

Model Specification of Quality

Improvement and Clinical Knowledge (QUICK), Release 1

September 2014

Supplementary Material

Sponsored by:  
Clinical Quality Information

Clinical Decision Support

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Acknowledgments

This guide was produced as part of a combined effort with members from multiple HL7 Workgroups related to health quality. This group gratefully acknowledges input from numerous HL7 community members, as well as members of the broader health care community.

QUICK learns from and builds upon work done in several other projects and specifications including HL7 FHIR, vMR, QDM, QRDA, and CCDA. Many of the model elements and their documentation are drawn from these and other specifications.

The Clinical Statements Working Group and the Architecture Review Board are designated as Other Interested Parties for this specification.

Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| Rev | Date | By Whom | Changes |
| 1 | 8/01/14 | Aziz Boxwala | Submission to For-Comment ballot |

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# action

Package: QUICK Class Model



## act

Package: action











### Act

The object of an action, the specific healthcare thing that is being done or proposed.

### CareProgramParticipation

Description of the participation of a patient in a recognized program of care such as a care plan, a chemotherapy protocol, or a clinical trial.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| goals | StatementOfOccurrence | **[0..\*]** | The goals that have been established for the patient as part of the care plan and the performance against those goals. |
| participationStatus | CodeableConcept |  | A patient's state of participation within the care plan, e.g., enrolled, ongoing, completed, suspended.  This status is different than the status of the action, e.g., proposal to enroll a patient in a care plan will have status as "accepted", but the patient may still not be enrolled. |
| program | Identifier | **[0..1]** | The specific program in which the patient is enrolled, was enrolled, or is being enrolled. |
| programType | CodeableConcept |  | The type of the care program such as Care Plan, Clinical Trial, Chemotherapy Protocol |

### Communication

A communication is a message sent between a sender and a recipient for a purpose and about a topic. Messages may be multipart each part having its own content-type.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| medium | CodeableConcept | **[0..\*]** | The communication medium, e.g., email, fax |
| message | Attachment | **[0..\*]** | Text and other information to be communicated to the recipient |
| recipient | Entity | **[0..\*]** | The entity (e.g., person, organization, clinical information system, or device) which is the intended target of the communication |
| relatedStatement | ClinicalStatement | **[0..\*]** | Any statement that is pertinent to the message |
| sender | Entity | **[0..1]** | The entity (e.g., person, organization, clinical information system, or device) which is the source of the communication |

### CompositeIntravenousMedicationAdministration

IV fluid administration that may consist of one or more additives mixed into a diluent. Additives and diluents are represented as constituents with the appropriate constituentType.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| constituent | Constituent | **[1..\*]** | The constituents of this composite IV medication. |
| totalVolume | Quantity | **[0..1]** | The total volume of the overall mixture such as the volume of the bag |

### DeviceUse

Application or use of equipment or device for the patient. E.g., wheelchair, Holter monitor, pacemaker, intra-uterine contraceptive device

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| applicationSchedule | Schedule | **[0..1]** | If the application or use of the supply or equipment is repeated, the frequency pattern for repetitions. |
| device | Device |  | The details of the device used or to be used. |
| targetBodySite | BodySite | **[0..1]** | Body site where the device is to be used. |

### DiagnosticImaging

An Imaging examination. For instance, Chest Radiograph - PA and Lateral.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| contrast | MedicationTreatment | **[0..1]** | Contrast if any to be administered for this procedure. |
| isolationCode | CodeableConcept | **[0..1]** | Specification for type of precautions that should be taken when in proximity to the patient. For instance, Airborne Precautions, Contact Precautions, Droplet Precautions, Standard Precautions. |
| portableExam | boolean | **[0..1]** | Designation of whether or not the imaging procedure should be performed at the patient's bedside (Yes) or if the procedure can be conducted in the location of the performing department (No). |
| radiationDose | Range | **[0..1]** | The amount of radiation intended to be administered to a patient |
| sedation | boolean | **[0..1]** | Sedation is required or was administered for this procedure. |
| stressor | CodeableConcept | **[0..1]** | Type of physiologic or pharmacologic stress that will be subjected to the patient during the imaging procedure. For example, Adenosine, Dipyrdomole, Persantine, Thallium, Cardiolite, Dobutamine, Treadmill. |
| transportMode | CodeableConcept | **[0..1]** | How a patient will be moved from their hospital room to the performing department |

### Diet

Description of diet/nutrition to be administered to a patient.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| foodModifier | string | **[0..1]** | This modifier is used to convey order-specific modifiers about the type of food that should be given. These can be derived from patient allergies, intolerances, or preferences. They can also be specific to the order and not have any relationship to the allergies, intolerances, or preferences |
| nutritionItem | NutritionItem | **[0..\*]** | Different items that combine to make a complete description of the nutrition to be administered |

### Encounter

Description of an interaction between a patient and healthcare provider(s) for the purpose of providing healthcare service(s) or assessing the health status of a patient.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| class | code |  | Classification of the encounter. For example, inpatient, outpatient, virtual.  (see http://hl7.org/fhir/encounter-class for values) |
| encounterSchedule | Schedule | **[0..1]** | If the encounter is repeated, the frequency pattern for repetitions. |
| hospitalization | Hospitalization | **[0..1]** | Details about an admission to a clinic |
| length | Quantity | **[0..1]** | Quantity of time the encounter lasted. |
| location | Location | **[0..\*]** | The location the encounter takes place, e.g., clinic location, hospital bed |
| partOf | StatementOfOccurrence | **[0..1]** | Another Encounter of which this encounter is a part of (administratively or in time). |
| relatedCondition | EncounterCondition | **[0..1]** | The conditions considered and cared for within this encounter. This includes items such as reason for visit, admission diagnosis, discharge diagnosis, chief complaint. Do not use reason or indication in the Action class to specify encounter related diagnoses. |
| serviceProvider | Organization | **[0..1]** | Department or team providing care. |
| serviceType | CodeableConcept | **[0..\*]** | The type of service provided during the encounter. For example, surgery, rehabilitation, annual physical exam.  Value Set http://hl7.org/fhir/vs/encounter-type |

### Goal

A defined target or measure to be achieved in the process of patient care; a desired outcome. A typical goal is expressed as a change in status expected at a defined future time.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| goalAchievementTargetTime | Period | **[0..1]** | The time that is targeted for the goal to be attained. For example, there may be a goal to reach a weight of X pounds by a particular date. |
| goalFocus | CodeableConcept |  | The metric that is the clinical subject of the goal. Typically a measurable clinical attribute of the subject. E.g., weight, blood pressure, hemoglobin A1c level. |
| goalPursuitEffectiveTime | Period | **[0..1]** | The time in which the subject pursues the goal. This includes pursuing maintenance of a goal that has already been achieved.  The end time of the interval may be "open" or not stated, if the goal is being indefinitely pursued. This time is optional, as, for example, one may simply wish to propose weight loss without specifying a pursuit effective time. |
| goalValue | Element |  | The metric whose achievement would signify the fulfillment of the goal. E.g., 150 pounds, 7.0%. |

### Hospitalization

Details about an admission to a hospital.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| admissionSourceType | CodeableConcept | **[0..1]** | The location type from where the patient arrived for admission, e.g., ED, another hospital, an ambulatory care facility |
| dischargeDisposition | CodeableConcept | **[0..1]** | The final place or setting to which the patient was discharged on the day of discharge. e.g., home, hospice, expired |

### Immunization

Descriptor for the administration of vaccines to patients across all healthcare disciplines in all care settings and all regions. This does not include the administration of non-vaccine agents, even those that may have or claim immunological effects.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| dosage | Dosage | **[0..\*]** | The dose of the vaccine administered or to be administered |
| protocol | VaccinationProtocol | **[0..1]** | The role of the dose in an immunization protocol |
| reported | CodeableConcept | **[0..1]** | True if this statement describes the reported prior administration of a dose of vaccine rather than directly administered |
| vaccine | Vaccine |  | The vaccine product that is administered |

### LaboratoryTest

A procedure to test a tissue or fluid specimen from a patient, e.g., complete blood count, blood culture.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| collectionMethod | CodeableConcept | **[0..1]** | Specification of how the specimen for testing should be obtained |
| specialHandling | CodeableConcept | **[0..\*]** | Special instructions on how to handle a laboratory specimen. For example, 'Keep on ice'. |
| specimenSource | Specimen | **[0..1]** | The source of the laboratory specimen to be collected. |
| suspectedPathogen | CodeableConcept | **[0..\*]** | The pathogen or pathogens that are felt to be the most likely cause of the patient's condition that led to the laboratory procedure proposal. For instance, Staphylococcus, Streptococcus, Pseudomonas, Neisseria. |

### MedicationTreatment

A description of the action of treating a patient's condition with a medication.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| dispense | Dispense | **[0..1]** | Dispensation details to be used only when needed, e.g., as part of a statement about a prescription or a dispensation event. |
| dosage | Dosage | **[0..\*]** | Details for the dose or doses of medication administered or to be administered to the patient |
| medication | Medication | **[0..1]** | Identifies the medication being dispensed or administered. |

### PatientControlledAnalgesia

Patient Controlled Analgesia administration. For instance, morphine PCA, 5 mg loading dose, followed by 10 mg/hr basal rate, 1 mg demand dose, lockout interval 10 min.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| lockoutInterval | Range |  | The amount of time that must elapse after a PCA demand dose is administered before the next PCA demand dose can be delivered. For example, 10 minutes. |

### Procedure

A procedure is an activity that is performed with or on a patient as part of the provision of care. This can be a physical 'thing' like an operation, or less invasive like counseling or hypnotherapy. Examples include surgical procedures, diagnostic procedures, endoscopic procedures, biopsies, and exclude things for which there are specific types of acts defined, such as those for immunizations, medication administrations, nutrition administration, and use of devices.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| approachBodySite | BodySite | **[0..1]** | The body site used for gaining access to the target body site. E.g., femoral artery for a coronary angiography. |
| procedureCode | CodeableConcept |  | This is the code that identifies the procedure with as much specificity as available, or as required. E.g., appendectomy, coronary artery bypass graft surgery. |
| procedureMethod | CodeableConcept | **[0..1]** | Describes the method used for the procedure and can vary depending on the procedure. For example, a surgical procedure method might be laparoscopic surgery or robotic surgery; an imaging procedure such as a chest radiograph might have methods that represent the views such as PA and lateral; a laboratory procedure like urinalysis might have a method of clean catch; a respiratory care procedure such as supplemental oxygen might have a method of nasal cannula, hood, face mask, or non-rebreather mask. |
| procedureSchedule | Schedule | **[0..1]** | If the procedure is repeated, the frequency pattern for repetitions. |
| targetBodySite | BodySite | **[0..\*]** | The body site where the procedure takes place. E.g., left lower arm for fracture reduction. |

