



CIMI and SOLOR

Content Binding

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Motivations

- FHIR profiles from CIMI detailed clinical models
- Profiles need to consistently bind to
 - SNOMED
 - LOINC
 - RxNorm
- Don't reinvent the wheel
- Collaborate where possible

Objectives of the Meeting

- Understand the CIMI SOLOR approach
- Present the CIMI SOLOR Vital Signs work
- Identify areas of collaboration

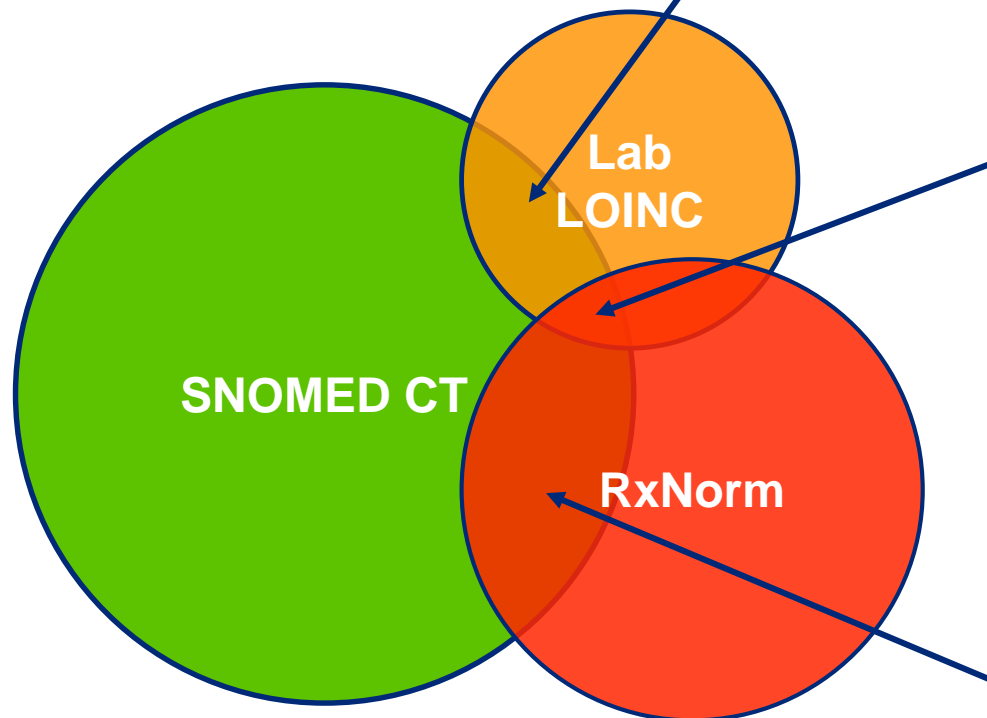
CIMI/SOLOR Background

Why SOLOR?

