



HL7 Domain Analysis Model:
Patient Centered Care Team,
Release 1

September 2018

HL7 Comment-Only Ballot

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International Classification of Diseases (ICD) codes	World Health Organization (WHO)
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About Learning Health System

The ideal future state for health and care that has become the shared vision of many is usually referred to as the Learning Health System. The HL7 Learning Health Systems Workgroup was established to work towards creating standards to enable this vision by taking a system level view of healthcare. The foundational concept of a learning health system is a system in which information and knowledge are shared across the system and are used to create a system of continuous process improvement. The goal of such a system is to continually improve the health and health outcomes of every individual

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Table of Contents

HL7 Domain Analysis Model: Patient Centered Care Team, Release 1	1
About Learning Health System	3
Editors and Contributors	3
Table of Contents	4
Care Team	11
Introduction	11
Scenario	12
Scenario 1	12
Scenario 2	12
Scenario 3	12
Scenario 4	12
Scope	13
In Scope	13
Out of Scope	13
Conceptual Model - Fundamental Concepts and Relationships	14
Core Concepts	14
Logical Model	16
Entity and Role - Overview	16
Class EntityOrRole	16
Attribute Detail	17
identifier	17
Class Role	17
Attribute Detail	18
actor	18
type	18
Class Entity	18
Attribute Detail	18
description	18
image	19
Care Team Overview	20
Class RoleBasedTeam	21
Attribute Detail	21
category	21
managingOrganization	21

name	21
reason	22
status	22
teamMemberRole	22
timing	22
Class PatientCentricCareTeam	22
Attribute Detail	23
adheres	23
context	23
manages	23
note	23
subject	24
Class CarePlan	24
Role - Overview	24
Class HealthCareRole	26
Attribute Detail	26
confidentialityLevel	26
preference	26
status	26
validityPeriod	27
Class HealthCareConsumerRole	27
Attribute Detail	27
associatedHealthCareProvider	27
contact	27
importance	28
managingOrganization	28
organDonorType	28
Class NonCredentialedCareGiver	28
Attribute Detail	29
skills	29
Class HealthCareProviderRole	29
Attribute Detail	29
affiliation	29
fieldOfPractice	29
providerClassification	30
Class HealthCareProviderIndividualRole	30

Attribute Detail	30
qualification	30
Class HealthCareProviderOrganizationRole	30
Class NonCredentialedCareGiver	31
Attribute Detail	31
skills	31
Foundational Entities	32
Class Organization	34
Attribute Detail	34
address	34
departmentOrUnit	34
electronicContact	34
industry	35
organizationName	35
status	35
validityPeriod	35
Class Person	35
Attribute Detail	36
address	36
administrativeGender	36
birth	36
death	36
electronicContact	37
maritalStatus	37
personName	37
Class DetailedPerson	37
Attribute Detail	38
citizenship	38
disability	38
educationLevel	38
ethnicity	38
language	39
occupation	39
qualification	39
race	39
religion	39
residency	40

Class Device	40
Attribute Detail	40
expirationDate	40
key	41
lotNumber	41
manufactureDate	41
manufacturer	41
model	41
url	42
version	42
Class Location	42
Attribute Detail	42
condition	43
electronicContact	43
locationName	43
purpose	43
status	43
type	44
validityPeriod	44
Class GeographicalLocation	44
Attribute Detail	44
address	44
directions	45
gpsLocation	45
Value Set and Vocabularies	46
Care Team Category/Type valueset	46
Care Team Role Function Starter Valueset	46
Appendix 1 - CIMI Primitive and Core Data Types	48
CIMI Primitive Types	48
Class Any	48
Class List	49
Class TerminologyCode	49
Attribute Detail	49
codeString	49
terminologyId	49
terminologyVersion	50
uri	50

CIMI Core Data Types	51
Class DataType	51
Class CodedText	52
Attribute Detail	52
concept	52
mapping	52
Class Concept	53
Attribute Detail	53
code	53
display	53
isExpression	53
Class Decimal	54
Attribute Detail	54
value	54
Class EmbeddedContent	54
Class GpsLocation	55
Attribute Detail	55
altitude	55
latitude	55
longitude	56
Class Instant	56
Class IntervalValue	56
Attribute Detail	57
lower	57
lowerIncluded	57
lowerUnbounded	57
upper	57
upperIncluded	58
upperUnbounded	58
Class Multimedia	58
Attribute Detail	58
alternateText	58
data	59
mediaType	59
resourceIdentifier	59
Class OrderedValue	59

Class NumericalValue	60
Attribute Detail	60
precision	60
Class Decimal	60
Class IntegerType	61
Attribute Detail	61
value	61
Class UnsignedInteger	61
Class PositiveInteger	62
Attribute Detail	62
units	62
value	62
Class Quantity	63
Class Duration	63
Attribute Detail	63
durationText	64
Class OrdinalConcept	64
Attribute Detail	64
positionInSet	64
Class ParsableContent	65
Attribute Detail	65
formalism	65
value	65
Class PlainText	65
Class Ratio	66
Attribute Detail	66
denominator	66
numerator	66
Class TemporalValue	67
Attribute Detail	67
value	67
Class Date	67
Class Time	68
Class DateTime	68

Class Instant	69
Class TermMapping	69
Attribute Detail	69
match	69
purpose	70
target	70
Class Text	70
Attribute Detail	71
language	71
value	71
Class UriType	71
Attribute Detail	72
value	72

Care Team

Introduction

Individuals with complex health disorders and those with multiple chronic conditions typically have caregivers that include multiple healthcare professionals, community caregivers and support services, and family members. Some of these caregivers may be organized as teams, but often there are individuals who act independently and teams that are not associated, nor even aware of the existence of other caregivers caring for the same individual. This fragmented care for individuals is inherently sub-optimal with resultant inefficiencies and safety issues. There are in practice attempts to identify caregivers and organize care for an individual by care managers who are professionals or family members. This process is most often paper based, or sometimes supported by care management platforms which are proprietary and usually supported in only one organization where the patient receives care.

The Care Team Domain Analysis Model (DAM) has been undertaken to create a model that captures the roles and relationships of the unique group of individuals who provide care for a single patient. Although this group of individuals may not have a business relationship, nor any relationship other than their participation in the care of the same individual, they are for the purposes of this DAM considered to be a team.

It is inherently obvious that in order to improve the process of care and the outcomes of care for an individual or a population of individuals, it is necessary to document and codify the roles of each individual's care team, the relationship of those individuals to the patient, and to each other. The Care Team DAM is intended to enable creation of standards that will improve care and outcomes by creating an interoperable, computable representation of a patient centered care team. This will first allow the members of a care team, including the patient, to identify and communicate with others on the care team. The vision of improving care coordination and the process of care can only be achieved with such a representation of the care team in place. Care planning and care management are tied to a shareable representation of each care team and the ultimate goal of a learning health system is also dependent on being able to measure the performance of each care team as a part of the system.

This first comment only ballot is focused on the core concepts of roles and relationships for care team members to a particular patient who is the subject and a member of the care team. This will include the concept of a group of individuals or another team fulfilling a role on the care team. Other attributes of care team members which have been identified in considering a broad range of use cases, such as communication endpoints, consent permissions, back up coverage, and roles in creating and managing care plans will be addressed in subsequent ballot cycles.

This ballot has two components: a requirements definition and a logical model proposed to support these requirements.

Scenario

The domain analysis models presented in this for-comment submission are informed by the following scenarios, which is based on the [Betsy Johnson Storyboard](#).

Scenario 1

Betsy Johnson, a 60 year-old widow and retired teacher lives in Springfield, IL. She lives a few streets from her daughter (Daisy), who is her caregiver, assisting with her healthcare and legal needs.

Betsy has a son, Sunny, who lives in Orlando, Florida. Betsy stays with her son for a couple of months each winter, during which her son replaces his sister as Betsy's caregiver.

Her significant chronic health concerns include type 2 diabetes, congestive heart failure, chronic kidney disease, chronic anxiety, and diabetic retinopathy.

Scenario 2

Betsy has Type 2 Diabetes diagnosed 20 years ago, dyslipidemia and peripheral vascular disease diagnosed 4 years ago, congestive heart failure diagnosed 2 years ago, and anxiety diagnosed nearly 1 year ago.

Her medical conditions are managed by her primary care provider, Dr John Carlson of Rose Valley Primary Care. She was referred by Dr Carlson to her dietitian/nutritionist (Maria Gonzales, RD) for education and management of her diet specific to her diabetes, dyslipidemia, and weight issue related to her sedentary lifestyle.

Due to the complexity of her health conditions, a care coordinator from Rose Valley Primary Care, Deborah Smith, is assigned to coordinate and assist in managing Betsy's care.