### Radiotherapy

Procedure to administer treatment using high energy radiation.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| localizationMethod | LocalizationMethod | **[0..\*]** | The imaging modality and the frequency will be used to confirm that a tumor/target is in the same position at the time of treatment as it was at the time of simulation are defined. For example, an order may indicate that a cone-beam CT (CBCT) should be acquired just prior to each treatment to confirm that a lung tumor is within a target volume. |
| motionManagement | MotionManagement | **[0..\*]** | The positioning and type of immobilization for various parts of the body are defined. For example, an order might indicate that the head should be hyper-extended and immobilized in a head-support and thermoplastic mask. |
| percentageCoveredOfBodySite | Quantity | **[0..1]** | Percent of the target body site structured of relevance to which the total dose volume applies site (e.g., 60% of the left kidney) |
| simulationMethod | RadiotherapySimulation | **[0..\*]** | The type of imaging and any accessories that will be used during the simulation session are defined. For example, an order might indicate that the simulation should be done using a 4-dimensional PET-CT with 5mm slices, no bolus and wire (to mark surgical scar). |
| treatmentPlanningInstructions | Dosage | **[0..\*]** | The radiation delivery techniques to be used for treatment and the physician’s goals for how much radiation dose targets and normal tissues should receive are defined. For example, an order might indicate that a treatment should use intensity modulate x-ray radiation (IMXT) to deliver at least 50 Gy to 95% of a planning target volume but no more than 20 Gy to 20% of the total lung volume.  Please note the following guidance vis-a-vis dose:  1. The target volume delineation is captured as the dose's targetBodySite. Values may include: GTV, ITV, CTV and PTV, for instance.  2. doseQuantity may be used to represent 'dose per fraction' - e.g., 2 GY  3. doseRestriction may be used to represent to total dose or the number of fractions for a given volume delineation. Note that this value may specify either a minimum or maximum volume - e.g., 30 GY |

### RespiratoryCare

Procedures that encompass supplemental oxygen (eg, nasal cannula, face mask), BiPAP/CPAP, and mechanical ventilation.

Note: While these are vastly different respiratory care concepts, the associated data elements can be constrained through templates.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| ePAP | Range | **[0..1]** | Expiratory positive airway pressure, often expressed in cmH20 in the United States. Example: 5 cmH2O |
| fiO2 | Range | **[0..1]** | Fraction of inspired oxygen, expressed as a percentage. For example, 100%. |
| inspiratoryTime | Range | **[0..1]** | Specification of the duration of the positive airway pressume applied by a mechanical ventilator. For example, 1 second. |
| iPAP | Range | **[0..1]** | Inspiratory positive airway pressure, often expressed in cmH20 in the United States. For example, 10 cmH2O. |
| isolationCode | CodeableConcept | **[0..1]** | Describes the kinds of precautions that should be taken for the patient. Values include: Airborne Precautions, Contact Precautions, Droplet Precautions, Standard Precautions, Neutropenic (Reverse) Precautions. |
| oxygenFlowRate | Range | **[0..1]** | The rate at which oxygen is administered to the patient; generally in liters per minute |
| peakFlowRate | Range | **[0..1]** | Specification of the maximum allowable rate of airflow delivered by a mechanical ventilator. For example, 60 L/min. |
| peakInspiratoryPressure | Range | **[0..1]** | Specification of the maximum airway pressure allowed to be delivered by the ventilator in order to prevent barotrauma, applies to volume-controlled ventilation modes. For example, 35 cmH2O. |
| pEEP | Range | **[0..1]** | Positive end expiratory pressure, the alveolar pressure above atmospheric pressure that exists at the end of expiration, often expressed in cmH20 in the United States. For example, 5 cmH2O. |
| pressureSupport | Range | **[0..1]** | Specification of the additional amount of pressure that is added to a mechanical ventilation mode, often CPAP mode. Not to be confused with pressure control ventilation mode. For example, 500 mL |
| respiratoryRate | Range | **[0..1]** | Number of machine-delivered breaths per minute, in the context of mechanical ventilation, expressed as breaths/minute. For example, 14 breaths/minute. |
| spO2Range | Range | **[0..1]** | Target oxygen saturation, expressed as a percentage. For instance, 95-100%. |
| spO2Titration | Range | **[0..1]** | Titration instructions to achieve target oxygen saturation. An example might include: "Titrate oxygen to maintain SpO2 > 93%". |
| tidalVolume | Range | **[0..1]** | Volume of air delivered with each machine-delivered breath, often expressed in mL in the United States. For example, 500 mL. |
| ventilatorMode | CodeableConcept | **[0..1]** | Primary setting on a mechanical ventilator that specifies how machine breaths will be delivered to a patient.  Examples:Assist Control (AC), Synchronized Intermittent Mandatory Ventilation (SIMV), Pressure Support Ventilation (PS or PSV), Pressure-Regulated Volume Control (PRVC). |

## common

Package: action



### EncounterCondition

A condition that is considered within the encounter and the role that the condition played within the encounter, e.g., diagnosis at discharge.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| condition | StatementOfOccurrence |  | The reference to the condition such as a problem. |
| conditionRole | CodeableConcept |  | The role of the condition within an encounter, e.g., chief complaint, admission diagnosis, discharge diagnosis, comorbidity |

### Indication

An asserted clinical reason to perform a test, prescribe a medication, procedure, or perform a procedure, or perform any act.

The reason can be specified as a code or as another statement, e.g., code for diabetes (ICD-9-CM 250.0) or Condition (with diabetes code) documented elsewhere in a patient's record.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| narrative | string | **[0..1]** | A human readable description of the indicated reason. |
| reason | CodeableConcept | **[0..1]** | A code representing the reason. |
| supportingStatement | ClinicalStatement | **[0..1]** | A clinical statement that lends support for the indication. |

### Constituent

A component of a multi-component substance administration. May be an additive in a composite IV.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| constituent | MedicationIngredient |  | Generally the ingredient of the constituent (e.g., dopamine) and the quantity such as an additive in a composite IV. |
| constituentType | CodeableConcept |  | Indicates the category of the constituent. For instance, for a composite IV, the constituent may be either a 'diluent' or an 'additive'. For a TPN order, the constituent category may be a nutrient grouping such as 'electrolyte' or 'lipid', etc. |
| dose | Dosage |  | The dose of the constituent that makes up the whole. E.g., 500ml 50% Dextrose solution |

### AdministeredDose

How the medication has been administered to the patient.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| attestationType | CodeableConcept | **[0..1]** | How the dose administration was claimed or verified. E.g., patient-reported, observed by care provider, performed by care provider. Can be used as a gauge of reliability, or when verified substance administration (e.g., for tuberculosis treatment) is required. |

### Dispense

Details of the dispensation such as the days supply and quantity of medication (to be) dispensed.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| amount | Quantity | **[0..1]** | The number of units of the supply to be or that are actually dispensed. e.g., 30 tablets |
| authorizingPrescription | StatementOfOccurrence | **[0..1]** | Indicates the medication order that is being dispensed against. |
| expectedSupplyDuration | Duration | **[0..1]** | The duration (generally in days) this dispensation should last. |
| numberOfRepeatsAllowed | Quantity | **[0..1]** | The number of times the supply may be dispensed. For example, the number of times the prescribed quantity is to be supplied including the initial standard fill. |
| substitutionReason | CodeableConcept | **[0..1]** | Indicates the reason for the substitution of (or lack of substitution) from what was prescribed |
| substitutionType | CodeableConcept | **[0..1]** | A code signifying whether a different drug was dispensed from what was prescribed. |
| validityPeriod | Period | **[0..1]** | This indicates the validity period of a prescription (stale dating the Prescription). It reflects the prescriber perspective for the validity of the prescription. Dispenses must not be made against the prescription outside of this period. The lower-bound of the Dispensing Window signifies the earliest date that the prescription can be filled for the first time. If an upper-bound is not specified then the Prescription is open-ended or will default to a stale-date based on regulations. Rationale: Indicates when the Prescription becomes valid, and when it ceases to be a dispensable Prescription. |

### Dosage

Abstract class for concepts that represent how a medication is to be used by or administered to the patient.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| administrationFrequency | Schedule | **[0..1]** | The frequency pattern for administration of doses. e.g., three times per day after meals |
| approachBodySite | BodySite | **[0..1]** | The body site used for gaining access to the target body site for the purposes of the substance administration. This is the anatomic site where the substance first enters the body, e.g., left subclavian vein. |
| doseQuantity | Quantity | **[0..1]** | The amount of the therapeutic or other substance given at one administration event. e.g., 500 mg, 1 tablet, 1 teaspoon |
| doseType | CodeableConcept | **[0..1]** | The type of dose. E.g., initial, maintenance, loading. |
| infuseOver | Quantity | **[0..1]** | Represents the actual time the substance is infused. Note the difference between infuseOver and duration of treatment (specified in administrationFrequency). An order may call for infusing a patient TID for an hour each time over a duration of 5 days. |
| method | CodeableConcept | **[0..1]** | A coded value indicating the method by which the substance is introduced into or onto the body. Most commonly used for injections. Examples: Slow Push; Deep IV. Terminologies used often pre-coordinate this term with the route and or form of administration. |
| rate | Quantity | **[0..1]** | The speed with which the substance is introduced into the subject. Typically the rate for an infusion. e.g., 200ml in 2 hours. |
| rateIncrement | Range | **[0..1]** | Change in the dosing rate; usually an increase for a patient who is initiating tube feeding. E.g., 20 mL/hour. |
| rateIncrementInterval | Range | **[0..1]** | Period of time after which the deliveryRateIncrement should be attempted. E.g., 4 hours. |
| route | CodeableConcept | **[0..1]** | The physical route through which the substance is administered. E.g., IV, PO. |
| targetBodySite | BodySite | **[0..1]** | The body site where the substance is delivered. |