- For interoperability we need
 - SNOMED CT
 - LOINC
 - RxNorm



The overlaps



LOINC: Gentamicin is a component of laboratory tests

SNOMED: Gentamicin is a component of laboratory tests

LOINC: Gentamicin is a component

SNOMED: Gentamicin is a substance

RxNorm: Gentamicin is an ingredient

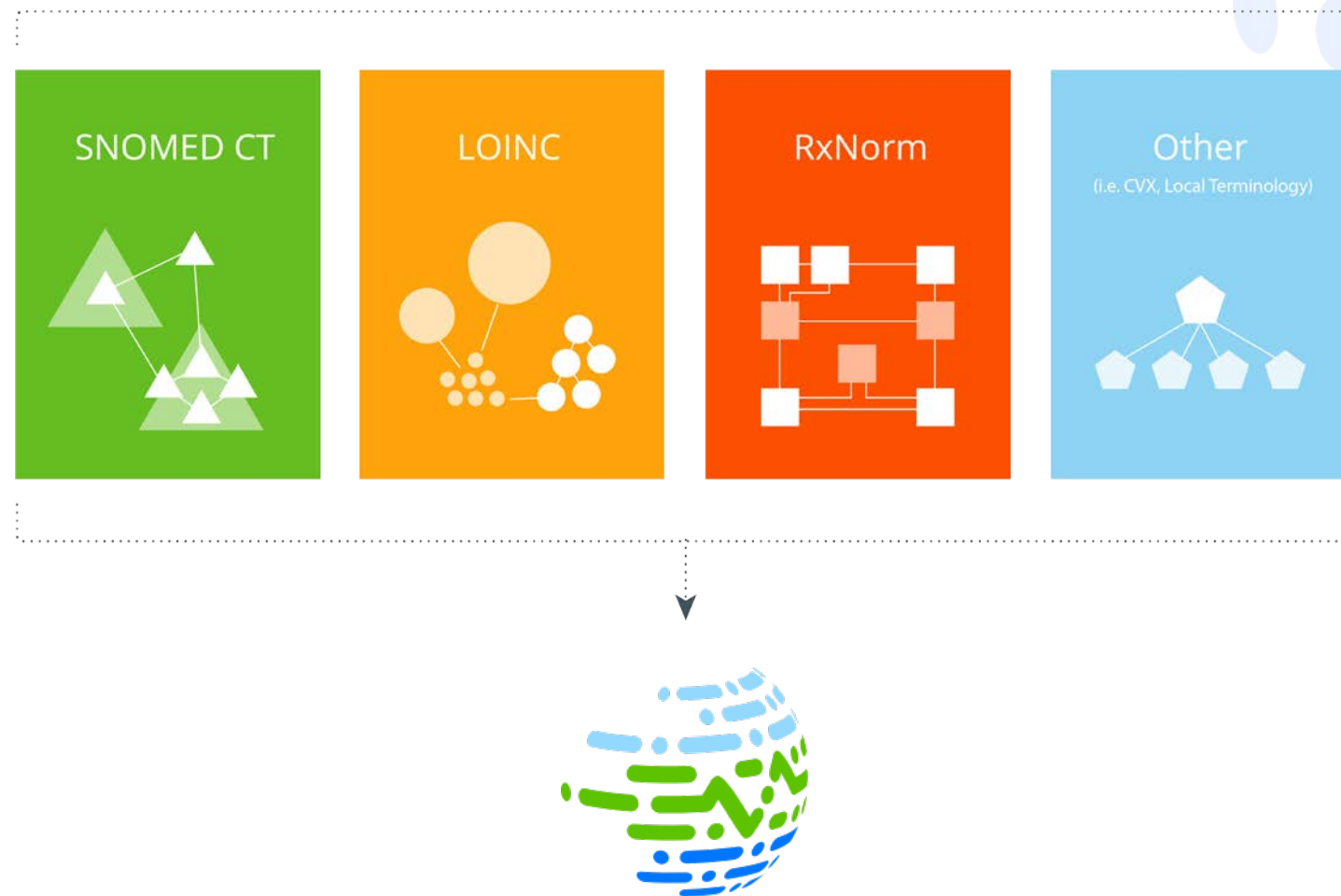
SNOMED: Gentamicin is a PRODUCT

SNOMED: Gentamicin 0.3% preservative-free eye drops

RxNorm: Gentamicin sulfate 0.3% Ophthalmic Solution

RxNorm: Gentamicin is a PRODUCT

SOLOR Construction



Clinical Information Modeling Initiative (CIMI)

- CIMI is an HL7 Work Group producing detailed clinical information models to enable interoperability of health care information systems
- CIMI conceived during a “Fresh Look” session at an HL7 meeting in 2011
- CIMI models are free for use for all purposes
- See <http://www.hl7.org/Special/Committees/cimi/index.cfm> for more details