Scenario 3

Betsy started to develop progressive chronic kidney disease (CKD) about 10 years ago. Her chronic renal condition is continuously managed by a multi-disciplinary nephrology team (functioning as in a whole as a member of the composite care team lead by Dr Carlson). The nephrology team is led by Dr Vice Jones, chief nephrologist of the Nephrology Clinic. Given the complexity of Betsy's condition, the nephrology clinic's care coordinator, Sarah King, is assigned to coordinate the nephrology care and liaise with the care coordinator from Rose Valley Primary Clinic to ensure that management plans and care activities delivered by the nephrology team and the composite team from Rose Valley are integrated and coordinated as much as possible

Scenario 4

Because of her congestive heart failure and diabetic retinopathy resulting in loss of vision, Betsy has significant difficulties in managing her activities of daily living. Deborah Smith, care coordinator from Rose Valley Primary Care initiated two community services to provide the

appropriate level of support to Betsy so that she can continue to live relatively independently at home as she prefers. The two services are meals-on-wheels and home help service

Scope

In Scope

The scope of this submission is to define the fundamental concepts and conceptual relationships for a patient-centric care team and a set of roles and functions involved in the care or management of a subject of healthcare services. The entities that perform the defined roles include the subject himself/herself, professional healthcare provider persons and organizations and/or units (e.g. “Meals-on-Wheels service”, “home help service”) within organizations, and lay caregivers.

In individuals with complex and chronic health conditions, it is common that he/she is cared for by a composite care team which also include other multi-disciplinary care teams (e.g. the nephrology care team in this submission).

Out of Scope

The following are excluded from the scope of this submission:

- Intelligent devices (such as infusion pumps, cardiac pacemaker and implantable cardioversion defibrillator) that generates actionable data and perform AI algorithmic actions
- The functions of holiday coverage or roster-off backup
- Care team workflow management

They may be considered for future submission. Moreover, many of the concepts and relationships highlighted in the patient-centric care team conceptual model will be further elaborated in future submissions. We do welcome, however, any comments that will help us further elaborate these models.

Conceptual Model - Fundamental Concepts and Relationships

This submission focuses on the fundamental concepts surrounding the notion of a patient-centric care team to support existing HL7 modeling efforts such as CIMI and FHIR. It is not intended to be a comprehensive conceptual model of the care team. Its purpose is to better understand such core concepts in light of surfaced requirements prior to elaborating these concepts further. Future submissions shall further build on these core concepts to further refine the Care Team Model based on identified clinical requirements, use cases, and storyboards and shall address alignment to the FHIR Care Team model as well as inform it.

The current model introduces the concept of the patient-centric care team as a role-centric rather than an entity-centric design. Entities such as people, groups of people, organizations, and even other care teams interact with a patient by assuming specific roles in the provision of care to the subject. The HL7 Care Team Conceptual Model is illustrated below. Most attributes have been left out for clarity at this time but are introduced in the logical model that follows.

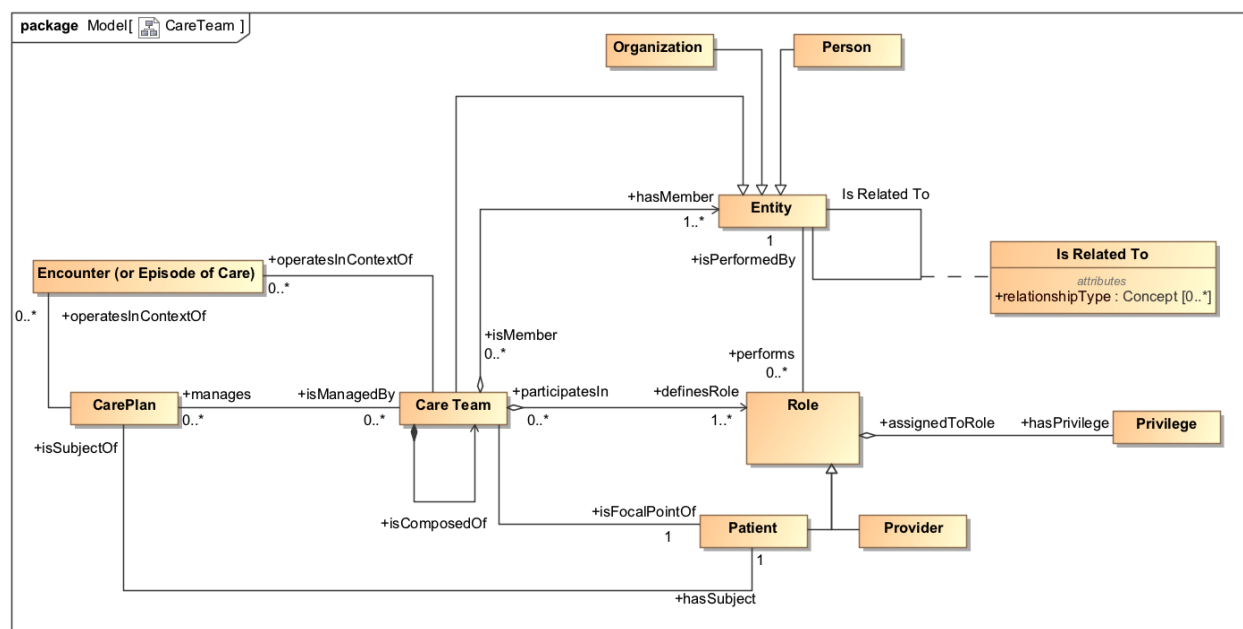


Figure 1: Care Team Conceptual Model

Core Concepts

A **care team** defines a number of **roles** and **relationships** required for the proper care of a patient. Many different types of roles may be required for the care of the patient. Some typical roles include the primary care provider (Dr. John Carlson), the care coordinator (Debra Smith - Rose Valley Primary Care), or the nutritionist (Maria Gonzalez, RD).

Roles are generally *performed by* known **entities** - the patient (Betsy Johnson), her daughter (Daisy), the nephrologist (Dr. Vince Jones). Other roles may be performed by a number of entities based on shift assignment such as the attending-in-charge in an inpatient setting and, in some cases, by organizations such as Meals-on-Wheels. In the case of the latter, knowledge of the actual person behind the role is less relevant than the role the organization plays vis-a-vis the patient's care. For instance, in the Meals-on-Wheel case, knowledge of the person who made the delivery is not as important as the organization to contact when a delivery is not made or the schedule for food delivery. Note that a role may even be specified without an associated entity.

Entities are generally real-world concepts that persist over time, have a unique identity, and which can assume a number of roles while participating in care-related activities. They participate in the care of the subject through their roles in the care team. Entities are typically organizations (Rose Valley Primary Care, Nephrology Clinic, Meals-on-Wheels) or individuals (Betsy Johnson, Debra Smith, Dr. John Carlson) but can also be devices, other care teams, etc...

Care team participants may be assigned specific role-based **privileges** when caring for the subject of the care team. In some cases, the subject of the care team may assign or revoke certain privileges when managing their own care. While the notion of *privilege* is introduced in this ballot submission, we leave its formal definition to future ballot cycles when such use cases will be addressed.

Entities can be *related to one another* through **entity relationships**. For instance, Daisy Johnson *is the daughter of* Betsy Johnson. Dr. John Carlson *is the primary care physician of* Betsy Johnson (and also the primary care physician on the care team), etc... Such relationships may evolve over time. It is important to note that the role an entity plays in the care of a patient may not always be related to their relationship to the patient. For instance, the patient's cardiologist may function as the primary care provider in an assembled care team.

The activities performed by care team members are generally specified in an explicit or implicit **care plan** *managed by* the care team. The definition of the care plan concept lies outside the scope of this submission but aspects of a care plan pertinent to care-team-related use cases shall be addressed in future submissions. The relationship between the care team and the care plan that guides its activities is fundamental to proper coordination of care as evidenced by the Betsy Johnson Storyboard.

Lastly, care teams may manage a patient's care plan within the context of one or more encounters within an episode of care. In this document we acknowledge the importance of this relationship but the definition of Encounter and Episode of Care are both outside the scope of this submission. Relevant aspects of both shall be addressed in future submissions.

Logical Model

The proposed Care Team Logical Model is adopted from the CIMI Care Model with some modifications to support this submission (namely, the addition of the PatientCentricCareTeam class and the NonCredentialedCareGiver). This model further elaborates the Care Team Conceptual Model by adding inheritance relationships, class attributes, and formal types to the concepts surfaced in the conceptual model.

The following sections introduce a number of core logical classes surfaced in the Care Team Conceptual Model and provides definitions for each class and attribute introduced in the model. Please refer to Appendix 1 for the definition of CIMI primitives and core data types referenced in the CIMI Logical model.