### DosageInstruction

Indicates how the medication is to be administered to or used by the patient.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| additionalInstructions | CodeableConcept | **[0..1]** | Additional instructions such as "Swallow with plenty of water" which may or may not be coded. |
| dosageInstructionsText | string | **[0..1]** | Free text dosage instructions for cases where the instructions are too complex to code. |
| maximumDeliveryRate | Quantity | **[0..1]** | The maximum rate of substance administration. This value may be used as a stopping condition when a deliveryRateIncrement is specified without a count. |
| maximumDosePerPeriod | Quantity | **[0..1]** | The maximum total quantity of a therapeutic substance that may be administered to a subject over the period of time. E.g. 1000mg in 24 hours. |
| maximumVolumeToDeliver | Quantity | **[0..1]** | The maximum volume of fluid to administer to a patient |
| minimumDosePerPeriod | Ratio | **[0..1]** | The minimum total quantity of a therapeutic substance that may be administered to a subject over the period of time. E.g., 10 mg in 24 hours. |
| rateGoal | Range | **[0..1]** | The target rate to reach for this infusion. Note that deliveryRateGoal is typically less than the maximum delivery rate which is the rate not to exceed. For enteral feeding orders, a target tube feeding rate of 75ml/hour may be specified. |
| validAdministrationInterval | Period | **[0..1]** | Acceptable time for administering the substance. Includes acceptable but suboptimal administration times. This is an important aspect of immunizations, which have recommended and acceptable/valid timeframes for administration that can differ. |

### EnteralFormula

A way to provide food through a tube placed in the nose, mouth, the stomach, or the small intestine.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| administration | DosageInstruction | **[0..1]** | Dosage and administration instructions for the enteral nutrition. |
| caloricDensity | Quantity | **[0..1]** | An amount of calories per volume which identifies the type of formula. |
| product | NutritionProduct |  | The nutritional product to be administered |

### LocalizationMethod

The imaging modality and the frequency with which it will be used to confirm that a tumor/target is in the same position at the time of treatment as it was at the time of simulation are defined. For example, an order may indicate that a cone-beam CT (CBCT) should be acquired just prior to each treatment to confirm that a lung tumor is within a target volume.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| comment | string | **[0..\*]** | Additional comments pertaining to the localization method. |
| frequency | Schedule | **[0..1]** | Defines how often the localization imaging should be performed. For example, a patient may have a cone-beam CT taken only once every 5 treatments. |
| localizationModality | CodeableConcept | **[0..1]** | Defines the imaging modality to be used to verify the positioning of a patient and/or target prior and/or during a radiation treatment. For example, a patient may have a cone-beam CT prior to treatment to verify that a lung tumor is within the targeted volume. |

### MotionManagement

A method to control the positioning and movement of a specific area of the body. Such motion management may be conducted during a procedure.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| immobilizationDevice | CodeableConcept | **[0..\*]** | Immobilization device refers to the device or devices used to maximize reproducibility of positioning and to minimize motion of a part of a body for each radiation treatment. For example, a commonly used immobilization device is a thermoplastic mask for patients being treated to the head and neck region. |
| position | CodeableConcept | **[0..1]** | Position defines the way that a patient should be positioned for a given procedure. Examples might include:  - Head: Tilted left or right, neck extended  - Body: Prone, supine, on left/right side  - Arms: Down by side, on chest, above head  - Legs: flat, bent |
| targetBodySite | BodySite | **[0..1]** | The area of the body whose motion is to be managed. |

### NutrientModification

Nutrient modifications allows specification of constraints on the quantity of components of diet.

NutrientModification consists of the nutrient (e.g., Sodium) and the amount in the diet (e.g., 20-30g).

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| nutrientType | CodeableConcept |  | The type of nutrient that this diet contains. Nutrient types include: carbohydrates, lipids and fats, salts such as Sodium or Potassium, fibers, and also fluids. |
| quantity | Range |  | Indicates how much of the nutrient is to be or was administered |

### NutritionItem

The details of the nutrition item, with specific attributes depending on the mode by which the nutrition is administered.

### NutritionalSupplement

A preparation intended to supplement the diet and provide calories or nutrients, such as vitamins, minerals, fiber, fatty acids, carbohydrates, or amino acids, that may be missing or may not be consumed in sufficient quantity in a person's diet. Such products may be ordered in addition to the diet (either general or therapeutic) to enhance a person’s intake. Supplemental food products provide some but not all of a patient’s nutritional needs.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| additiveProduct | NutritionProduct | **[0..1]** | Any additives to be provided or administered, e.g., protein supplement, fiber supplement |
| baseProduct | NutritionProduct |  | The base supplement to be provided or administered, e.g., standard formula |
| frequency | Schedule | **[0..1]** | The frequency with which this supplement is administered. |
| quantity | Range | **[0..1]** | How much of the nutritional supplement to administer |

### OralDiet

Concept generally representing food and/or a nutritional supplement prepared from food ingredients that is self-administered by a patient and consumed orally.

A patient can have only one effective oral diet at a time.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| dietType | CodeableConcept | **[0..\*]** | Specifies the type of diet ordered. The dietCode may specify what kind of diet is ordered such as 'Consistent carbohydrate diet'. |
| foodType | CodeableConcept | **[0..1]** | Indicates what type of food the diet should contain. |
| frequency | Schedule | **[0..1]** | The frequency with which this diet item is administered. |
| isInEffect | boolean | **[0..1]** | Indicates whether the diet item is currently in effect for the patient. |
| nutrient | NutrientModification | **[0..1]** | Consists of the nutrient (e.g., Sodium) and the amount in the diet (e.g., 20-30g) |
| texture | TextureModification | **[0..\*]** | Specifies or modifies the texture for one or more types of food in a diet |

### RadiotherapySimulation

The type of imaging and any accessories that will be used during a simulation session for radiotherapy. For example, an order might indicate that the simulation should be done using a 4-dimensional PET-CT with 5mm slices, no bolus and wire (to mark surgical scar).

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| bolusThickness | Range | **[0..1]** | Defines the thickness of the bolus material to be used. E.g., 5mm thick |
| bolusType | CodeableConcept | **[0..1]** | Defines the type of tissue-equivalent material that will be placed on a patient’s skin at the time of treatment to minimize the skin-sparing effect of high energy photon beams. For example, paraffin wax may be used as a bolus. |
| markerType | CodeableConcept | **[0..1]** | Defines the type of marker that will be used to define the targeted area for treatment planning or localize the targeted area during treatment. For example, gold coils may be placed within a tumor for localization during treatment. |
| scanThickness | Range | **[0..1]** | Defines the distance between each imaging slice. E.g., 5mm between axial slices of a CT scan. |
| simulationComment | string | **[0..1]** | Additional information pertaining to the simulation |
| simulationDimensions | CodeableConcept | **[0..1]** | Defines whether the imaging is volumetric (3D) and whether motion over time will be modeled (4D). E.g., 2D, 3D or 4D |
| simulationImagingType | CodeableConcept | **[0..1]** | Defines the type of imaging modality to be used. E.g., PET-CT, CT alone, CT-PET, CT-MRI, MRI alone. |

### TextureModification

TextureModification specifies or modifies the texture for one or more types of food in a diet, e.g., ground, chopped, or puree. Texture modification is part of the diet specification and may have different textures ordered for different food groups, e.g., ground meat.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| foodType | CodeableConcept |  | Indicates the type of food to which the texture modification applies. |
| textureModifier | CodeableConcept | **[0..1]** | A further modification to the texture, e.g. Pudding Thick. |
| textureType | CodeableConcept |  | A code that identifies any texture modifications that should be made, e.g., Pureed, Easy to Chew |

### VaccinationProtocol

Information about the protocol(s) under which the vaccine was administered

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| authority | Organization | **[0..1]** | Indicates the authority who published the protocol? E.g. ACIP. |
| description | string | **[0..1]** | The description about the protocol under which the vaccine was administered. |
| doseSequence | Quantity |  | Nominal position of dose in a series. |
| doseStatus | CodeableConcept | **[0..1]** | Indicates if the immunization event should "count" against the protocol. |
| doseStatusReason | CodeableConcept | **[0..1]** | Provides an explanation as to why a immunization event should or should not count against the protocol |
| doseTarget | CodeableConcept |  | The targeted disease. |
| series | string |  | One possible path to achieve presumed immunity against a disease - within the context of an authority |
| seriesDoses | Quantity |  | The recommended number of doses to achieve immunity |

## modality

Package: action



### Action

Description of a healthcare action, independent of the performance of the action.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| currentStatus | ActionStatus | **[0..1]** | The status of an action. It is expected that the range of values for statusCode (i.e., the value set) will vary by the subtypes of Action. For example, Proposal might have one of its status value as Declined. |
| indication | Indication | **[0..\*]** | Reason or justification for the action. Reasons may also be specified for not performing an action. |
| patientPreference | CodeableConcept | **[0..\*]** | Preferences are choices made by patients about options for care or treatment (including scheduling, care experience, and meeting of personal health goals) and the sharing and disclosure of their health information. |
| providerPreference | CodeableConcept | **[0..\*]** | Provider preferences are choices made by care providers relative to options for care or treatment (including scheduling, care experience, and meeting of personal health goals). |
| statusHistory | ActionStatus | **[0..\*]** | The past statuses of this action, e.g., an order may evolve from draft to placed to in progress to completed or canceled. |

### ActionStatus

Class describing the status of an action.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| reason | CodeableConcept | **[0..1]** | A coded reason for the status. This is used typically when the status indicates the action was canceled, rejected, or not performed. E.g., patient declined. |
| status | CodeableConcept |  | A coded value for the status, e.g., Completed, Rejected, Pending. The allowed values might differ in various subtypes of Action. |
| statusUpdateTime | dateTime |  | The date and time when the status was updated. |

### Order

An order is an instruction by a healthcare provider to another healthcare provider to perform some act.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| expectedPerformanceTime | Period | **[0..1]** | The time when the ordered act is expected to be performed. |
| fromProposal | StatementOfOccurrence |  | Identifies a proposal that led to this order. |
| orderedAtTime | dateTime | **[0..1]** | The time at which the order was created. |
| orderedBy | Practitioner | **[0..1]** | The responsible person who places this order, e.g., physician. This may be different than the author of the order, e.g., clerk, who may be the statement's author. |
| originationMode | CodeableConcept | **[0..1]** | The mode the order was received (such as by telephone, electronic, verbal, written). This describes 'how' the communication was done as opposed to dataSourceType which specifies the 'where' and 'from'. |
| prnReason | Indication | **[0..\*]** | The specific condition under which the act being ordered is performed. For example, Pain, Shortness of Breath, Insomnia, Nausea.  If this attribute is specified, it implies that the act must be performed as needed (i.e., is prn).  Reasons such as "SpO2 less than x%" should be addressed as a PRN Instruction rather than a PRN Reason as it is unlikely that a value set can be identified for such range of possible observations. |
| urgency | CodeableConcept | **[0..1]** | Characterizes how quickly the action must be initiated. Includes concepts such as stat, urgent, routine. |