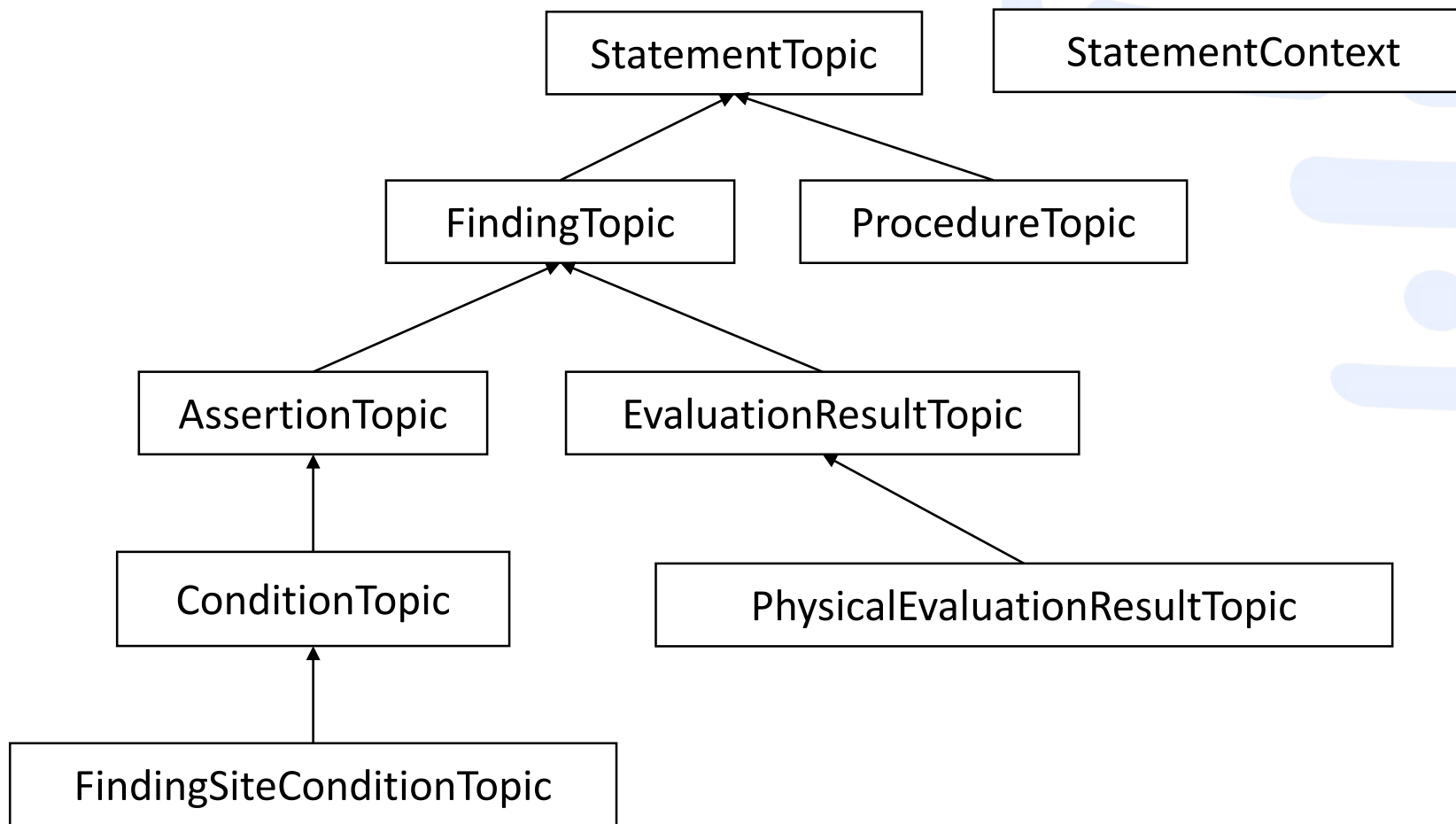
End goal: Executable knowledge sharing

- Overcome the “curly braces problem”
- Ability to share decreases cost of implementation and deployment
- Ability to share *executable* knowledge reduces risk of translation/mapping/reimplementation errors

Real enablement of patient safety at scale is when we can share executable knowledge...

— Stan Huff

CIMI Hierarchy



CIMI Terminology Binding Requirements

CIMI Terminology Binding Requirements

- All finalized CIMI Models shall have:
 - Semantic concept binding for each data element in the model
 - A value binding for each node of type CODED_Text
- Reference Terminologies (SNOMED, LOINC, RxNorm)
- CIMI supports isosemantic models

Condition Pattern

ConditionTopic	Attribute	Range
topicCode : Concept [1..1]	246090004 Associated finding (attribute)	<< 404684003 Clinical finding (finding)
description : PlainText [0..1]	New	None
multimedia : Multimedia [0..*]	New	Under development
interpretation : Concept [0..*]	363713009 Has interpretation (attribute)	
severity : Concept [0..1]	246112005 Severity (attribute)	<< 272141005 Severities (qualifier value)
clinicalCourse : Concept [0..1]	263502005 Clinical course (attribute)	<< 288524001 Courses (qualifier value)
occurrence : Concept [0..1]	272120004 Occurrences (qualifier value)	<<272120004 Occurrences (qualifier value)
diseasePhase : Concept [0..1]	278174000 Disease phase (attribute)	
associatedSignAndSymptom : Concept [0..*]	New	Under development
alleviatingFactor : Concept [0..*]	New	
exacerbatingFactor : Concept [0..*]	New	
clinicalStatus : Concept [0..1]	263493007 Clinical status (attribute)	
associatedEntity : EntityAssociationNOS [0..1]	47429007 Associated with (attribute)	Under development
dueTo : DueTo [0..*]	42752001 Due to (attribute)	
before : TemporallyBefore [0..*]	288556008 Before (attribute)	
after : TemporallyAfter [0..*]	255234002 After (attribute)	
...		

Constraining CIMI Model Patterns

- Based on one or more predefined reference model patterns and top level archetypes
- Value set HAS to be constrained from top level data element range
- Subtype
 - Attribute binding can stay at the higher level attribute –or–
 - Attribute can be further refined as a specialization

