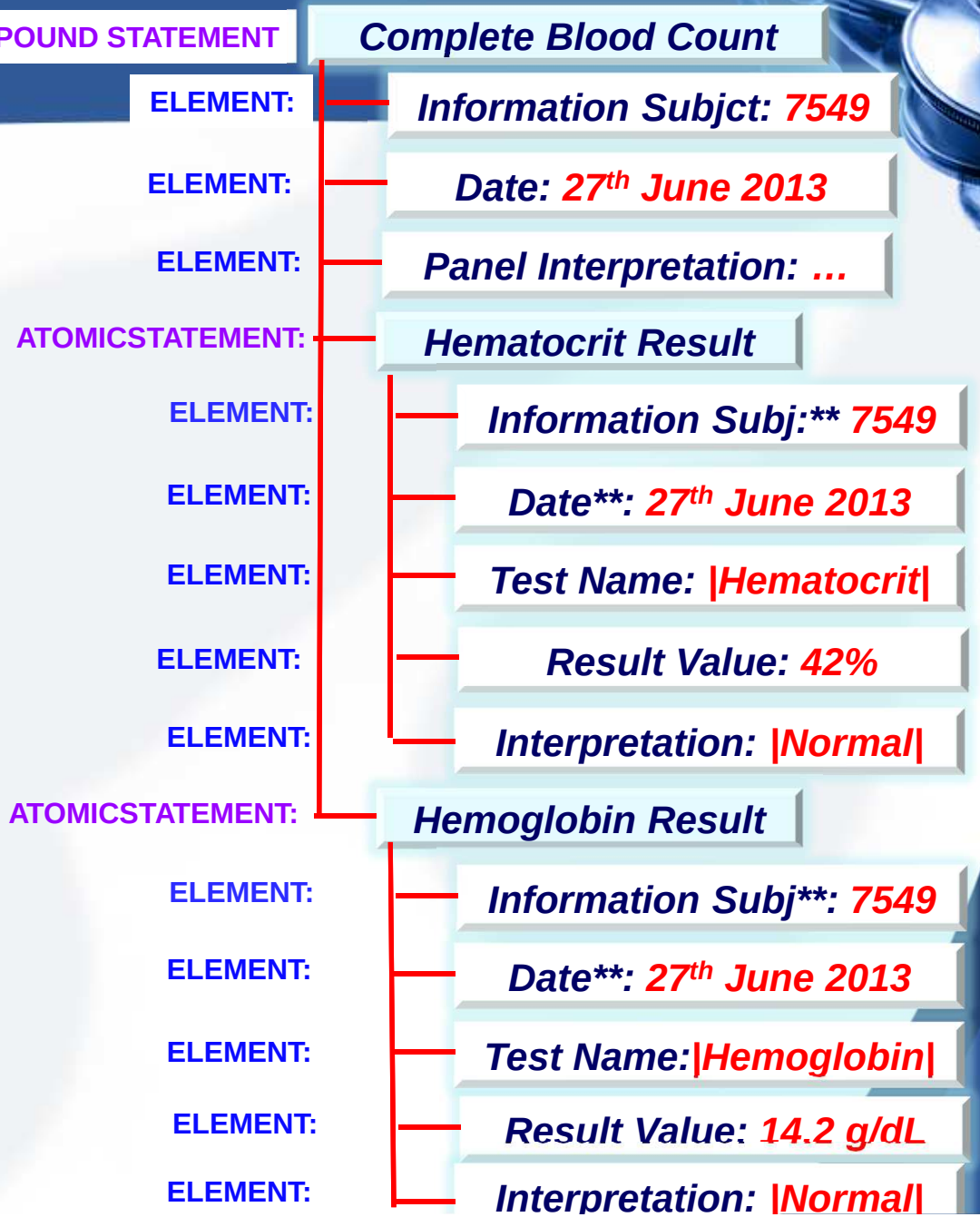
Option 5 – Entries With External Panels



Option 6 – Compound & Atomic Statements

- Replace Entry with 2 new reference model classes:
  - Compound Statements
    - Used for panels, and may contain data elements, compound statements or atomic statements; Contains shared context.
  - Atomic Statement
    - Used for individual tests, and represent indivisible unit of information about the patient; All context is self-contained or derivable.
- Pros
  - Consistent query paths
  - Identifies indivisible units of information
  - Allows arbitrary levels of nesting
  - Allows context derivation rules to be applied
- Cons

Option 6 – Compound & Atomic Statements



**: Derived