Entity and Role - Overview

The Entity and Role classes both specialize a common EntityOrRole class. This specialization allows participation attributes in clinical activities to reference either an entity (John Smith) or a role (the Primary Care Physician role performed by John Smith). Both classes, Entity and Role are intended to be specialized as illustrated in later sections of this document.

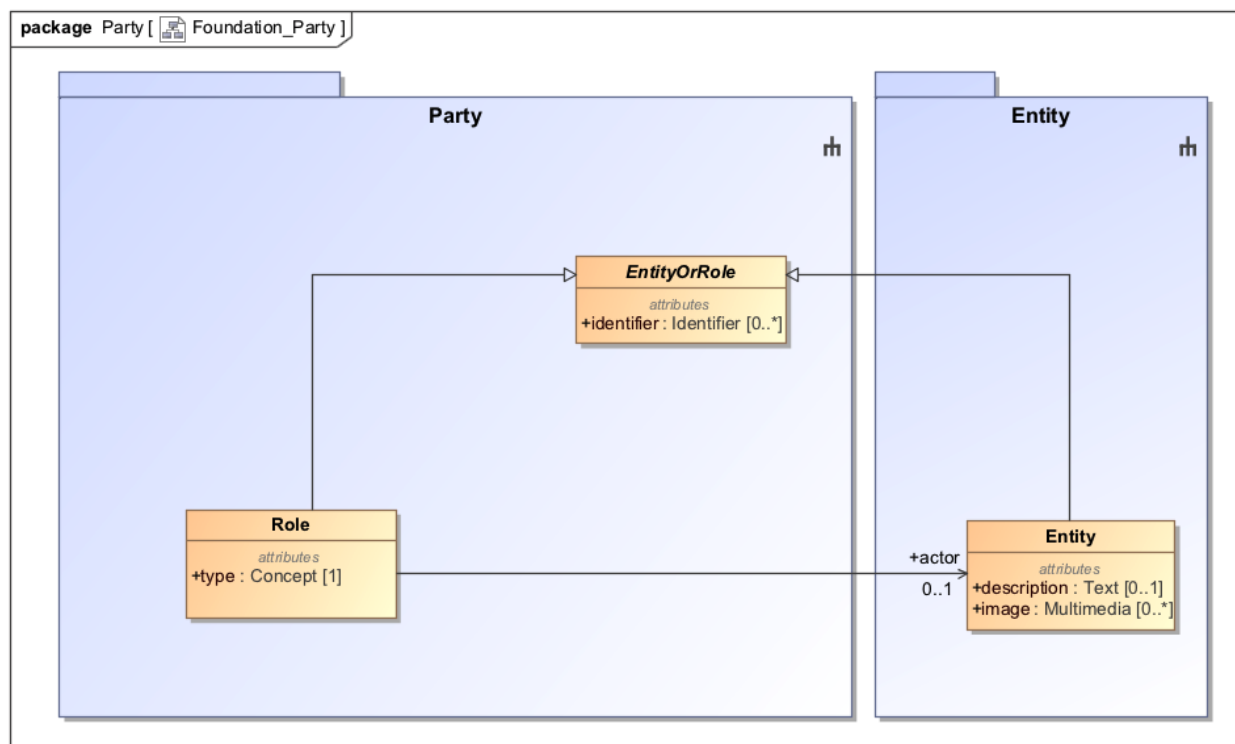


Figure 2: Top-Level Role and Entity Logical Classes

Class EntityOrRole

A party may be either an entity such as a specific person or organization or a role played by an entity such as patient or care provider.

Name	EntityOrRole
Qualified Name	CIMI Foundation RM::Party::EntityOrRole
Abstract	true

Attribute Detail

identifier

An identifier for the role or the entity such as a social security identifier or a provider identifier within the scope of an institution.

Type	Identifier
Multiplicity	0..*

Class Role

Capacity in which an actor is involved in an activity. For instance, 'attending physician'.

Note that attributes of the actor (an entity) that remain constant regardless of the role the actor plays should be part of the entity and not the role. For instance, a person may be a practitioner and a patient. In both cases their date of birth will be the same and thus such information should not be part of the role.

Name	Role
Qualified Name	CIMI Foundation RM::Party::Role
Abstract	false
Base Classifier	EntityOrRole

Attribute Detail

actor

The entity performing the role.

Type	Entity
Multiplicity	0..1

type

The type of role taken on by an entity participating in an activity.

Type	Concept
Multiplicity	1

Class Entity

Root class for entities such as people, organizations, and devices that have a separately identifiable existence.

Name	Entity
Qualified Name	CIMI Foundation RM::Entity::Entity
Abstract	true
Base Classifier	EntityOrRole

Attribute Detail

description

A human-readable description of the entity.

Type	Text
Multiplicity	0..1

image

One or more images of this entity such as a profile image or a product image for a catalog.

Type	Multimedia
Multiplicity	0..*

Care Team Overview

In this model, the Patient-Centric CareTeam is a type of role-based team and itself a CIMI Entity. This allows a care team to perform a role in another care team.

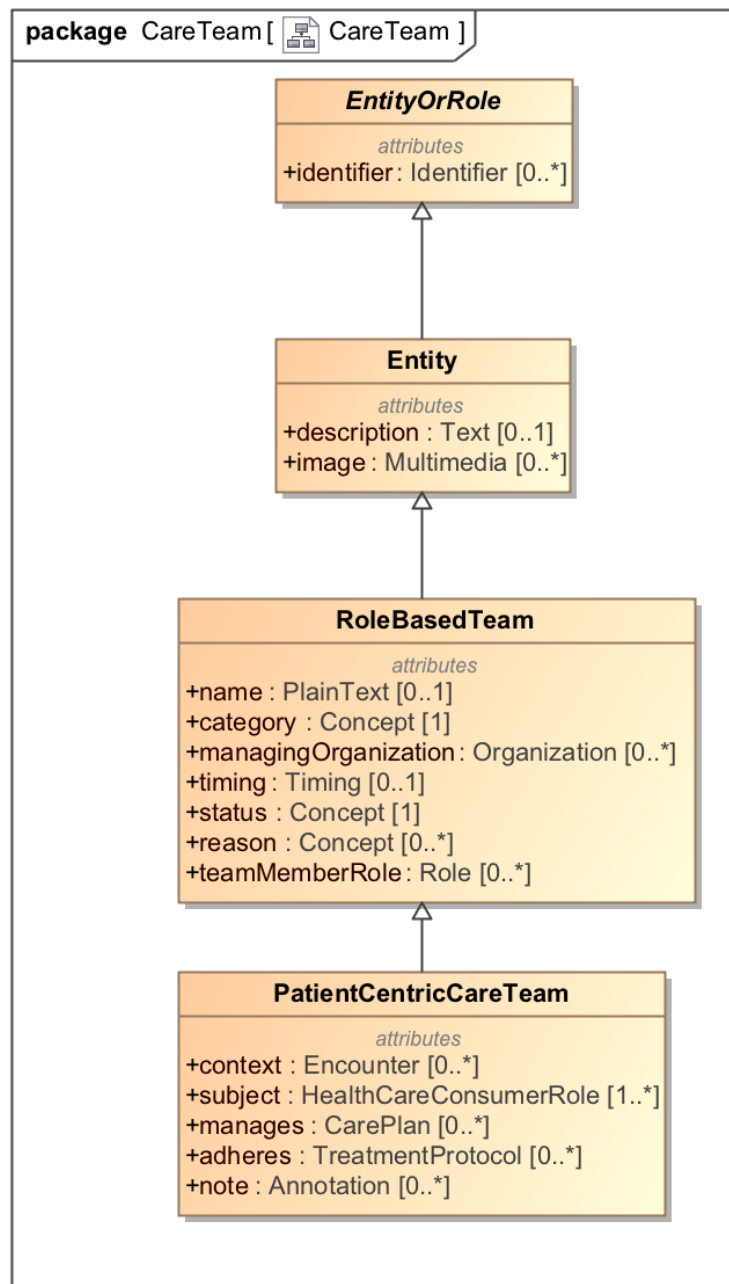


Figure 3: Patient-Centric Care Team Conceptual Model

Class RoleBasedTeam

A team or grouping of roles assembled for a specific purpose such as a provider group or a care team.

Name	RoleBasedTeam
Qualified Name	CIMI Clinical::CareTeam::RoleBasedTeam
Abstract	false
Base Classifier	Entity

Attribute Detail

category

Identifies what kind of team. This is to support differentiation between multiple co-existing teams, such as care plan team, episode of care team, longitudinal care team.