SOLOR Content

Vital Sign Refsets

RefSet Name	Version	Date	Purpose
Blood Pressure Device Cuff Size Refset	v .1	TBD	This reference set contains concepts used to result the size of a blood pressure cuff used during a blood pressure measurement, referencing the SNOMED Code 722471002 "Size of blood pressure cuff (observable entity)" and the LOINC term "Blood pressure device Cuff size" 8358-4.
Blood Pressure Device Type Refset	v .1	TBD	This reference set contains concepts used to result the size of a blood pressure cuff used during a blood pressure measurement, referencing the SNOMED Code 722471002 "Size of blood pressure cuff (observable entity)" and the LOINC term "Blood pressure device Cuff size" 8358-4.
Blood Pressure Measurement Site Refset	v .1	TBD	This reference set contains values used to result the body location where a blood pressure was measured, referencing the LOINC term "Blood pressure measurement site", 41904-4.
Blood Pressure Method Refset	v .1	TBD	This reference set contains concepts used to result the method used for a blood pressure measurement, referencing the SNOMED Code 2291000205103 "Blood pressure method (observable entity)" and the LOINC term "Blood pressure method" 8357-6.
Body Position Refset	v .1	TBD	This reference set contains concepts used to result the patient's body position, referencing the SNOMED Code 397155001 Body position (observable entity) and the LOINC term "Body position with respect to gravity" 8326-1.
Body Temperature Device Type Refset	v .1	TBD	This reference set contains concepts used to result the type of device used to measure a body temperature, referencing the LOINC term "Type of Body temperature device" 8326-1.
Clothing Worn During Measure Refset	v .1	TBD	This reference set contains concepts used to result the amount of clothing worn during the measure, referencing the SNOMED Code 248159006 "State of dress (observable entity)" and the LOINC term "Clothing worn during measure" 8352-7.
Heart Rate Device Type Refset	v .1	TBD	This reference set contains concepts used to result the type of device used to measure a heart rate, referencing the SNOMED Code 1511000205100 Heart rate device type (observable entity) and the LOINC term "Type of Heart rate device" 8887-2.