### Performance

The actual performance or execution of a healthcare-related action, e.g., 3rd dose of Hepatitis B vaccine administered on Dec 4th 2012, appendectomy performed today.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| actionPerformed | CodeableConcept | **[0..1]** | Attribute that specifies the component of a composite action that was performed. For instance, the fulfillment of a prescription may result in both a substance administration event and a dispense event, thus resulting in two actions being performed.  let VancoDoseAdmin =  [MedicationTreatment, Performance: "Hospital measures-IV Vancomycin"] V  where  dosage[1].route in "Hospital measures-Route IV"  and IsEquivalent(actionPerformed, DoseAdministrationActionCode) |
| enactsPlan | StatementOfOccurrence | **[0..1]** | Identifies a plan that is partly or wholly enacted by the performance of this act |
| fromProposal | StatementOfOccurrence | **[0..1]** | Identifies a proposal that led to this order. |
| fulfillsOrder | StatementOfOccurrence | **[0..1]** | Identifies an order that is partly or wholly filled by the performance of this act |
| performanceTime | Period | **[0..1]** | The overall time period in which the action is performed. This may be different than the scheduled time or the expected performance time. Time for different activities performed within this action can be specified as subTasks. |
| performedBy | Participant | **[0..\*]** | The persons who perform this action, e.g., the person who administered the medication, performed the surgery.  A performance may have many participants In comparison, an order or a plan has one participant typically. Hence, in performance many participants can be described along with their specific roles. |

### Plan

A plan to perform an act. Typically, this would include a time at which the action is expected or scheduled to be performed.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| expectedPerformanceTime | dateTime | **[0..1]** | The time when the action is expected to be performed. |
| fromProposal | StatementOfOccurrence |  | Identifies a proposal that led to this order. |
| fulfillsOrder | StatementOfOccurrence |  | Identifies an order that is partly or wholly filled by the performance of this act |
| plannedAtTime | dateTime | **[0..1]** | The time at which the plan was created. |
| plannedBy | Person | **[0..1]** | The person who is the primary planner of this action, e.g., the person who scheduled the appointment |

### Proposal

The proposal may be a recommendation from a clinical decision support system or advice from a consultation.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| expectedPerformanceTime | Period | **[0..1]** | The time when the action is expected to be performed. |
| originationMode | CodeableConcept | **[0..1]** | The mode by which the proposal was received (such as by telephone, electronic, verbal, written). This describes 'how' the communication was done as opposed to dataSourceType which specifies the 'where' and 'from'. |
| prnReason | Indication | **[0..\*]** | The specific condition under which the act being proposed is performed. For example, Pain, Shortness of Breath, Insomnia, Nausea.  If this attribute is specified, it implies that the act must be performed as needed (i.e., is prn).  Reasons such as "SpO2 less than x%" should be addressed as a PRN Instruction rather than a PRN Reason as it is unlikely that a value set can be identified for such range of possible observations. |
| proposedAtTime | dateTime | **[0..1]** | The time when the proposal was made. |
| urgency | CodeableConcept | **[0..1]** | Characterizes how quickly the proposed act must be initiated. Includes concepts such as stat, urgent, routine. |

### ProposalAgainst

Concept represents a recommendation from a clinical decision support system or advice from a consultation to not perform an act.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| proposedAtTime | dateTime | **[0..1]** | The time when the proposal was made. |

# common

Package: QUICK Class Model



## AnchoredEvent

Identifies the timing of a point-in-time occurrence and optionally a sub-cycle in a cycle that starts at a specific point in the cycle and may span a duration of time.

For instance give a medication on the fifth, 10th, and 18th day of a 24-day cycle for a duration of 1 day each time, three times per day.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| cycle | Cycle | **[0..\*]** | If the occurrence has a duration and a frequency, it should be specified as a cycle.  For instance, give medication X on day 5 of a 22 day cycle, three times a day for 2 days. |
| pointInCycle | Quantity |  | The point within the cycle. For instance, for a cycle of 21 days, the 5th day in the cycle is equivalent to a pointInCycle = 5 day (read as Day 5). |

## BodySite

A location on a person's body. E.g., left breast, heart.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| anatomicalLocation | CodeableConcept |  | A location on a patient's body. May or may not encompass laterality. E.g., lung, left lung. |
| directionality | CodeableConcept |  | This is further specification of the body part by adding directionality, such as "upper", "lower", "frontal", "medial", etc. |
| laterality | CodeableConcept |  | The side of the body, from the Patient's perspective. E.g., left, right, bilateral. |

## CodedRecurringEvent

Specification of a repetitive schedule element as a code

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| repeatCode | CodeableConcept |  | A code indicating the frequency of the occurrence. For instance, Q8H or TID |

## Cycle

Represents a predictable periodic interval where events may occur at specific points within this interval. Examples may include:

1. An event that may occur TID.

2. An event that may occur TID but at specific times such as 8am, noon, and 3pm.

3. An event that may occur three times a day but the interval is not important.

4. An event that may occur three times a day where the interval between events must be 8hrs (Q8H).

Note that cycles may be nested. For instance,

A chemotherapy regimen where a substance is administered TID on day 1,5,10 of a 10-day cycle.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| cycleLagTime | Quantity |  | Positive offset between the end of the first cycle and the start of the second one. That is, the start of the next cycle shall start after then end of the previous cycle. |
| cycleLeadTime | Quantity |  | Negative offset between the end of the previous cycle and the start of the next cycle. That is, the start of the next cycle shall start before the end of the previous cycle. |
| cycleLength | Quantity |  | The duration of the overall cycle or subcycle. |
| cycleTiming | CycleEventTiming | **[0..\*]** | Identifies a repeating pattern to the intended time periods such as the number of occurrences in a given time period, the days in a multi-day cycle, or a code representing the frequency of occurrence for a given cycle. |
| endsOn | Period |  | Point in time when the cycle should end. |
| totalCycleCount | Quantity |  | Number of times to repeat the cycle including the first one. When not specified, assumed to be 1. |

## CycleEventTiming

Identifies a repeating pattern to the intended time periods such as the number of occurrences in a given time period, the days in a multi-day cycle, or a code representing the frequency of occurrence for a given cycle.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| when | CodeableConcept |  | A code that identifies the occurrence of daily life that determine timing.  This is an example value set with codes taken from http://hl7.org/fhir/v3/TimingEvent:  HS HS event occurs [duration] before the hour of sleep (or trying to).  WAKE WAKE event occurs [duration] after waking.  AC AC event occurs [duration] before a meal (from the Latin ante cibus).  ACM ACM event occurs [duration] before breakfast (from the Latin ante cibus matutinus).  ACD ACD event occurs [duration] before lunch (from the Latin ante cibus diurnus).  ACV ACV event occurs [duration] before dinner (from the Latin ante cibus vespertinus).  PC PC event occurs [duration] after a meal (from the Latin post cibus).  PCM PCM event occurs [duration] after breakfast (from the Latin post cibus matutinus).  PCD PCD event occurs [duration] after lunch (from the Latin post cibus diurnus).  PCV PCV event occurs [duration] after dinner (from the Latin post cibus vespertinus). |

## Participant

Person playing a specified role in an action.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| individual | Person |  | The healthcare professional or related person participating in the encounter. |
| participantRole | CodeableConcept | **[0..\*]** | Role of participant in encounter, e.g., admitter, attending, primary care physician |

## RecurringEvent

Specifies timing as a number of times the event occurs in the cycleLength and whether the time interval is important.

For instance, if the cycle length is 24 hours, the frequencyPerCycle is 3 and the intervalIsImportant is true, this is equivalent to stating that the event should occur every 8 hours (Q8H).

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| frequencyPerCycle | Range |  | Indicates how often the event should occur. If one specifies a range for frequencyPerCycle, it shall be interpreted as a frequency which may range from Low to High. |
| intervalIsImportant | boolean |  | Specifies whether a fixed interval between occurrences is important when true.  For instance, every 8 hours may mean:  Q8H - the interval between each occurrence has to be 8 hours (intervalIsImportant = true)  TID - the occurrence should happen 3 times within a 24 hour period but could occur with meals or when the patient is awake, etc... (intervalIsImportant = false) |

## Schedule

The recurrence pattern of events, e.g., three times a day after meals.

A schedule that specifies an event that may occur multiple times. Schedules should not be used to record when events did happen but rather when actions or events are expected or requested to occur.

A schedule can be either a list of 'calendar time' events - periods on which the event ought to occur, or a single event with repeating criteria, or just repeating criteria with no actual event as represented by the 'cycle' concept and attribute.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| cycle | Cycle | **[0..\*]** | Identifies a repeating pattern to the intended time periods.  If present, the Schedule.event indicates the time of the first occurrence. |
| event | Period |  | Identifies specific time periods when the event should occur.  Some schedules are just explicit lists of times. |

## entity

Package: common



### ComputerSystem

A service or information system excluding medical devices. Such services may include a communication service that generates an alert, a system that supports the persistence and retrieval of clinical information, or a clinical decision support system that may be the source of a proposal for a procedure.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| name | string | **[0..1]** | A name or label assigned to this system. |
| type | CodeableConcept | **[0..1]** | A code that represents the type of computer system. |

### Device

This element identifies an instance of a manufactured thing that is used in the provision of healthcare without being substantially changed through that activity. The device may be a machine, an insert, a computer, an application, etc. This includes durable (reusable) medical equipment as well as disposable equipment used for diagnostic, treatment, and research for healthcare and public health.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| location | Location | **[0..1]** | The resource may be found in a literal location (i.e. GPS coordinates), a logical place (i.e. "in/with the patient"), or a coded location. |
| model | string | **[0..1]** | Model identifier assigned by the manufacturer |
| owner | Organization | **[0..1]** | Information collected from a consumer, patient, or family member about their perception of the care they received or from a care giver about the care provided. |
| patient | Patient | **[0..1]** | Patient information, if the device is affixed to a person. |
| type | CodeableConcept | **[0..1]** | A code that identifies the type of device supplied with as much specificity as available. E.g., wheelchair |
| udi | Identifier | **[0..1]** | FDA Mandated Unique Device Identifier. Use the human readable information (the content that the user sees, which is sometimes different to the exact syntax represented in the barcode) - see http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/UniqueDeviceIdentification/default.htm. |
| url | uri | **[0..1]** | A network address on which the device may be contacted directly. |
| version | string | **[0..1]** | The version of the device, if the device has multiple releases under the same model, or if the device is software or carries firmware. |

### Entity

A physical thing, group of physical things or an organization. It is a concrete class that can be used as is or specialized as needed.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| characteristic | EntityCharacteristic | **[0..\*]** | The characteristics of this entity. |
| id | Identifier | **[0..1]** | The entity's unique identifier. Used for internal tracking purposes. It must be provided if user wants it returned as part of any output, otherwise it will be auto-generated, if needed, by CDS system. Does not need to be the entity's "real" identifier. |
| profileId | Identifier | **[0..\*]** | The identifier of a set of constraints placed on an Entity. If there are multiple templates specified for the element, then the element must satisfy ALL constraints defined in ANY template at that level. |

### EntityCharacteristic

Specific factors about a patient, clinician, provider, or facility. Included are demographics, behavioral factors, social or cultural factors, available resources, and preferences. Behaviors reference responses or actions that affect (either positively or negatively) health or healthcare. Included in this category are mental- health issues, adherence issues unrelated to other factors or resources, coping ability, grief issues, and substance use/abuse. Social/cultural factors are characteristics of an individual related to family/caregiver support, education and literacy (including health literacy), primary language, cultural beliefs (including health beliefs), persistent life stressors, spiritual and religious beliefs, immigration status, and history of abuse or neglect. Resources are means available to a patient to meet health and healthcare needs, which would include caregiver support, insurance coverage, financial resources, and community resources to which the patient is already connected and receiving benefit. Preferences are choices made by patients and their caregivers relative to options for care or treatment (including scheduling, care experience, and meeting of personal health goals) and the sharing and disclosure of their health information. In the quality data element the attribute source is used to indicate whether it relates to the patient or the provider

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| code | CodeableConcept |  | A code specifying the characteristic or feature |
| presence | boolean |  | Whether the characteristic is present or absent |

### Location

Details for a physical place where services are provided and resources and participants may be stored, found, contained or accommodated.