Type	Concept
Multiplicity	1

managingOrganization

The organization(s) responsible for the team.

Type	Organization
Multiplicity	0..*

name

The assigned name of the role group.

Type	PlainText
-------------	-----------

Multiplicity	0..1
---------------------	------

reason

Describes why the team exists.

Type	Concept
Multiplicity	0..*

status

Indicates the current state of the team such as proposed | active | suspended | inactive

Type	Concept
Multiplicity	1

teamMemberRole

Identifies all roles specified for the team and associated entities.

Type	Role
Multiplicity	0..*

timing

Indicates when the team did (or is intended to) come into effect and end.

Type	Timing
Multiplicity	0..1

Class PatientCentricCareTeam

The Care Team includes all the roles and entities performing these roles who plan to participate in the coordination and delivery of care for a patient. *Note: this class has been introduced in the CIMI model to support this submission.*

Name	PatientCentricCareTeam
Qualified Name	CIMI Clinical::CareTeam::PatientCentricCareTeam
Abstract	false
Base Classifier	RoleBasedTeam

Attribute Detail

adheres

Specifies a treatment protocol followed by the care team.

Type	TreatmentProtocol
Multiplicity	0..*

context

The encounter that establishes the context for this care team.

Type	Encounter
Multiplicity	0..*

manages

Associates zero or more care plans to the care team.

Type	CarePlan
Multiplicity	0..*

note

Comments made about the care team.

Type	Annotation
Multiplicity	0..*

subject

Identifies the health care recipient whose intended care is handled by the team.

Type	HealthCareConsumerRole
Multiplicity	1..*

Class CarePlan

At this time, CarePlan is considered outside the CareTeam modelling. A CarePlan class is included in this document solely to demonstrate the relationship between a care team with the care plan(s) managed by the care team.

Name	CarePlan
Qualified Name	CIMI Clinical::CareTeam::CarePlan
Abstract	false
Status	Not yet implemented in CIMI

Role - Overview

The PatientCentricCareTeam Logical Model defines a number of clinical and non-clinical role specializations. They are described below:

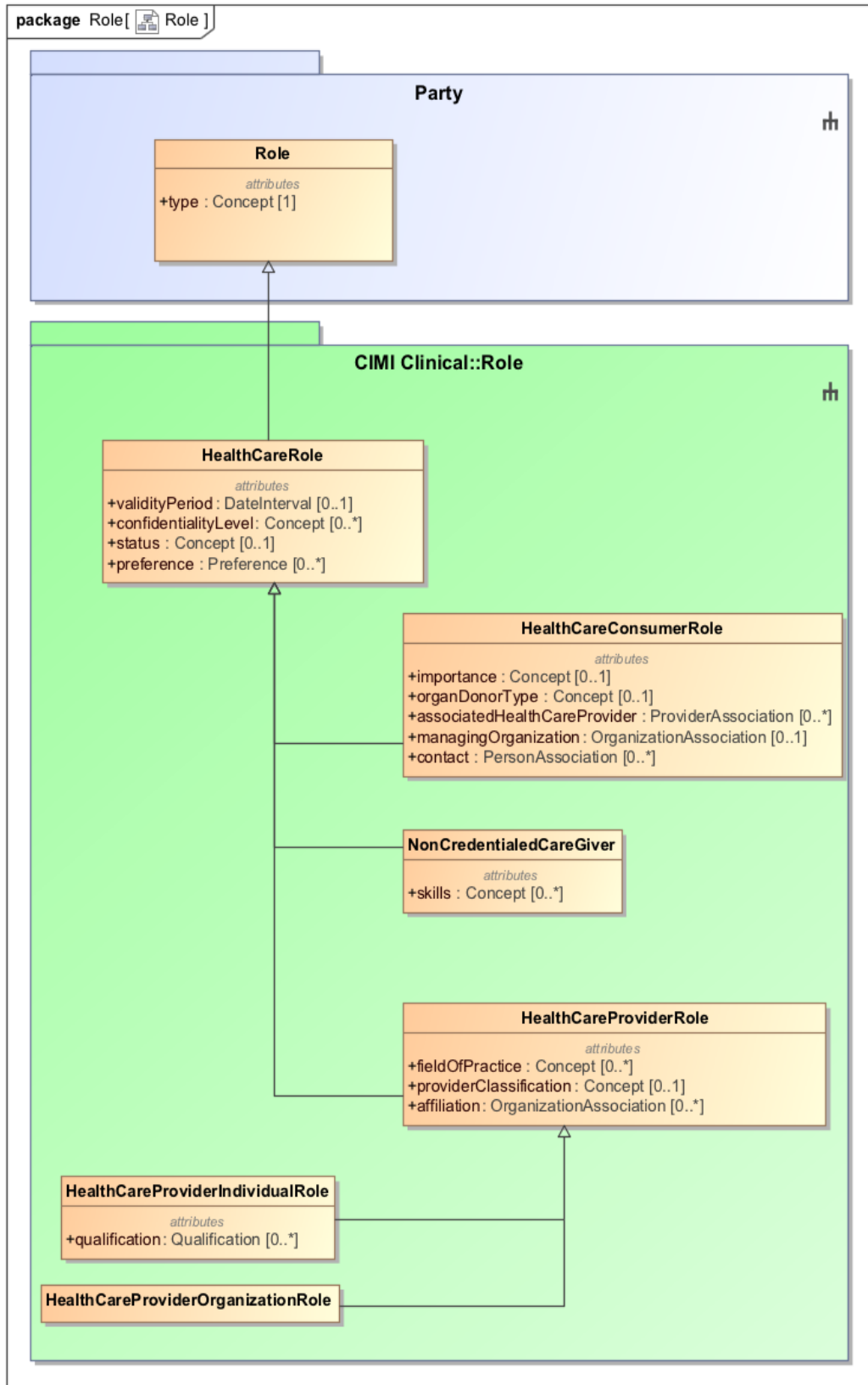


Figure 4: Clinical Role Specializations

Class HealthCareRole

A role associated with the delivery or consumption of health care services.

Name	HealthCareRole
Qualified Name	CIMI Clinical::Role::HealthCareRole
Abstract	false
Base Classifier	Role

Attribute Detail

confidentialityLevel

Confidentiality level conferred to the role.

Type	Concept
Multiplicity	0..*

preference

Preferences stated and captured for this role. Typically preferences refer to patient or care provider preferences such as a preferred diet (patient) or communication method (both).

Type	Preference
Multiplicity	0..*

status

The status of the role.

Type	Concept
-------------	---------

Multiplicity	0..1
---------------------	------

validityPeriod

Time interval when role is assumed.

Type	DateInterval
Multiplicity	0..1

Class HealthCareConsumerRole

Role assumed by an entity acting as a health care consumer.

Name	HealthCareConsumerRole
Qualified Name	CIMI Clinical::Role::HealthCareConsumerRole
Abstract	false
Base Classifier	HealthCareRole

Attribute Detail

associatedHealthCareProvider

The health care provider associated with this role such as the primary provider for a patient.

Type	ProviderAssociation
Multiplicity	0..*

contact

A contact party (e.g. guardian, partner, friend) for the patient

Type	PersonAssociation
Multiplicity	0..*

importance

Importance associated with the given role such as VIP, etc...

Type	Concept
Multiplicity	0..1

managingOrganization

Organization that is the custodian of the patient record. In the context of care team, it may be responsible for the administrative and financial management of the care team.

Type	OrganizationAssociation
Multiplicity	0..1

organDonorType

Type of organ donor.

Type	Concept
Multiplicity	0..1

Class NonCredentialedCareGiver

An informal and non-credentialed care giver such as a family member with skills relevant to the provision of patient care. *Note: this class has been introduced in the CIMI model to support this submission.*

Name	NonCredentialedCareGiver
Qualified Name	CIMI Clinical::Role::NonCredentialedCareGiver
Abstract	false
Base Classifier	HealthCareRole

Attribute Detail

skills

Skills relevant to patient care possessed by the entity assuming this role.

Type	Concept
Multiplicity	0..*

Class HealthCareProviderRole

Role associated with the delivery of health care as opposed to a consumer of health care.

Name	HealthCareProviderRole
Qualified Name	CIMI Clinical::Role::HealthCareProviderRole
Abstract	false
Base Classifier	HealthCareRole

Attribute Detail

affiliation

A membership, association, or connection to an organization that grants certain rights and privileges, such as admitting or visiting.

Type	OrganizationAssociation
Multiplicity	0..*

fieldOfPractice

The field of practice for the given provider.

Type	Concept
-------------	---------

Multiplicity	0..*
---------------------	------

providerClassification

Classification for this role.