Blood pressure device cuff size reference set (foundation metadata concept)



SCTID: 1481000205107 , Primitive , Active , Published

Term	Acceptability (US)	Published
F ☆ Blood pressure device cuff size reference set (foundation metadata concept)	Preferred	Published R 0
S ★ Blood pressure device cuff size reference set	Preferred	Published R 0
D ★ This reference set contains concepts used to result the size of a blood pressure cuff used during a blood pressure measurement, referencing the SNOMED Code 722471002 "Size of blood pressure cuff (observable entity)" and the LOINC term "Blood pressure device Cuff size" 8358-4.	Preferred	Published R 0

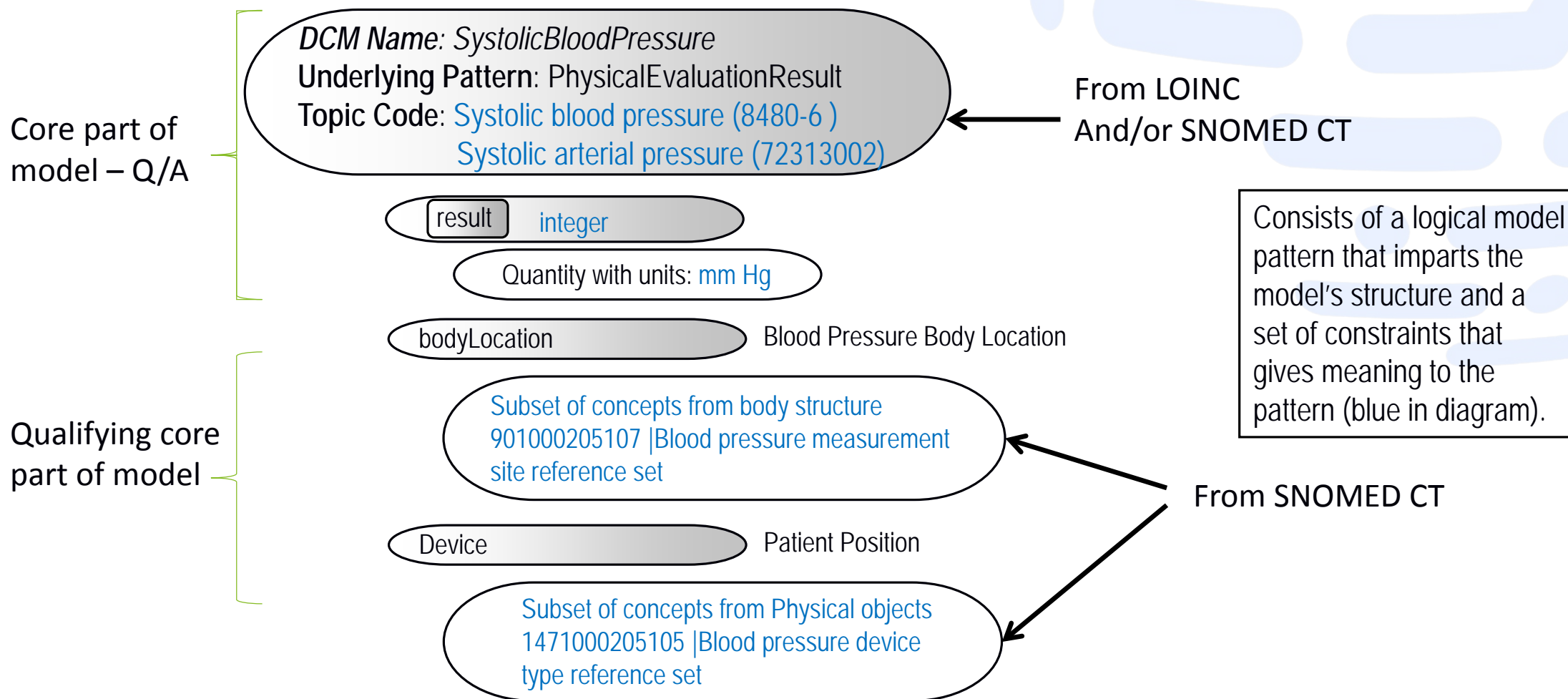
Type	Destination	Group	CharType	Published
Is a (attribute)	Simple type reference set (foundation metadata concept)	0	Stated	Published