A Location includes both incidental locations (a place which is used for healthcare without prior designation or authorization) and dedicated, formally appointed locations. Locations may be private, public, mobile or fixed and scale from small freezers to full hospital buildings or parking garages.

Examples of Locations are:

Building, ward, corridor or room

Freezer, incubator

Vehicle or lift

Home, shed, or a garage

Road, parking place, a park

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| address | Address | **[0..1]** | An address for the location. |
| function | CodeableConcept | **[0..1]** | Indicates the type of function performed at the location. |
| name | string | **[0..1]** | A name for the location. Does not need to be unique. |
| partOf | Location | **[0..1]** | Another Location which this Location is physically part of. |
| telecom | Contact | **[0..1]** | The contact details of communication devices available at the location. This can include phone numbers, fax numbers, mobile numbers, email addresses and web sites. |

### ManufacturedProduct

Description of a product used in the care of a patient.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| expiry | dateTime | **[0..1]** | Date of expiry of this product (if applicable). |
| lotNumber | string | **[0..1]** | Lot number assigned by the manufacturer. |
| manufacturerName | string | **[0..1]** | Name of the manufacturer of the product |

### Medication

Primarily used for identification and definition of Medication, but also covers ingredients and packaging.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| code | CodeableConcept |  | A code (or set of codes) that identify this medication. Usage note: This could be a standard drug code such as a drug regulator code, RxNorm code, SNOMED CT code, etc. It could also be a local formulary code, optionally with translations to the standard drug codes. |
| form | CodeableConcept | **[0..1]** | Describes the form of the item. Powder; tables; carton. |
| ingredient | MedicationIngredient | **[0..\*]** | A constituent of interest in the medication product (e.g., sulfamethoxazole 800 mg) |
| isBrand | boolean | **[0..1]** | Set to true if the item is attributable to a specific manufacturer |

### MedicationIngredient

The composition of the medication.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| item | CodeableConcept |  | The actual ingredient item that makes up this medication. |
| strength | Quantity |  | How many (or how much) of the items there are in this Medication. E.g. 250 mg per tablet. |

### NutritionProduct

A manufactured item that is administered for a patient's nutrition

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| attribute | CodeableConcept | **[0..\*]** | A set of codes that define traits of the product, e.g., spicy food |
| type | CodeableConcept |  | A code that indicates the general classification of the product. This can be a class of products (e.g. Vegetables), a specific product (e.g. Broccoli). |

### Organization

A formally or informally recognized grouping of people or organizations formed for the purpose of achieving some form of collective action. Includes companies, institutions, corporations, departments, community groups, healthcare practice groups, etc.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| address | Address | **[0..1]** | The place or the name of the place where a organization is located or may be reached. |
| name | string | **[0..1]** | A name by which the organization is known. |
| telecom | Contact | **[0..1]** | A locatable resource of the organization such as a web page, a telephone number (voice, fax or some other resource mediated by telecommunication equipment), an e-mail address, or any other locatable resource. |
| type | CodeableConcept | **[0..1]** | The kind of organization that this is., e.g., hospital, long-term care facility, hospital department, government agency, educational institution. |

### Patient

Demographics and other administrative information about a person receiving care or other health-related services.

The data in the element covers the "who" information about the patient: it's attributes are focused on the demographic information necessary to support the administrative, financial and logistic procedures.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| isDeceased | boolean | **[0..1]** | Whether the patient is deceased. |
| maritalStatus | CodeableConcept | **[0..1]** | The patient's most recent marital (civil) status. |
| timeOfDeath | dateTime | **[0..1]** | The time when the patient died. |

### Person

Demographic and identification information for an individual.

Additional attributes to be added in future versions.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| address | Address | **[0..\*]** | The place or the name of the place where a person is located or may be reached. |
| birthTime | dateTime | **[0..1]** | The date and time of birth for the individual. |
| ethnicity | CodeableConcept | **[0..1]** | The person's ethnicity. An ethnicity or ethnic group is a group of people whose members identify with each other through a common heritage. E.g., Hispanic. |
| gender | CodeableConcept | **[0..1]** | Administrative Gender - the gender that the patient is considered to have for administration and record keeping purposes. |
| languages | CodeableConcept | **[0..\*]** | Languages which may be used to communicate with this person. |
| name | HumanName | **[0..1]** | A name by which the patient is known. |
| preferredLanguage | CodeableConcept | **[0..1]** | The person's language of preference. E.g., English. |
| race | CodeableConcept | **[0..1]** | The person's race. Race is a classification of humans into large groups by various factors, such as heritable phenotypic characteristics or geographic ancestry. E.g., White, Asian. |
| telecom | Contact | **[0..\*]** | A locatable resource of a person such as a web page, a telephone number (voice, fax or some other resource mediated by telecommunication equipment), an e-mail address, or any other locatable resource. |

### Practitioner

Demographics and qualification information for an individual who is directly or indirectly involved in the provisioning of healthcare.

Practitioner covers all individuals who are engaged in the healthcare process and healthcare-related services as part of their professional responsibilities. This class is used for attribution of activities and responsibilities to these individuals. Practitioners include (but are not limited to):

* physicians, dentists, pharmacists
* physician assistants, nurses, scribes
* midwives, dietitians, therapists, optometrists, paramedics
* medical technicians, laboratory scientists, prosthetic technicians, radiographers
* social workers, professional home carers, official volunteers
* receptionists handling patient registration
* IT personnel merging or unmerging patient records

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| organization | Organization | **[0..1]** | The organization that the practitioner represents. |
| qualification | Qualification | **[0..\*]** | Qualifications obtained by training and certification |
| role | CodeableConcept | **[0..\*]** | Roles which this practitioner is authorized perform for the organization. |
| speciality | CodeableConcept | **[0..\*]** | The professional specialty of the practitioner, e..g, cardiologist, midwife |

### Qualification

Qualifications obtained by training and certification.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| code | CodeableConcept | **[0..1]** | Coded representation of the qualification. |
| issuer | Organization | **[0..1]** | Organization that regulates and issues the qualification. |
| validityPeriod | Period | **[0..1]** | Period during which the qualification is valid |

### RelatedPerson

Information about a person that is involved in the care for a patient, but who is not the target of healthcare, nor has a professional responsibility in the care process.

RelatedPersons typically have a personal or non-healthcare-specific professional relationship to the patient. A RelatedPerson element is primarily used for attribution of information, since RelatedPersons are often a source of information about the patient. Example RelatedPersons are:

* A patient's wife or husband
* A patient's relatives or friends
* A neighbour bringing a patient to the hospital
* A patient's attorney or guardian

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| ageAtDeath | Quantity | **[0..1]** | The age of the related person at the time of their death. |
| isDeceased | boolean | **[0..1]** | Whether the patient is deceased. |
| relationship | CodeableConcept | **[0..1]** | The nature of the relationship between a patient and the related person. |

### Specimen

A sample of tissue, blood, urine, water, air, etc., taken for the purposes of diagnostic examination or evaluation.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| collectionMethod | CodeableConcept | **[0..1]** | The technique used to collect the specimen, e.g., aspiration, scraping |
| collectionSite | BodySite | **[0..1]** | Site from which the specimen was collected. |
| subject | Patient | **[0..1]** | The patient from whom the specimen was obtained. |
| type | CodeableConcept |  | The kind of material, e.g., blood, urine, tissue |

### Vaccine

Details about the vaccine product administered to the patient

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| vaccineType | CodeableConcept |  | The kind of vaccine that is or was or was not administered, e.g., DTaP, pertussis, influenze whole |

# core

Package: QUICK Class Model



## ClinicalStatement

A record of the occurrence (or non-occurrence, or unknown occurrence) of something of clinical relevance. A class that serves as the basis for other more specific clinical statements, such as a statement that an observation has occurred or that a procedure has not been proposed. It is a concrete class that can be specialized as needed.

Note that there are currently three types of clinical statements:

1. A StatementOfOccurrence which indicates that the topic of the statement has or will occur.

2. A StatementOfNonOccurrence which indicates that the topic of the statement has not or will not occur. Note that this statement is different from receiving an empty result set when searching for items of relevance. Given an open-world assumption, not returning results does not necessarily indicate that the event, fact, or action has not been asserted. Rather, a StatementOfNonOccurrence indicates that a person has made an explicit statement that the statement's topic did not occur.

3. A StatementOfUnknownOccurrence which represents an explicit statement that it is not known whether something has or will occur.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| additionalText | string | **[0..\*]** | Details about the clinical statement that were not represented at all or sufficiently in one of the attributes provided in a class. These may include for example a comment, an instruction, or a note associated with the statement. |
| encounter | StatementOfOccurrence | **[0..1]** | The encounter within which the clinical statement was created. |
| id | Identifier | **[0..1]** | A unique ID of this clinical statement for reference purposes. It must be provided if user wants it returned as part of any output, otherwise it will be auto-generated, if needed, by CDS system. Does not need to be the actual ID of the source system. |
| modality | StatementModality |  | The modality of a Clinical Statement describes the way the topic exists, happens, or is experienced. |
| profileId | Identifier | **[0..\*]** | The identifier of a set of constraints placed on a clinical statement. If there are multiple templates specified for the element, then the element must satisfy ALL constraints defined in ANY template at that level. |
| statementAuthor | Person | **[0..1]** | The person who created the statement.  The source and the author of the statement may differ. Statement source is the system from which the statement originated. This may be an EHR or it may be a medical device.  The statement author is the person creating the statement in the medical record. This may be a person who validates the data from a device, or obtains the history from a subject, a family member, or other source. |
| statementDateTime | dateTime | **[0..1]** | The time at which the statement was made/recorded. This may not be the same time as the occurrence of the action or the observation event. |
| statementSource | Entity | **[0..1]** | The person, device, or other system that was the source of this statement. |
| subject | Patient |  | The patient described by this statement. |
| topic | StatementTopic |  | The subject matter of this clinical statement. The topic may be an action like medication administration, or a finding or other observations about the patient. |

## StatementModality

The modality of a Clinical Statement describes the way the topic exists, happens, or is experienced.