Type	Concept
Multiplicity	0..1

Class HealthCareProviderIndividualRole

A healthcare provider role associated with a person.

Name	HealthCareProviderIndividualRole
Qualified Name	CIMI Clinical::Role::HealthCareProviderIndividualRole
Abstract	false
Base Classifier	HealthCareProviderRole

Attribute Detail

qualification

A right to practice medicine obtained by training and certification.

Type	Qualification
Multiplicity	0..*

Class HealthCareProviderOrganizationRole

A non-person health care entity such as a medical group or other organization.

Name	HealthCareProviderOrganizationRole
Qualified Name	CIMI Clinical::Role::HealthCareProviderOrganizationRole
Abstract	false
Base Classifier	HealthCareProviderRole

Class does not define any attributes.

Class NonCredentialedCareGiver

An informal and non-credentialed caregiver such as a family member with skills relevant to the provision of patient care.

Name	NonCredentialedCareGiver
Qualified Name	CIMI Clinical::Role::NonCredentialedCareGiver
Abstract	false
Base Classifier	HealthCareRole

Attribute Detail

skills

Skills relevant to patient care possessed by the entity assuming this role.

Type	Concept
Multiplicity	0..*

Foundational Entities

The following section presents some foundational entities defined in CIMI such as Organization, Device, and Person. The CIMI Logical Model also defines a number of clinical specialization of foundational entities such as ClinicalDevice and HealthCareOrganization but these are out of the scope of this submission.

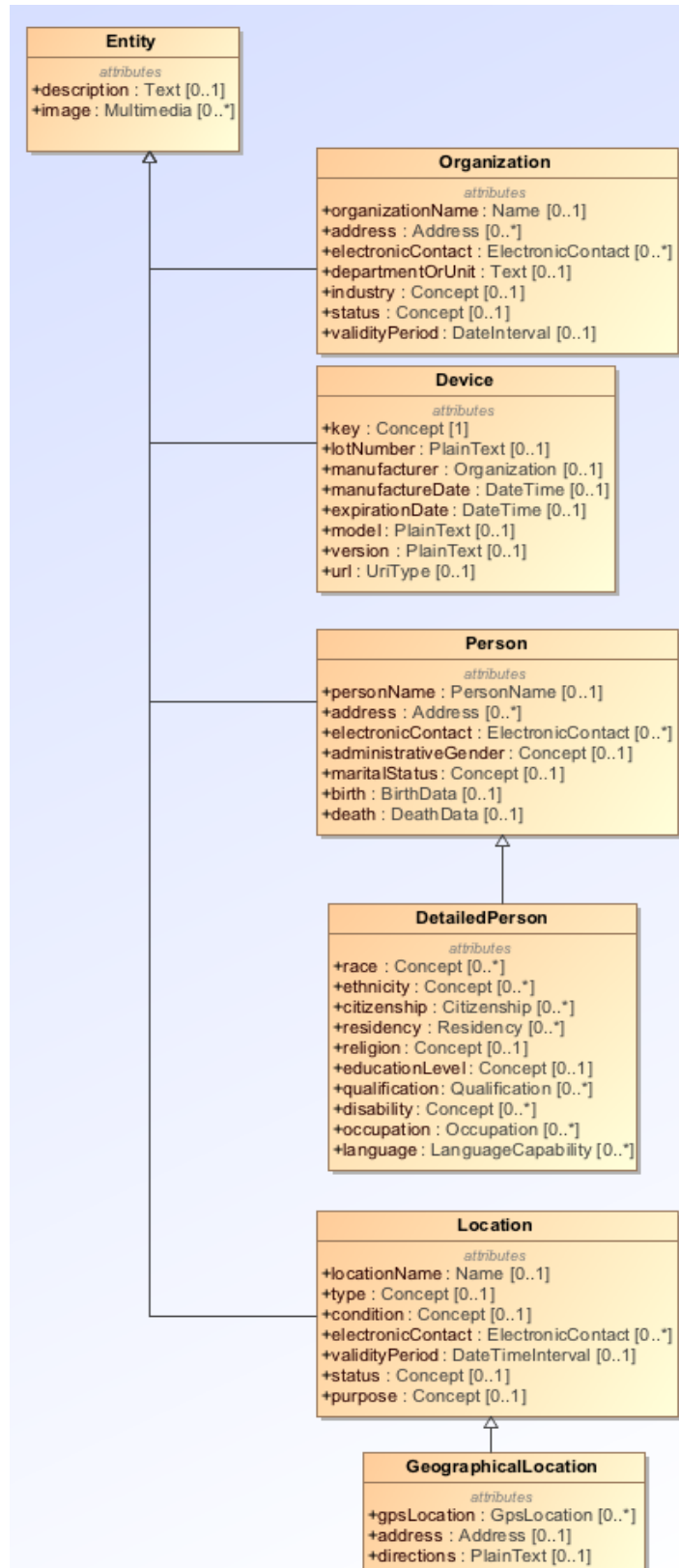


Figure 5: Common Entities

Class Organization

A description of a social or legal structure formed by human beings.

Name	Organization
Qualified Name	CIMI Foundation RM::Entity::Organization
Abstract	false
Base Classifier	Entity

Attribute Detail

address

The address of the organization

Type	Address
Multiplicity	0..*

departmentOrUnit

The department or unit in question.

Type	Text
Multiplicity	0..1

electronicContact

The electronic contact information for this organization.

Type	ElectronicContact
Multiplicity	0..*

industry

The industry code associated with this organization.

Type	Concept
Multiplicity	0..1

organizationName

The name of the organization.

Type	Name
Multiplicity	0..1

status

The status of the organization.

Type	Concept
Multiplicity	0..1

validityPeriod

The date range associated with the existence or relevance of the organization in the given context.

Type	DateInterval
Multiplicity	0..1

Class Person

Base person class.

Name	Person
------	--------

Qualified Name	CIMI Foundation RM::Entity::Person
Abstract	false
Base Classifier	Entity

Attribute Detail

address

The person's address.

Type	Address
Multiplicity	0..*

administrativeGender

The administrative gender of the person.

Type	Concept
Multiplicity	0..1

birth

Information about the birth of the person.

Type	BirthData
Multiplicity	0..1

death

Information about the death of the person.

Type	DeathData
Multiplicity	0..1

electronicContact

Contact information for the person.

Type	ElectronicContact
Multiplicity	0..*

maritalStatus

The person's marital status.

Type	Concept
Multiplicity	0..1

personName

The person's name.

Type	PersonName
Multiplicity	0..1

Class DetailedPerson

Refinement of the Person class with additional attributes.

Name	DetailedPerson
Qualified Name	CIMI Foundation RM::Entity::DetailedPerson

Abstract	false
Base Classifier	Person

Attribute Detail

citizenship

The person's citizenship.

Type	Citizenship
Multiplicity	0..*

disability

A physical or mental impairment that substantially limits one or more major life activity, for example, caring for oneself, performing manual tasks, seeing, hearing, eating, sleeping, walking, etc.

Type	Concept
Multiplicity	0..*

educationLevel

The education level of the person.

Type	Concept
Multiplicity	0..1

ethnicity

Identification with or belonging to a social group that has a common national or cultural tradition. (US only) An indicator of Hispanic or Latino origin.

Type	Concept
-------------	---------

Multiplicity	0..*
---------------------	------

language

The language(s) spoken by the individual.

Type	LanguageCapability
Multiplicity	0..*

occupation

Person's occupation

Type	Occupation
Multiplicity	0..*

qualification

The qualifications of the person.

Type	Qualification
Multiplicity	0..*

race

A subjective association of a person with a named category of humans sharing common history, traits, place of origin, or other inherited background. (US only) The race code associated with this person.

Type	Concept
Multiplicity	0..*

religion

The religion of the person

Type	Concept
Multiplicity	0..1

residency

The person's country of residence.

Type	Residency
Multiplicity	0..*

Class Device

This resource identifies an instance or a type of a manufactured item that is used in the provision of healthcare without being substantially changed through that activity. The device may be a medical or non-medical device. Medical devices includes durable (reusable) medical equipment, implantable devices, as well as disposable equipment used for diagnostic, treatment, and research for healthcare and public health. Non-medical devices may include items such as a machine, cellphone, computer, application, etc.

Name	Device
Qualified Name	CIMI Foundation RM::Entity::Device
Abstract	false
Base Classifier	Entity

Attribute Detail

expirationDate

The date and time beyond which this device is no longer valid or should not be used (if applicable).

Type	DateTime
-------------	----------

Multiplicity	0..1
---------------------	------

key

Concept representing the type of device.

Type	Concept
Multiplicity	1

lotNumber

Lot number assigned by the manufacturer.