Blood Pressure device cuff size reference set

Term	Concept ID
● Blood pressure cuff, adult size (physical object)	720737000
● Blood pressure cuff, adult size large (physical object)	720738005
● Blood pressure cuff, adult size small (physical object)	720739002
● Blood pressure cuff, adult thigh type (physical object)	720740000
● Blood pressure cuff, ankle type (physical object)	8741000205104
● Blood pressure cuff, extra large adult thigh cuff (physical object)	8731000205109
● Blood pressure cuff, infant size (physical object)	8861000205108
● Blood pressure cuff, neonatal size 1 (physical object)	8841000205107
● Blood pressure cuff, neonatal size 2 (physical object)	8851000205105
● Blood pressure cuff, neonatal size 3 (physical object)	8821000205104
● Blood pressure cuff, neonatal size 4 (physical object)	8811000205106
● Blood pressure cuff, neonatal size 5 (physical object)	8801000205109
● Blood pressure cuff, pediatric size (physical object)	720736009

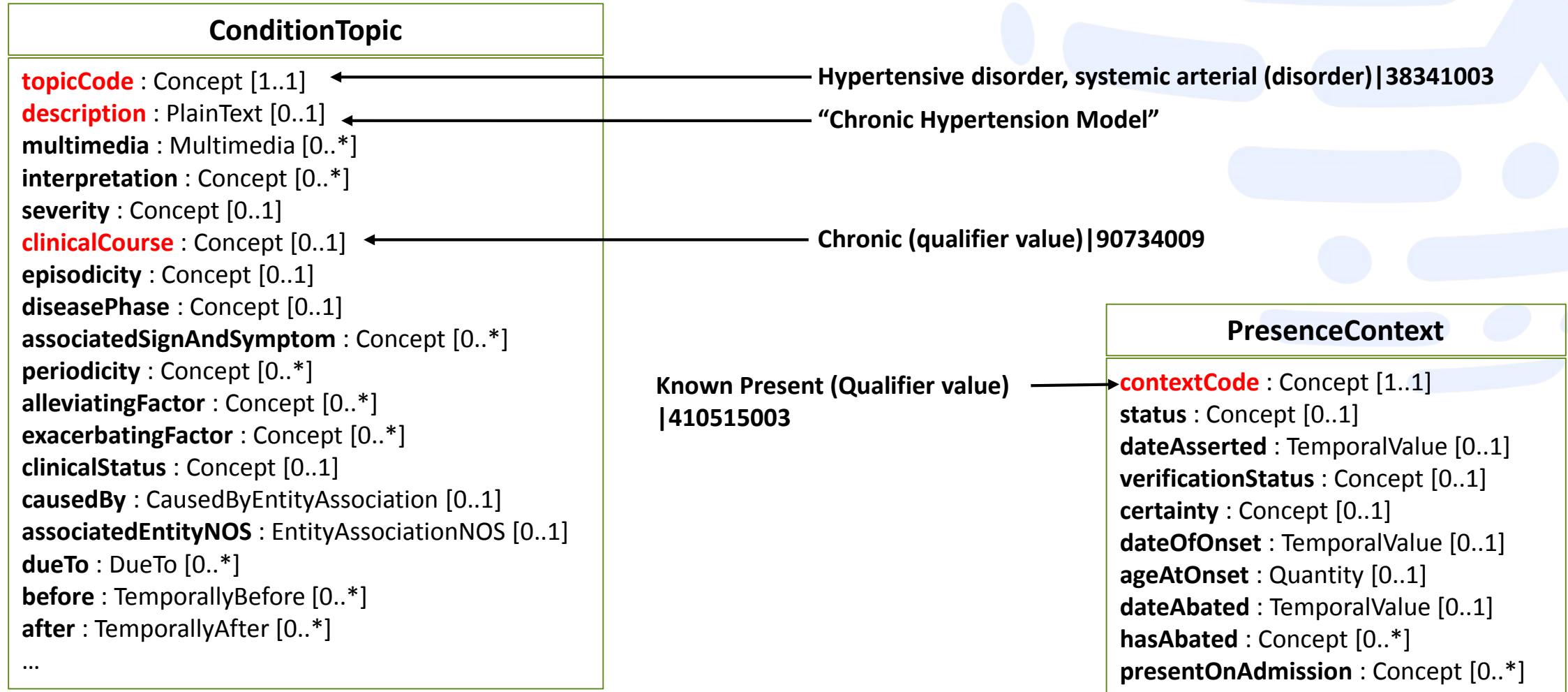
Model Examples

Systolic Blood Pressure



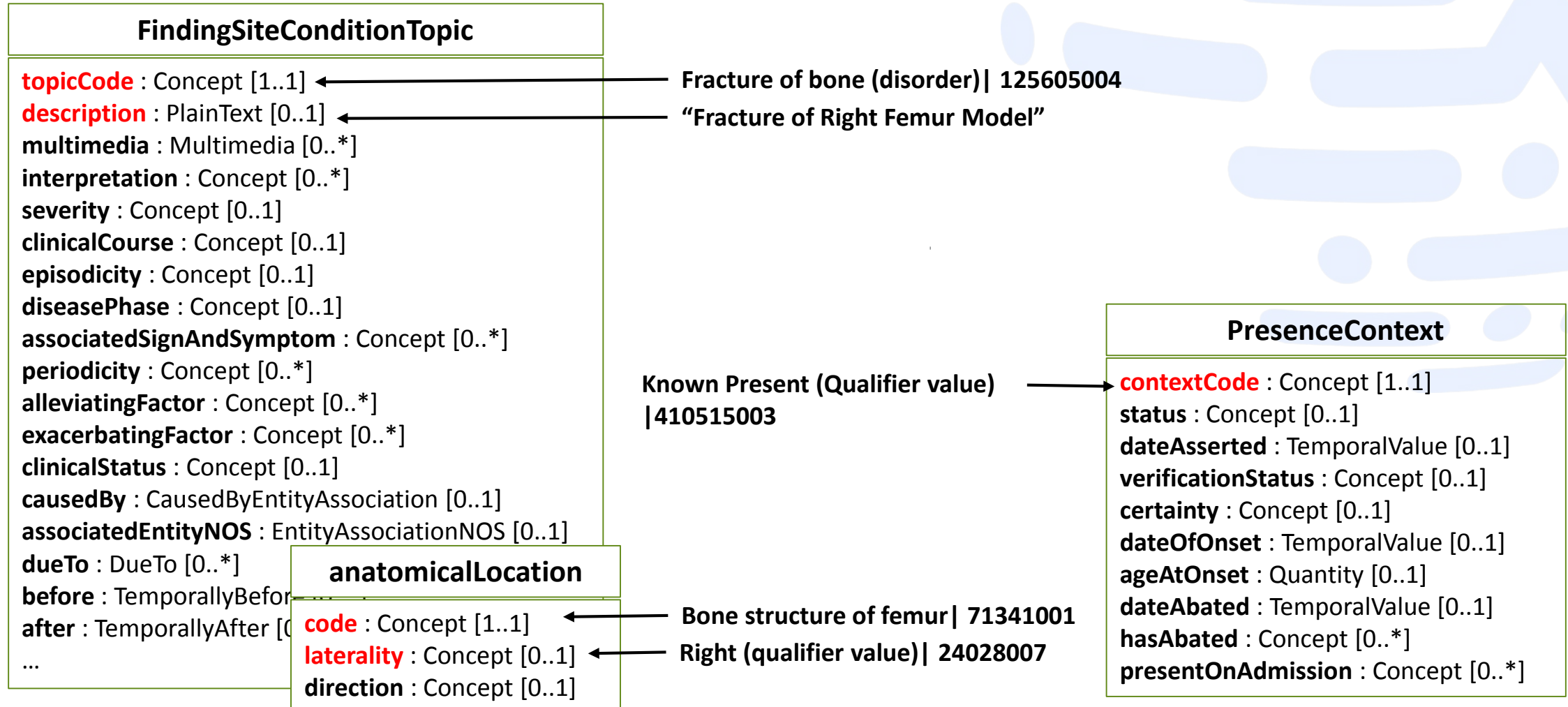
Condition

“Chronic Hypertension”