## StatementOfNonOccurrence

A record of something of clinical relevance generally made by a patient, practitioner, or system stating that the statement's topic did not occur.

## StatementOfOccurrence

A record of something of clinical relevance generally made by a patient, practitioner, or system stating the occurrence of the statement's topic.

## StatementOfUnknownOccurrence

A record of something of clinical relevance generally made by a patient, practitioner, or system stating that it is not known that the statement's topic has occurred.

## StatementTopic

The topic of a clinical statement. Generally statement topics fall into two broad categories: (1) statements about things that are observed (e.g., a clinical observation such as elevated blood pressure or a condition such as diabetes) and (2) statements about clinical actions that ought to be, may have been, have been, or will be done (e.g., a proposal for an imaging procedure or the performance of an angioplasty).

# datatypes

Package: QUICK Class Model

Please see http://hl7.org/implement/standards/fhir/datatypes.html for documentation of the datatypes.









## Address

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| city | string | **[0..1]** |  |
| country | string | **[0..1]** |  |
| line | string | **[0..\*]** |  |
| period | Period | **[0..1]** |  |
| state | string | **[0..1]** |  |
| text | string | **[0..1]** |  |
| use | code | **[0..1]** |  |
| zip | string | **[0..1]** |  |

## Age

## Attachment

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| contentType | code |  |  |
| data | base64Binary | **[0..1]** |  |
| hash | base64Binary | **[0..1]** |  |
| language | code | **[0..1]** |  |
| size | integer | **[0..1]** |  |
| title | string | **[0..1]** |  |
| url | uri | **[0..1]** |  |

## CodeableConcept

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| coding | Coding | **[0..\*]** |  |
| text | string | **[0..1]** |  |

## Coding

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| code | code | **[0..1]** |  |
| display | string | **[0..1]** |  |
| primary | boolean | **[0..1]** |  |
| system | uri | **[0..1]** |  |
| valueSet | uri | **[0..1]** |  |
| version | string | **[0..1]** |  |

## Contact

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| period | Period | **[0..1]** |  |
| system | code | **[0..1]** |  |
| use | code | **[0..1]** |  |
| value | string | **[0..1]** |  |

## Count

## Distance

## Duration

## Element

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| extension | Extension | **[0..\*]** |  |
| id | uri-primitive |  |  |

## Extension

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| url | uri-primitive |  |  |

## HumanName

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| family | string | **[0..\*]** |  |
| given | string | **[0..\*]** |  |
| period | Period | **[0..1]** |  |
| prefix | string | **[0..\*]** |  |
| suffix | string | **[0..\*]** |  |
| text | string | **[0..1]** |  |
| use | code | **[0..1]** |  |

## Identifier

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| id | string | **[0..1]** |  |
| system | uri | **[0..1]** |  |

## Money

## Period

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| end | dateTime | **[0..1]** |  |
| start | dateTime | **[0..1]** |  |

## Quantity

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| code | code | **[0..1]** |  |
| comparator | code | **[0..1]** |  |
| system | uri | **[0..1]** |  |
| units | string | **[0..1]** |  |
| value | decimal | **[0..1]** |  |

## Range

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| high | Quantity | **[0..1]** |  |
| low | Quantity | **[0..1]** |  |

## Ratio

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| denominator | Quantity | **[0..1]** |  |
| numerator | Quantity | **[0..1]** |  |

## Repeat

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| count | integer | **[0..1]** |  |
| duration | decimal |  |  |
| end | dateTime | **[0..1]** |  |
| frequency | integer | **[0..1]** |  |
| units | code |  |  |
| when | code | **[0..1]** |  |

## ResourceReference

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| display | string | **[0..1]** |  |
| reference | string | **[0..1]** |  |

## SampledData

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| data | string |  |  |
| dimensions | integer |  |  |
| factor | decimal |  |  |
| lowerLimit | decimal | **[0..1]** |  |
| origin | Quantity |  |  |
| period | decimal |  |  |
| upperLimit | decimal | **[0..1]** |  |

## Schedule

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| event | Period | **[0..\*]** |  |
| repeat | Repeat | **[0..1]** |  |

## Structure

## Type

## base64Binary

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| value | base64Binary-primitive | **[0..1]** |  |

## base64Binary-primitive

## boolean

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| value | boolean-primitive | **[0..1]** |  |

## boolean-primitive

## code

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| value | code-primitive |  |  |

## code-primitive

## date

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| value | date-primitive | **[0..1]** |  |

## date-primitive

## date-union

Fhir Date Union of gYear, gYearMonth, date

## dateTime

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| value | dateTime-primitive | **[0..1]** |  |

## dateTime-primitive

## dateTime-union

Fhir DateTime Union of gYear, gYearMonth, dateTime, date

## decimal

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| value | decimal-primitive | **[0..1]** |  |

## decimal-primitive

## extension-choice

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| valueAddress | Address |  |  |
| valueAttachment | Attachment |  |  |
| valueBase64Binary | base64Binary |  |  |
| valueBoolean | boolean |  |  |
| valueCode | code |  |  |
| valueCodeableConcept | CodeableConcept |  |  |
| valueCoding | Coding |  |  |
| valueContact | Contact |  |  |
| valueDate | date |  |  |
| valueDateTime | dateTime |  |  |
| valueDecimal | decimal |  |  |
| valueHumanName | HumanName |  |  |
| valueIdentifier | Identifier |  |  |
| valueInstant | instant |  |  |
| valueInteger | integer |  |  |
| valuePeriod | Period |  |  |
| valueQuantity | Quantity |  |  |
| valueRange | Range |  |  |
| valueRatio | Ratio |  |  |
| valueResource | ResourceReference |  |  |
| valueSampledData | SampledData |  |  |
| valueSchedule | Schedule |  |  |
| valueString | string |  |  |
| valueUri | uri |  |  |

## id

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| value | id-primitive |  |  |

## id-primitive

## instant

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| value | dateTime-primitive | **[0..1]** |  |

## instant-primitive

## integer

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| value | integer-primitive | **[0..1]** |  |

## integer-primitive

## oid

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| value | oid-primitive |  |  |

## oid-primitive

## string

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| value | string-primitive | **[0..1]** |  |

## string-primitive

## uri

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| value | uri-primitive | **[0..1]** |  |

## uri-primitive

## uuid

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| value | uuid-primitive |  |  |

## uuid-primitive

# observable

Package: QUICK Class Model







## AdverseReaction

An adverse event caused by exposure to some agent (e.g., a medication, immunization, food, or environmental agent).

An adverse reaction can range from a mild reaction, such as a harmless rash to a severe and life-threatening condition. They can occur immediately or develop over time. For example, a patient may develop a rash after taking a particular medication.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| exposure | Exposure | **[0..\*]** | Exposure to an action that is presumed to have caused the action |

## AllergyIntolerance

A description of an undesirable physiologic or other reaction to an external stimulus.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| criticality | CodeableConcept | **[0..1]** | The potential seriousness of a future reaction. This represents a clinical judgment about the worst case scenario for a future reaction. It would be based on the severity of past reactions, the strength of the stimulus (e.g., the dose and route of exposure) that produced past reactions, and the life-threatening or organ system threatening potential of the reaction type. |
| effectiveTime | Period | **[0..1]** | The time period during which the allergy or intolerance is effective. |
| reaction | CodeableConcept | **[0..\*]** | The possible reactions to the stimulus, e.g., respiratory distress. |
| sensitivityType | CodeableConcept |  | A code that indicates whether this sensitivity is of an allergic nature or an intolerance to a stimulus. |
| stimulus | CodeableConcept |  | The stimulus that causes the undesirable effect, or when a non-allergy is being specified, the stimulus that does not lead to an undesirable effect.  The stimulus may be a substance (amount of a substance that would not produce a reaction in most individuals) or other agents, e.g., a signal, confined space.  A substance is a physical entity and for purposes of this aspect of the model can mean a drug or biologic, food, chemical agent, plants, animals, plastics etc. |

## CareExperience

Information collected from a consumer, patient, or family member about their perception of the care they received or from a care giver about the care provided. Information collected includes the elements of care coordination, communication, whole-person approach to care, access to care, timeliness of care, and information sharing. Experience also encompasses the patient’s outcomes with respect to care provided in the past. For example, a patient receiving chemotherapy who has not responded to first line medication treatment or who no longer responds to such therapy may require second tier treatment. Such a patient’s experience of care is an important factor in defining subsequent treatment which can be driven by patient preference.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| about | ClinicalStatement |  | The statement (e.g., encounter, procedure) that is the basis for the experience |
| experience | CodeableConcept |  | The actual experience, e.g., poor communication. |

## Condition

Use to record detailed information about conditions, problems or diagnoses recognized by a clinician. There are many uses including: recording a Diagnosis during an Encounter; populating a problem List or a Summary Statement, such as a Discharge Summary.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| ageAtOnset | Range | **[0..1]** | The subject's age when the problem began. |
| category | CodeableConcept | **[0..1]** | A category assigned to the condition. E.g. finding | diagnosis | concern | symptom. |
| certainty | CodeableConcept | **[0..1]** | The degree of confidence that this condition is correctly identifed |
| code | CodeableConcept |  | Identification of the condition, problem or diagnosis. e.g., diabetes mellitus type II, headache. |
| conditionQualifier | Qualifier | **[0..\*]** | The qualifier allow specifying more details about the condition. e.g., severity, triggering factors, stage.  Qualifiers should not change the meaning of the condition other than making the condition more specific (i.e., they are not modifiers). |
| contributionToDeath | CodeableConcept | **[0..1]** | Whether the problem was the cause or contributor to the subject's death. |
| criticality | CodeableConcept | **[0..1]** | Characterizes impact of condition on life, or durable impact on physiological function or on quality of life. Includes concepts such as life-threatening, or potential loss of function or capacity. E.g., Life threatening, potentially requires hospitalization, self-resolving. Different from severity in that a moderate subarachnoid hemorrhage is likely to be highly important, whereas a moderate headache is not as important. |
| effectiveTime | Period | **[0..1]** | The time period during which the condition is effective. The represents both the onset date and the date of abatement. |
| location | BodySite | **[0..\*]** | Indicates the location of the condition on the subject's body. |
| severity | CodeableConcept | **[0..1]** | A subjective assessment of the severity of the condition as evaluated by the clinician. |
| status | code |  | The state of the condition at the time of the observation, e.g., active, inactive.  (see http://hl7.org/fhir/condition-status for values) |

## Contraindication

Describes a contraindication to a healthcare related action, e.g., medication intake, procedure.