Type	PlainText
Multiplicity	0..1

manufactureDate

The date and time when the device was manufactured.

Type	DateTime
Multiplicity	0..1

manufacturer

A name of the manufacturer.

Type	Organization
Multiplicity	0..1

model

The "model" is an identifier assigned by the manufacturer to identify the product by its type.
This number is shared by the all devices sold as the same type.

Type	PlainText
Multiplicity	0..1

url

A network address on which the device may be contacted directly.

Type	UriType
Multiplicity	0..1

version

The device software or firmware version label.

Type	PlainText
Multiplicity	0..1

Class Location

A description of a location in terms of who to contact at the location, and activities that may take place at the location. The subclasses of Location, GeographicalLocation and HealthCareFacilityLocation, define the actual location of the Location.

Name	Location
Qualified Name	CIMI Foundation RM::Entity::Location
Abstract	false
Base Classifier	Entity

Attribute Detail

condition

A description of the condition of the location.

Type	Concept
Multiplicity	0..1

electronicContact

Contact information associated with this location - for instance, contact information to reserve the location.

Type	ElectronicContact
Multiplicity	0..*

locationName

Names associated with this location. E.g., 10 West Bed 2

Type	Name
Multiplicity	0..1

purpose

Indicates the purpose of this location.

Type	Concept
Multiplicity	0..1

status

A code representing the status of the location.

Type	Concept
Multiplicity	0..1

type

Indicates the type of location.

Type	Concept
Multiplicity	0..1

validityPeriod

The interval of time when this location is relevant or available.

Type	DateTimeInterval
Multiplicity	0..1

Class GeographicalLocation

A position, site, point in space, or polygon, designated either by altitude, latitude, and longitude or a postal address, and may be navigated to via directions.

Name	GeographicalLocation
Qualified Name	CIMI Foundation RM::Entity::GeographicalLocation
Abstract	false
Base Classifier	Location

Attribute Detail

address

The postal address associated with this location.

Type	Address
-------------	---------

Multiplicity	0..1
---------------------	------

directions

How to navigate to the location. May be context-sensitive.

Type	PlainText
Multiplicity	0..1

gpsLocation

The location's geospatial coordinates such as latitude and longitude.

Type	GpsLocation
Multiplicity	0..*

Value Set and Vocabularies

The Care Team model will need to be supported by vocabularies/valueset bindings when the model is implemented.

Since 2017, the Care Team project has worked under the auspices of the National Office of Coordinator (ONC) for Health IT to develop and propose two valueset to support such purpose.

Care Team Category/Type valueset

The following codes have been created and approved by LOINC. They are adopted for use in the current release of FHIR CareTeam resource.

- Include codes from <http://loinc.org> where concept is-a LA27975-4 (Event-focused care team)
- Include codes from <http://loinc.org> where concept is-a LA27976-2 (Encounter-focused care team)
- Include codes from <http://loinc.org> where concept is-a LA27977-0 (Episode of care-focused care team)
- Include codes from <http://loinc.org> where concept is-a LA27978-8 (Condition-focused care team)
- Include codes from <http://loinc.org> where concept is-a LA28865-6 (Longitudinal care-coordination focused care team)
- Include codes from <http://loinc.org> where concept is-a LA28866-4 (Home & Community Based Services (HCBS)-focused care team)
- Include codes from <http://loinc.org> where concept is-a LA27980-4 (Clinical research-focused care team)
- Include codes from <http://loinc.org> where concept is-a LA28867-2 (Public health-focused care team)

Care Team Role Function Starter Valueset

The Care Team project has also created a proposed starter valueset for care team role functions. A significant number of concepts and code values have been identified from SNOMED CT based on the use cases discussed since beginning of 2017.

This document contains the proposed starter value set: [Example Value Set for CareTeam-Member RoleFunction_v03_20180119](#)



CareTeam-Member_
RoleFunction_v03_201

The project team also identified a number of required concepts that are not currently available in SNOMED CT. A submission has been made to SNOMED CT US for them to be included into the current US realm SNOMED CT release.

This document contains the proposed concepts submission to SNOMED CT US: [Example Value Set for CareTeam-SNOMED-Codes-Request_2018-03-29](#)



CareTeam-SNOMED-
Codes-Request_2018-

Appendix 1 - CIMI Primitive and Core Data Types

The following section provides a reference for the CIMI Primitive and Core Data Types referenced in the CIMI Logical Model.

CIMI Primitive Types

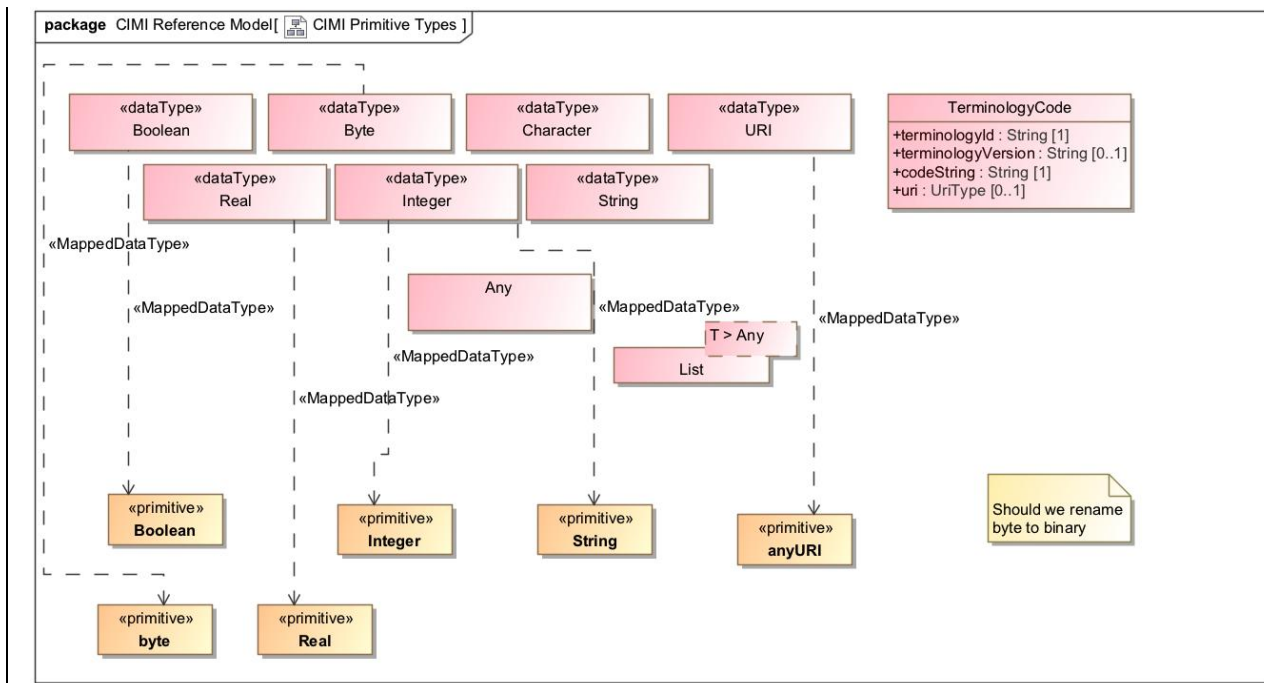


Figure 6: CIMI Primitive Types

Class Any

Abstract supertype. Usually maps to a type like "Any" or "Object" in an object system. Defined here to provide the value and reference equality semantics.

Name	Any
Qualified Name	CIMI Reference Model::PrimitiveTypes::Any
Abstract	false

Class List

An ordered collection of items with non-unique membership.

Name	List
Qualified Name	CIMI Reference Model::PrimitiveTypes::List
Abstract	false
Base Classifier	Any

Class TerminologyCode

The representation of a conceptual idea represented by an ontology or controlled vocabulary.

Name	TerminologyCode
Qualified Name	CIMI Reference Model::PrimitiveTypes::TerminologyCode
Abstract	false
Base Classifier	Any

Attribute Detail

codeString

The unique concept identifier in the terminology system name space.

Type	String
Multiplicity	1

terminologyId

An identifier for the terminology system that forms the name space for the code string. E.g., SNOMED CT, LOINC, etc...

Type	String
Multiplicity	1

terminologyVersion

The version of the terminology system.

Type	String
Multiplicity	0..1

uri

The unique resource identifier for this concept reference.