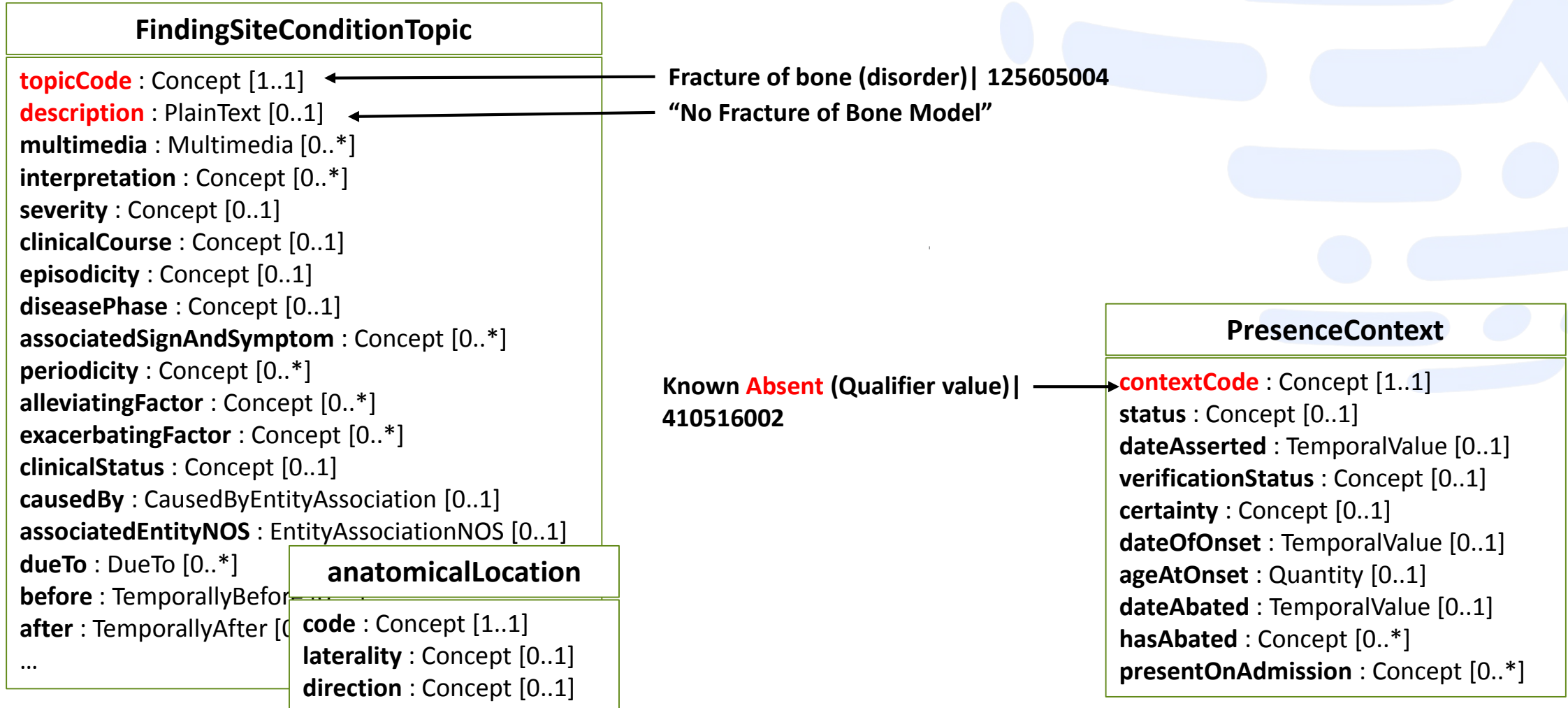
Condition Exercise

“Fractured Right Femur”



Condition

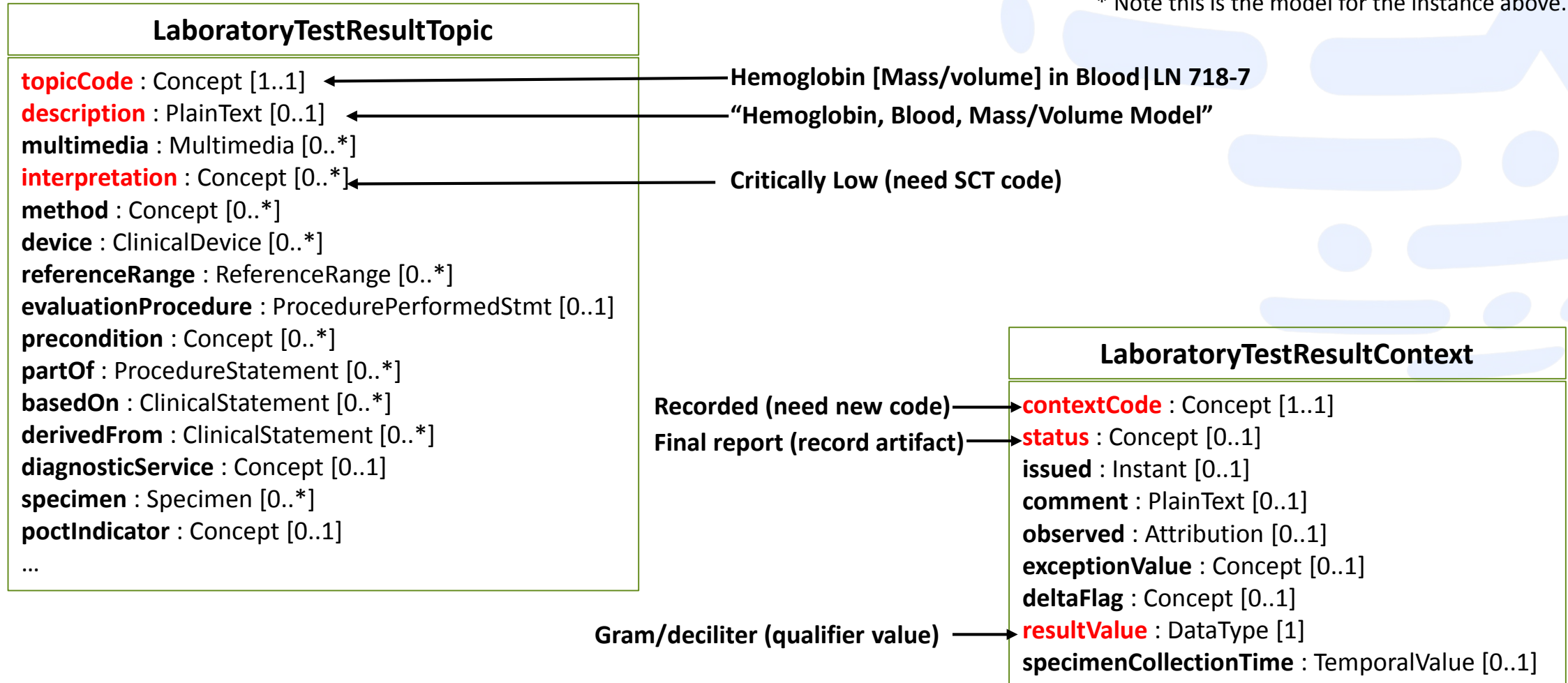
“No Bone Fractures”