A contraindication is a specific situation in which a drug, procedure, or surgery should not be used because it may be harmful to the patient, due to the presence of other conditions (e.g., kidney dysfunction) or some other acts (e.g., another medication)

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| contraindicatedAct | Act |  | The action that is to be withheld in the context of the contraindication. Note that a contraindication may apply to the administration of a substance or to the performance of a procedure, for instance. |
| degree | CodeableConcept | **[0..1]** | The degree or strength of the contraindication; may be absolute or relative.  An absolute contraindication means that the course of action MUST be avoided.  A relative contraindication means that the course of action SHOULD be avoided but that the risk of proceeding with the course of action may be outweighed by other factors or mitigated in some way. |
| effectiveTime | Period | **[0..1]** | The time period during which the contraindication holds. This may be an open interval if no end time is currently known. |
| inference | Inference | **[0..1]** | How the conclusion was made about the act being contraindicated, i.e., the underlying patient conditions and the method used for inferring. |

## Exposure

Exposure to an agent or a healthcare action that is believed to have consequences.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| action | StatementOfOccurrence | **[0..1]** | Reference to an action believed to have caused the adverse event. |
| causalityExpectation | CodeableConcept | **[0..1]** | The degree of certainty in whether the exposure caused the event |
| exposureTime | Period | **[0..1]** | When the exposure occurred |
| stimulus | CodeableConcept | **[0..1]** | The stimulus, an agent or a type of action that may have caused the event. |

## FamilyHistory

Significant health event or condition for people related to the subject, relevant in the context of care for the subject.

This information can be known to different levels of accuracy. Sometimes the exact condition ('asthma') is known, and sometimes it is less precise ('some sort of cancer'). Equally, sometimes the person can be identified ('my aunt agatha') and sometimes all that is known is that the person was an uncle.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| condition | CodeableConcept |  | Condition that the related person had. |
| onsetAge | Quantity | **[0..1]** | When condition first manifested |
| outcome | CodeableConcept | **[0..1]** | Indicates what happened as a result of this condition. e.g., deceased, permanent disability. |
| subject | RelatedPerson |  | The person, related to the patient, who is affected by the condition. |

## Inference

An inference made, about the patient's health, from other statements.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| inferenceMethod | CodeableConcept | **[0..1]** | The algorithm, tool, or instrument used to make the inference. E.g., Framingham Risk Score, Immunization Rule Set. |
| inferredFrom | ClinicalStatement | **[0..\*]** | The statements that form the basis for the inference. E.g., diagnosis of diabetes mellitus, and blood pressure observations to calculate risk of heart disease. |

## ManifestedSymptom

The signs and symptoms that were observed as part of the event.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| bodySite | BodySite | **[0..1]** | The body site of the symptom or sign |
| criticality | CodeableConcept | **[0..1]** | Characterizes impact on life, or durable impact on physiological function or on quality of life. Includes concepts such as life-threatening, or potential loss of function or capacity. E.g., Life threatening, potentially requires hospitalization, self-resolving. Different from severity in that a moderate subarachnoid hemorrhage is likely to be highly important, whereas a moderate headache is not. |
| severity | CodeableConcept | **[0..1]** | Characterizes the intensity of the manifestation of the sign or symptom. Includes concepts such as mild, moderate, severe. If the symptom is rash and severity is moderate, it means that the symptom was a moderate rash. |
| symptomCode | CodeableConcept |  | The specific sign or symptom that was observed. |

## MicrobiologySensitivityResult

Findings of the microbiology sensitivity test. This element is used to specify traditional, culture-isolate- run susceptibilities. It is not used to specify genetic methods for organism sensitivity.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| organismSensitivity | OrganismSensitivity | **[0..\*]** | Components of the microbiology sensitivity result. Each of the OrganismSensitivity items represent a the sensitivity of an organism to one agent. |

## Observable

The outcome of medical investigations or diagnostics. "*Clinical findings*" are the observations made during the history and physical.

## ObservationResult

Measurements and simple assertions made about a patient.

Simple observation results may include:

Individual laboratory test results: WBC count, urine albumin 24 hour

Vital signs: temperature, blood pressure, respiration rate

Measurements acquired using devices

Personal characteristics: height, weight, eye-color

Social history: tobacco use, family supports, cognitive status

Core characteristics: blood type

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| value | Element | **[0..1]** | The information determined as a result of making the observation. e.g., 120 mm Hg, small, 2013-11-30 |

## ObservationResultBase

Assertions and measurements made about a patient, device or other subject.

ObservationResults are a central element in healthcare, used to support diagnosis, monitor progress, determine baselines and patterns and even capture demographic characteristics. Fundamentally, observations are name/value pair assertions. Simple observation values, such a body temperature, are specified in the value attribute. Richer values, e.g., result panels, aggregate observations from diagnostic imaging, and microbiology sensitivity results, are specified in the detailedResult attribute.,

This data type does not support the storage of the image or signal sequences such as electrocardiogram data. However, the observations and interpretation made from the images and signals can be represented here.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| bodySite | BodySite | **[0..1]** | Indicates where on the subject's body the observation was made. |
| interpretation | CodeableConcept | **[0..1]** | The assessment made based on the result of the observation. |
| method | CodeableConcept | **[0..1]** | The technique or mechanism used to perform the observation. |
| name | CodeableConcept |  | Identifies what type of observation was performed. e.g., body temperature |
| order | StatementOfOccurrence | **[0..1]** | An order placed by a provider that led to this observation result |
| relatedObservation | RelatedObservation | **[0..\*]** | Observations related to this observation in some way, e.g., used to derive this observation, previous versions of this observation.  Related observations do not include components. Those are modeled in ObservationResultGroup. |
| reliability | CodeableConcept | **[0..1]** | An estimate of the degree to which quality issues have impacted on the value reported. e.g., result is ok, measurement still ongoing, results are questionable. Usually, unreliable results are not recorded, but that is not always possible. In such cases, this attribute makes the receiver aware of the quality of the result. |
| specimen | Specimen | **[0..1]** | The specimen that was used when this observation was made.  Observations are not made on specimens themselves; they are made on a subject, but usually by the means of a specimen. Note that although specimens are often involved, they are not always tracked and reported explicitly. Also note that observation resources are often used in contexts that track the specimen explicity (e.g. Diagnostic Report). |
| status | CodeableConcept | **[0..1]** | The status of the result value. e.g., preliminary, final |
| validationMethod | CodeableConcept | **[0..1]** | Method by which the observation result was validated, e.g., human review, sliding average. |

## ObservationResultGroup

A group of related result values such as a laboratory result panel. e.g., complete blood count, blood pressure

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| component | ObservationResultBase | **[0..\*]** | An observation result that is one of the components of the group, e.g., systolic blood pressure, white blood cell count. |

## OrganismSensitivity

Sensitivity of an organism to a specified antimicrobial agent

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| antiMicrobialAgent | CodeableConcept |  | The antimicrobial agent that was tested for sensitivity, e.g., vancomycin |
| organism | CodeableConcept |  | The microorganism whose sensitivity is being tested. |
| sensitivity | CodeableConcept |  | The response of the microorgranism to the agent. For example, resistant, susceptible. |

## Prediction

Concept representing the likely course of an existing disease or condition or the likelihood (risk) of acquiring a condition that is not currently manifested.

This class represents desirable and undesirable courses.

Examples: 5 year survival, 10-year risk of heart disease, likelihood to recover lower limb neuromuscular function after spinal cord injury

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| condition | StatementOfOccurrence | **[0..1]** | For assessments or prognosis specific to a particular condition, indicates the condition being assessed |
| inference | Inference | **[0..1]** | How the prognosis was estimated or inferred. |
| likelihood | Element | **[0..1]** | The likelihood of acquiring the condition specified as a numeric probability (less than or equal to 1) or a coded ordinal value. |
| outcome | CodeableConcept |  | The outcomes that is being predicted for the patient (e.g. remission, death, a particular condition). |
| riskAssessmentProcedure | StatementOfOccurrence | **[0..1]** | The risk assessment procedure that led to this prognosis |
| timePeriod | Period | **[0..1]** | The time span within which the condition will be reached. e.g., 10 years. |

## Qualifier

Further qualifies the concept it modifies. For instance, when associated with a condition, a qualifier may describe the intensity of pain or the criticality of the condition.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| property | CodeableConcept |  | What detail about the condition is being specified. e.g.., intensity of the pain condition |
| value | Element |  | The value of this detail property, e.g., mild, severe for the value of pain intensity |

## RelatedObservation

A class enabling relationships to be specified between two statements about ObservationResults.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| relationshipType | CodeableConcept |  | The kind of relationship that exists with the target observation. |
| target | StatementOfOccurrence |  | The observation that is related to this observation. |

## modality

Package: observable

### Observation

Indicates that the statement is concerned about observations made about a patient.

Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Multiplicity** | **Notes** |
| observedAtTime | Period | **[0..1]** | Time when the observation was made by the statement author. This may be different than the time the observation was physically recorded (which may occur much later). This also is different time than when the observed phenomenon actually occurred. For example, a patient had a headache three days ago, but reported it to their physician today. The physician would record the observedAtTime as today. |

# statement

Package: QUICK Class Model

This package contains a partial set of concrete clinical statements. Please see the html documentation (flattened version) for the full set of attributes provided these statements (via classes the statements implement).

The description of each clinical statement includes one or more examples. Since terminology binding has not been performed yet, the value sets and codes used in the examples are made up.



















## CommunicationPerformanceOccurrence

A communication event that is occurring or has occurred. E.g., an alert that was sent, a Direct message that was sent.

**Example**

Expression from source knowledge artifact

Communication from patient to provider: Previous receipt of influenza vaccine

Expression in CQL+QUICK

let FluVaccCommunication =

[Communication, Performance] C where

C.sender is Patient

and

exists (C.recipeint R where R is Practioner)

and

exists (C.relatedStatement Imm where

Imm is ImmunizationPerformanceOccurrence

and (Imm as ImmunizationPerformanceOccurrence).vaccine.vaccineType in "Influenza Vaccine Value Set"

)

## CommunicationProposalOccurrence

An occurrence of a proposal to communicate. E.g., the CDS system proposes that an alert be sent to a responsible provider, the CDS system proposes that the public health agency be notified about a reportable condition.