Type	UriType
Multiplicity	0..1

CIMI Core Data Types

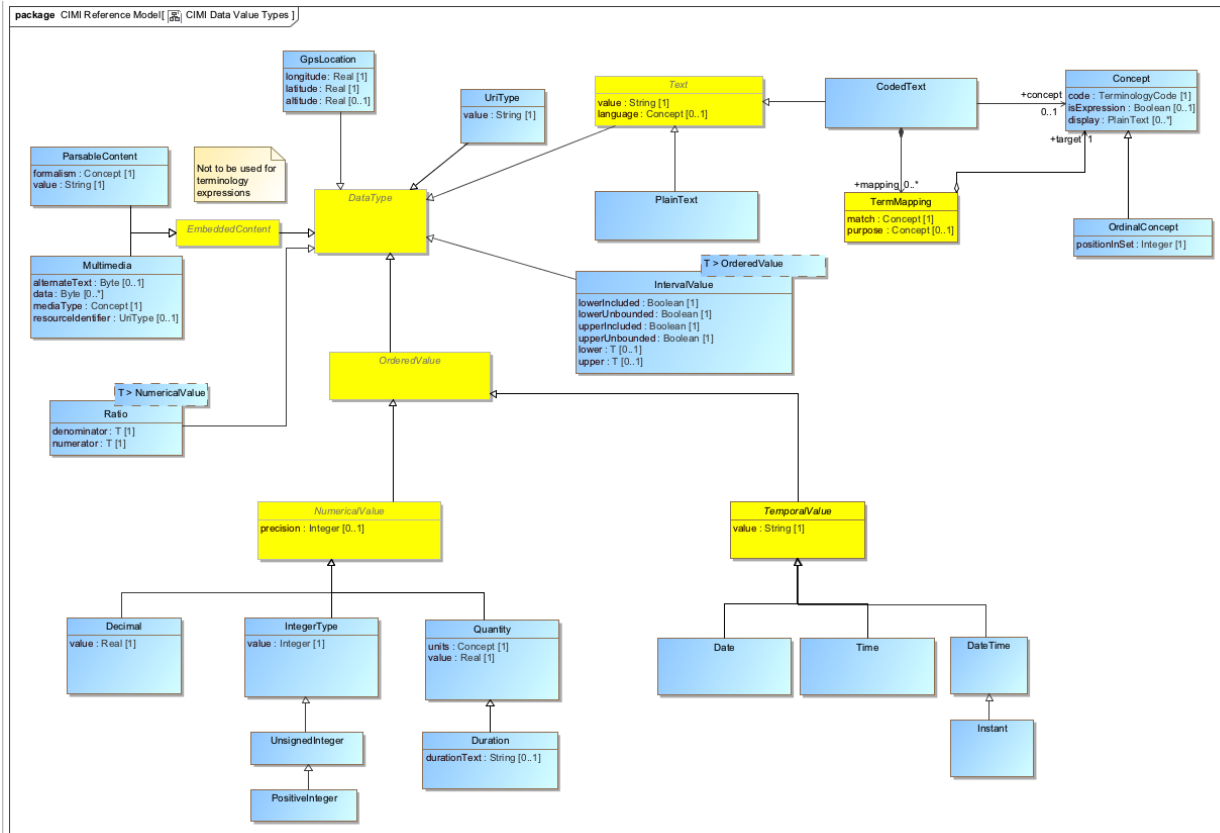


Figure 7: CIMI Data Types

Class DataType

Serves as a common ancestor of all CIMI types which represent the core granularity of the model.

Name	DataType
Qualified Name	CIMI Reference Model::DataTypes::DataType
Abstract	true
Base Classifier	NonIndependent

Class CodedText

A Text in a human language whose meaning is captured as concept in a formal terminology. Since CodedText is a subtype of Text, it can be used in place of it, effectively allowing the type Text to mean a text that may optionally be coded. A common use is to record the coded version of a verbatim text (a text originally selected or entered by a human).

Name	CodedText
Qualified Name	CIMI Reference Model::DataTypes::CodedText
Abstract	false
Base Classifier	Text

Attribute Detail

concept

A concept from a formal terminology that is equivalent to the semantics of CodedText.value.

Type	Concept
Multiplicity	0..1

mapping

Modified the definition further as follows: A concept, usually drawn from an alternative code system, that is related to CodedText.concept. Mapping may be used, for instance, when the originator uses a local terminology but also supplies one or more equivalents from standard terminologies (e.g. LOINC).

Type	TermMapping
Multiplicity	0..*

Class Concept

A reference to a concept in a terminology or an ontology.

Name	Concept
Qualified Name	CIMI Reference Model::DataTypes::Concept
Visibility	public
Abstract	false
Base Classifier	DataType

Attribute Detail

code

The concept reference that represents the target concept in the chosen terminology system.

Type	TerminologyCode
Multiplicity	1

display

The preferred language-specific textual rendition of the code attribute, preferably as specified by the code system.

Type	PlainText
Multiplicity	0..*

isExpression

A flag indicating if the value in the code field is a parsable expression comprised of codes and operators, rather than a single code. If omitted, the system can assume the code is not an expression.

Type	Boolean
Multiplicity	0..1

Class Decimal

Rational numbers that have a decimal representation. Decimals may not use exponents, and leading 0 digits are not allowed.

Name	Decimal
Qualified Name	CIMI Reference Model::DataTypes::Decimal
Abstract	false
Base Classifier	NumericalValue

Attribute Detail

value

The value of the decimal number.

Type	Real
Multiplicity	1

Class EmbeddedContent

Abstract parent class for all types of encapsulated data, such as media files.

Name	EmbeddedContent
------	-----------------

Qualified Name	CIMI Reference Model::DataTypes::EmbeddedContent
Abstract	true
Base Classifier	DataType

Class GpsLocation

A location on the surface of the Earth, described by a latitude and longitude (and optional altitude).

Name	GpsLocation
Qualified Name	CIMI Reference Model::DataTypes::GpsLocation
Abstract	false
Base Classifier	DataType

Attribute Detail

altitude

Altitude with WGS84 datum

Type	Real
Multiplicity	0..1

latitude

Latitude with WGS84 datum

Type	Real
-------------	------

Multiplicity	1
---------------------	---

longitude

Longitude with WGS84 datum

Type	Real
Multiplicity	1

Class Instant

An instant in time - known at least to the second and always includes a time zone. Note: This is intended for precisely observed times (typically system logs etc.), and not human-reported times - for them, use date and dateTime. instant is a more constrained dateTime

Name	Instant
Qualified Name	CIMI Reference Model::DataTypes::Instant
Abstract	false
Base Classifier	DateTime

Class IntervalValue

A generic class defining an interval (i.e. range) of any ordered value type. The type T must be a descendant of the type OrderedValue.

Name	IntervalValue
Qualified Name	CIMI Reference Model::DataTypes::IntervalValue
Abstract	false

Base Classifier	DataType
------------------------	----------

Attribute Detail

lower

The lower bound of the interval. Values below the lower bound lie outside the interval.

Type	T
Multiplicity	0..1

lowerIncluded

A flag, when true, indicates the specified lower bound is part of the interval. If the interval is lower unbounded, this flag is ignored.

Type	Boolean
Multiplicity	1

lowerUnbounded

A flag indicating the interval does not have a lower bound. If true, a lower bound may not be specified.

Type	Boolean
Multiplicity	1

upper

The upper bound of the interval. Values above the upper bound lie outside the interval.

Type	T
Multiplicity	0..1

upperIncluded

A flag, when true, indicates the specified upper bound is part of the interval. If the interval is upper unbounded, this flag is ignored.

Type	Boolean
Multiplicity	1

upperUnbounded

A flag indicating the interval does not have an upper bound. If true, an upper bound may not be specified

Type	Boolean
Multiplicity	1

Class Multimedia

A representation of media files, such as audio, visual, biosignal, and similar types.

Name	Multimedia
Qualified Name	CIMI Reference Model::DataTypes::Multimedia
Abstract	false
Base Classifier	EmbeddedContent

Attribute Detail

alternateText

Text to display in lieu of multimedia display/replay.

Type	Byte
Multiplicity	0..1

data

The actual data found at uri, if supplied inline.

Type	Byte
Multiplicity	0..*

mediaType

Data media type representing the mime type of the content.

Type	Concept
Multiplicity	1

resourceIdentifier

URI reference to electronic information stored outside the record as a file, database entry etc, if supplied as a reference.

Type	UriType
Multiplicity	0..1

Class OrderedValue

Abstract class defining a value on a number line or time line, whose location (magnitude) may be given precisely, or bounded by another value.

Name	OrderedValue
------	--------------

Qualified Name	CIMI Reference Model::DataTypes::OrderedValue
Abstract	true
Base Classifier	DataType

Class NumericalValue

Abstract class defining quantified amounts.