Lab Evaluation Result Exercise

“Blood Hemoglobin of 6.1 g/dl is Critically Low”

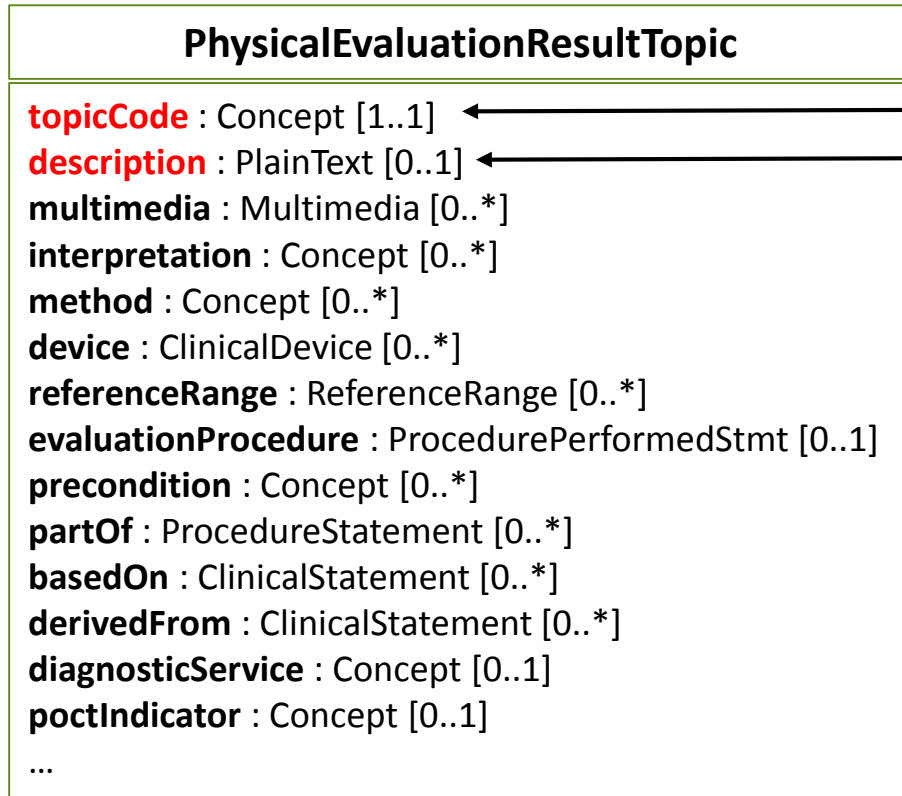
* Note this is the model for the instance above.



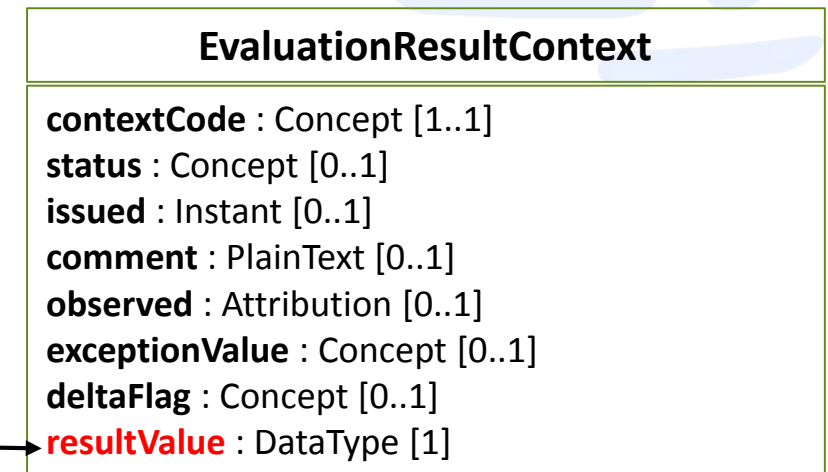
Evaluation Result Exercise

“Patient’s skin turgor decreased”

* Only new constraints are shown in diagrams



Skin Turgor | LNC 39109-4
“Skin Turgor Model”



Decreased skin turgor (finding) | SCT 425244000

SOLOR Information

- SOLOR project information on HSPC Confluence
 - <https://healthservices.atlassian.net/wiki/spaces/SOLOR/overview>
- Sources for Documentation and Tools
 - KOMET – <https://github.com/OSEHRA/komet>
 - ISAAC – <https://github.com/OSEHRA/ISAAC>
- SOLOR JIRAs
 - <https://healthservices.atlassian.net/projects/SOL/summary>
 - <https://healthservices.atlassian.net/projects/SIK/summary>
- SOLOR Website
 - <http://solor.io>
 - <http://solor.io/blog/>
- SOLOR Viewer App and User Guide
 - Navigate to **Learn More** section of <http://solor.io>



Q & A