**Example**

Expression from source knowledge artifact

Notify San Diego County Department of Health and Human Services about case of Pertussis

Expression in CQL+QUICK

let PertussisNotificationSD =

[Communication, Proposal] N where

N.recipient is Organization

and

(N.recipient as Organization).name = "San Diego County Department of Health and Human Services"

and

exists (C.relatedStatement P where

P is ConditionOccurrence

and (P as ConditionOccurrence).code in "Pertussis Diagnosis Value Set"

)

## ConditionOccurrence

A statement about a condition that the patient has or is believed to have had.

**Example**

Expression from source knowledge artifact

Diagnosis, Active: Acute Myocardial Infarction" <= 12 month(s) starts before start of "Measurement Period" using "Acute Myocardial Infarction Grouping Value Set

Expression in CQL+QUICK

let AMICondition =

[Condition: "Acute Myocardial Infarction Grouping ValueSet"] AMI

where effectiveTime starts at most 12 months before start MeasurementPeriod

## DeviceUseOrderOccurrence

A provider's order to dispense and use a medical device.

**Example**

Expression from source knowledge artifact

Begin NTP (Non-Invasive Transcutaneous Pacing) immediately

Expression in CQL+QUICK

let NTPOrder =

[DeviceUse, Order: "Non-Invasive Transcutaneous Pacing"] N where

N.urgency in "Urgent Action Value Set"

## DeviceUsePerformanceOccurrence

The provision of the device to the patient and their use of the device.

**Example**

Expression from source knowledge artifact

Device, Applied: Hospital Measures-Indwelling urinary catheter

Expression in CQL+QUICK

let UsedIndwellingCath =

[DeviceUse, Performance: "Hospital Measures-Indwelling urinary catheter"]

## DeviceUseProposalOccurrence

Proposal, e.g., by a CDS system, for the specified device to be used.

**Example**

Expression from source knowledge artifact

Use of CPAP is proposed (for patient with sleep apnea)

Expression in CQL+QUICK

let CPAPProposal =

[DeviceUse, Proposal: "CPAP"]

## DiagnosticImagingOrderOccurrence

An order for an imaging procedure to be performed on a patient.

**Example**

Expression from source knowledge artifact

"CT Scan of Lower Spine" ordered <= 28 day(s) after start of "Occurrence A of Diagnosis, Active: Low Back Pain"

Expression in CQL+QUICK

let CTSpineOrder =

[DiagnosticImaging, Order: "CT Scan of Lower Spine"] CT with

[Condition: "Low Back Pain"] LBP where

CT.orderTime starts at most 28 days after start LBP.effectiveTime

## DiagnosticImagingPerformanceOccurrence

The performance of an imaging procedure on a patient.

**Example**

Expression from source knowledge artifact

"Diagnostic Study, Performed: CT Scan of Lower Spine" <= 28 day(s) starts after start of "Occurrence A of Diagnosis, Active: Low Back Pain"

Expression in CQL+QUICK

let CTSpinePerformance =

[DiagnosticImaging, Performance: "CT Scan of Lower Spine"] CT with

[Condition: "Low Back Pain"] LBP where

CT.performanceTime starts at most 28 days after start LBP.effectiveTime

## DiagnosticImagingProposalOccurrence

Proposal for an imaging procedure to take place, e.g., generated by a CDS system or by a consulting clinician.

**Example**

Expression from source knowledge artifact

CT Scan of Lower Spine" proposed <= 28 day(s) after start of "Occurrence A of Diagnosis, Active: Low Back Pain"

Expression in CQL+QUICK

let CTSpineProposal =

[DiagnosticImaging, Proposal: "CT Scan of Lower Spine"] CT with

[Condition: "Low Back Pain"] LBP where

CT.proposedAtTime starts at most 28 days after start LBP.effectiveTime

## EncounterPerformanceOccurrence

The record of an interaction that has occurred or is occurring between a subject and the healthcare system.

**Example**

Expression from source knowledge artifact

Encounter, Performed: Care Services in Long-Term Residential Facility during Measurement Period

Expression in CQL+QUICK

let LTRFEnc =

[Encounter, Performance] E

where

E.location.type in "Long-Term Residential Facility Value Set"

and

E.performanceTime overlaps MeasurementPeriod

## EncounterProposalOccurrence

An occurrence of a proposal for an encounter to take place between a patient and a provider, e.g., a proposed referral, a proposed hospitalization.

**Example**

Expression from source knowledge artifact

Refer patient for a consult to nutrition services for weight loss

Expression in CQL+QUICK

let NutrRef =

[Encounter, Proposal] E

where

serviceType in "Consult"

and

indication[1].reason in "Weight Loss"

## MedicationTreatmentOrderOccurrence

An order for both supply of the medication and the instructions for administration of the medicine to a patient.

**Example**

Expression from source knowledge artifact

Ticagrelor, 180 mg loading dose by mouth once, 90 mg by mouth twice daily

Expression in CQL+QUICK

let TicagrelorOrder =

[MedicationTreatment, Order: "Ticagrelor"] T where

exists (

T.dosage LD where

IsEquivalent(LD.doseType, LoadingDoseCode)

and

LD.doseQuantity = 180 u 'mg'

and

IsEquivalent(LD.route, OralRouteCode)

and

((LD.administrationFrequency.cycle.cycleTiming as AnchoredEvent).pointInCycle = 1 days)

and

IsEquivalent(((LD.administrationFrequency.cycle.cycleTiming as AnchoredEvent).cycle[1].cycleTiming as CodedRecurringEvent).repeatCode, OncePerDayCode)

)

and

exists (

T.dosage LD where

IsEquivalent(LD.doseType, MaintenanceDoseCode)

and

LD.doseQuantity = 90 u 'mg'

and

IsEquivalent(LD.route, OralRouteCode)

and

((LD.administrationFrequency.cycle.cycleTiming as AnchoredEvent).pointInCycle = 2 days)

and

IsEquivalent(((LD.administrationFrequency.cycle.cycleTiming as AnchoredEvent).cycle[1].cycleTiming as CodedRecurringEvent).repeatCode, TwicePerDayCode)

)

## MedicationTreatmentPerformanceOccurrence

The performance of a medication treatment action. This statement can describes the action of administering one dose, administering a course of medication, or the dispensing of medication. The attribute actionPerformed (in Performance) can distinguish these variants of the statement.

**Example 1**

Expression from source knowledge artifact

"Medication, Administered: Hospital measures-IV Vancomycin (route: "Hospital measures-Route IV")"

Expression in CQL+QUICK

let VancoDoseAdmin =

[MedicationTreatment, Performance: "Hospital measures-IV Vancomycin"] V

where

dosage[1].route in "Hospital measures-Route IV"

and IsEquivalent(actionPerformed, DoseAdministrationActionCode)

**Example 2**

Expression from source knowledge artifact

Medication dispensed: Medications indicative of diabetes

Expression in CQL+QUICK

let DiabetesMedsDispensed =

[MedicationTreatment, Performance: "Medications indicative of diabetes"] M

where

IsEquivalent(actionPerformed, MedicationDispensedActionCode)

## MedicationTreatmentProposalOccurrence

An proposal to supply and/or administer a medication to a patient.

**Example**

Expression from source knowledge artifact

Aspirin 81 mg ,one tablet per day orally was proposed

Expression in CQL+QUICK

let AspirinProposal =

[MedicationTreatment, Proposal: "Aspirin"] A where

dosage[1].doseQuantity = 81 u 'mg'

and

IsEquivalent(dosage[1].route, OralRouteCode)

and

IsEquivalent((dosage[1].administrationFrequency.cycle.cycleTiming as CodedRecurringEvent).repeatCode, OncePerDayCode)

## ObservationResultGroupOccurrence

An observation result instance that groups together results of other observations. Used for laboratory test panels and compound observations such as blood pressure (that contain a systolic and diastolic pressure value).

**Example**

Expression from source knowledge artifact

A CBC test result that was resulted in the last 2 days

Expression in CQL+QUICK

let RecentCBC =

[ObservationResultGroup: "Complete Blood Count"] CBC

where CBC.observedAtTime starts during interval[Today, Today - 2 days]

## PredictionOccurrence

A statement forecasting the course or probable outcome of a condition in a specified time period, e.g., recovery of function after a spinal cord injury, risk of heart disease in the next 10 years, survival from cancer.

**Example**

Expression from source knowledge artifact

Risk Category Assessment: Framingham coronary heart disease 10 year risk (result > 20 %)" during "Measurement Period

Expression in CQL+QUICK

let FraminghamScore =

[Prediction: "Framingham Score"] FSP

where

FSP.likelihood > 20 u '%'

and

FSP.observedAtTime during MeasurementPeriod

and

duration in years of FSP.timePeriod = 10 years

## ProcedureOrderOccurrence

An order for a procedure to be performed.

**Example**

Expression from source knowledge artifact

Glucose by finger stick screening 4 times daily for 24 hours

Expression in CQL+QUICK

let FSOrder =

[Procedure, Order: "Finger Stick Screening "] Gluc

where IsEquivalent((procedureSchedule.administrationFrequency.cycle.cycleTiming as CodedRecurringEvent).repeatCode, FourTimesPerDayCode)

and

procedureSchedule.administrationFrequency.cycle.cycleLength = 1 days

## ProcedurePerformanceOccurrence

The actual event of performing a procedure.

**Example**

Expression from source knowledge artifact

Screen for syphilis infections

Expression in CQL+QUICK

let PCIEvent =

[Procedure, Performance: "Percutaneous Coronary Intervention"] PCI

where performanceTime starts at most 12 months before start MeasurementPeriod

## ProcedureProposalOccurrence

A proposal for a procedure to take place, e.g., generated by a CDS system or by a consulting clinician.

**Example**

Expression from source knowledge artifact

Screen for syphilis infections

Expression in CQL+QUICK

let SyphScreen =

[Procedure, Proposal: "Screening Test for Syphillis"]

## SimpleObservationOccurrence

An observation result that reports the value of a single observation, e.g., pulse rate, serum sodium result.

**Example**

Expression from source knowledge artifact

"Physical Exam, Finding: Systolic Blood Pressure (result < 140 mmHg)" during MOST RECENT: "Encounter, Performed: Office Visit"

Expression in CQL+QUICK

let MostRecentOfficeVisit =

Last([Encounter, Performance: "Office Visit"] E sort by E.effectiveTime)

let LastBPNormal =

[SimpleObservationResult: "Systolic Blood Pressure"] SBP

with MostRecentOfficeVisit OV

where SBP.observedAtTime during OV.performanceTime

where SBP.value < 140 u'mm[Hg]'