Name	NumericalValue
Qualified Name	CIMI Reference Model::DataTypes::NumericalValue
Abstract	true
Base Classifier	OrderedValue

Attribute Detail

precision

The accuracy of the value, in terms of number of significant figures. For example, a number like 12,345.67 might be declared as accurate to 3 significant digits, meaning digits in the 10's place, 1's place, or to the right of the decimal represent false precision.

Type	Integer
Multiplicity	0..1

Class Decimal

Rational numbers that have a decimal representation. Decimals may not use exponents, and leading 0 digits are not allowed.

Name	Decimal
Qualified Name	CIMI Reference Model::DataTypes::Decimal
Abstract	false
Base Classifier	NumericalValue

Class IntegerType

A countable quantity, used for values such as number of pregnancies or number of cigarettes smoked in a day. Not to be used for amounts that have units.

Name	IntegerType
Qualified Name	CIMI Reference Model::DataTypes::IntegerType
Abstract	false
Base Classifier	NumericalValue

Attribute Detail

value

The integer count value.

Type	Integer
Multiplicity	1

Class UnsignedInteger

An integer whose value is greater or equal to zero.

Name	UnsignedInteger
Qualified Name	CIMI Reference Model::DataTypes::UnsignedInteger
Abstract	false
Base Classifier	IntegerType

Class PositiveInteger

An integer whose value is greater than zero.

Name	PositiveInteger
Qualified Name	CIMI Reference Model::DataTypes::PositiveInteger
Abstract	false
Base Classifier	UnsignedInteger

Attribute Detail

units

Units, expressed expressed as codes (generally UCUM), e.g. "kg/m2", "mm[Hg]", "ms-1", "km/h". Implemented accordingly in subtypes.

Type	Concept
Multiplicity	1

value

Numeric magnitude of the quantity.

Type	Real
Multiplicity	1

Class Quantity

Quantified type representing scientific quantities, i.e. quantities expressed as a magnitude and units of measure. Quantities can also be used for time durations, where it is more convenient to treat these as simply a number of seconds rather than days, months, years.

Name	Quantity
Qualified Name	CIMI Reference Model::DataTypes::Quantity
Abstract	false
Base Classifier	NumericalValue

Class Duration

Represents a length of time, independent of any specific point time. Duration is expressed in customary format, i.e. days, hours, minutes, etc. Note that durations cannot be used to represent points or intervals in time.

Name	Duration
Qualified Name	CIMI Reference Model::DataTypes::Duration
Abstract	false
Base Classifier	Quantity

Attribute Detail

durationText

An string expressed in terms of days, hours, minutes, seconds, whose semantics follow ISO8601.

Type	String
Multiplicity	0..1

Class OrdinalConcept

Represents rankings and scores, e.g. pain, Apgar values, etc, where there is a) an implied ordering, b) no implication that the distance between each value is constant, and c) the total number of values is finite. This class can be used for recording symbolic values, e.g., the results on a urinalysis strip {neg, trace, moderate, ...} or numbers like Apgar values {0, 1, 2, 3, ...}.

Note that although the term "ordinal" in mathematics means natural numbers only, here any integer is allowed, since negative and zero values are often used by medical professionals for values around a neutral point, for example {-3, -2, -1, 0, 1, 2, 3} for reflex response values.

Name	OrdinalConcept
Qualified Name	CIMI Reference Model::DataTypes::OrdinalConcept
Abstract	false
Base Classifier	Concept

Attribute Detail

positionInSet

The rank order in the enumeration of values, used for sorting. While any integer value can be used, the values need to reflect the order in the set. For example, ordering as {1, 2, 3, ...} has the same effect as ordering as {0, 1, 2, ...}

Type	Integer
Multiplicity	1

Class ParsableContent

Encapsulated data expressed as a parsable text. The internal syntax of the data item is not described, but must follow the given formalism.

Name	ParsableContent
Qualified Name	CIMI Reference Model::DataTypes::ParsableContent
Abstract	false
Base Classifier	EmbeddedContent

Attribute Detail

formalism

Name of the formalism, e.g. GLIF 1.0 , Proforma etc.

Type	Concept
Multiplicity	1

value

The string, which may validly be empty in some syntaxes.

Type	String
Multiplicity	1

Class PlainText

A text with optional human language. While the attributes of PlainText and Text are the same, the PlainText class should be used when the text will not be coded (since CodedText is a child of Text but not PlainText).

Name	PlainText
Qualified Name	CIMI Reference Model::DataTypes::PlainText
Abstract	false
Base Classifier	Text

Class Ratio

A parameterizable ratio, where the numerator and denominator should not be reduced to a decimal, such as 3 tablets/day.

Name	Ratio
Qualified Name	CIMI Reference Model::DataTypes::Ratio
Abstract	false
Base Classifier	DataType

Attribute Detail

denominator

The denominator of the ratio.

Type	T
Multiplicity	1

numerator

The numerator of the ratio.

Type	T
Multiplicity	1

Class TemporalValue

An abstract class representing a point in time to some accuracy, following the semantics of ISO 8601.

Name	TemporalValue
Qualified Name	CIMI Reference Model::DataTypes::TemporalValue
Abstract	true
Base Classifier	OrderedValue

Attribute Detail

value

A date/time string following the semantics of ISO8601.

Type	String
Multiplicity	1

Class Date

Represents one day in time, as measured on the Gregorian calendar, used for recording time when the exact time is unknown or excessive precision is undesired, such as birth dates. Date uses the semantics defined by ISO 8601.

Name	Date
------	------

Qualified Name	CIMI Reference Model::DataTypes::Date
Abstract	false
Base Classifier	TemporalValue

Class Time

Represents a point in time from an origin usually interpreted as meaning the start of the current day. Used for recording a time of (any) day, not an absolute point in time. Typically used for times of events such as substance administrations.

Name	Time
Qualified Name	CIMI Reference Model::DataTypes::Time
Abstract	false
Base Classifier	TemporalValue

Class DateTime

A date, date and time or partial date (e.g. just year or year + month) as used in human communication. If hours and minutes are specified, a time zone SHALL be populated. Seconds must be provided due to schema type constraints but may be zero-filled and may be ignored. Dates SHALL be valid dates. The time "24:00" is not allowed.

Name	DateTime
Qualified Name	CIMI Reference Model::DataTypes::DateTime
Abstract	false
Base Classifier	TemporalValue

Class Instant

An instant in time - known at least to the second and always includes a time zone. Note: This is intended for precisely observed times (typically system logs etc.), and not human-reported times - for them, use date and dateTime. instant is a more constrained dateTime

Name	Instant
Qualified Name	CIMI Reference Model::DataTypes::Instant
Abstract	false
Base Classifier	DateTime

Class TermMapping

Represents an alternative ("mapped") Concept associated with a source concept (i.e., CodedText.concept or the textual value of the CodedText when no equivalent concept has been defined), and the relative match of the mapped Concept with respect to the source Concept. Mappings may be used to add classification terms (e.g. adding ICD classifiers to SNOMED descriptive terms), for computational convenience, or to provide equivalents in other terminologies (e.g. across nursing vocabularies).

Name	TermMapping
Qualified Name	CIMI Reference Model::DataTypes::TermMapping
Abstract	false
Base Classifier	DataType

Attribute Detail

match

The relative match of the mapped concept to the original (target) concept. Examples include broader (i.e., the mapped term is more general than the original), equivalent, narrower (e.g. mapped concept is "atypical diabetes mellitus" and the original term is "diabetes mellitus"), or unknown.

Type	Concept
Multiplicity	1

purpose

The purpose of the mapping, e.g., automated data mining, billing, or interoperability.

Type	Concept
Multiplicity	0..1

target

The target concept of the mapping, i.e., the original concept that has been mapped.

Type	Concept
Multiplicity	1

Class Text

Abstract parent for plain textual and coded text items, which may contain any amount of legal characters arranged as e.g. words, sentences etc (i.e. one Text may be more than one word). Visual formatting and hyperlinks may be included.

Name	Text
Qualified Name	CIMI Reference Model::DataTypes::Text
Abstract	true

Base Classifier	DataType
------------------------	----------

Attribute Detail

language

The text's language.

Type	Concept
Multiplicity	0..1

value

The text itself, which may contain any amount of legal characters arranged as e.g. words, sentences etc. Visual formatting and hyperlinks may be included.

Type	String
Multiplicity	1

Class UriType

A reference to an object which conforms to the Universal Resource Identifier (URI) standard. See "Universal Resource Identifiers in WWW" by Tim Berners-Lee at <http://www.ietf.org/rfc/rfc3986.txt>.

Name	UriType
Qualified Name	CIMI Reference Model::DataTypes::UriType
Abstract	false
Base Classifier	DataType

Attribute Detail

value

Value of URI

Type	String
Multiplicity	1