# Examples of medication prescriptions using Medication order archetype and associated cluster archetypes

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## Introduction

Medication ordering/prescribing can be highly complex, particularly the combination of dose amounts and timing.

This document contains a number of worked examples which should help inform intended use of the medication order archetype and associated cluster archetypes.

The key archetypes used in the construction of medication orders are …

Medication order: <http://openehr.org/ckm/#showArchetype_1013.1.1445>

Medication substance: <http://openehr.org/ckm/#showArchetype_1013.1.2368>

Timing - daily: <http://openehr.org/ckm/#showArchetype_1013.1.2245>

Timing - repetition: <http://openehr.org/ckm/#showArchetype_1013.1.2246>

Other cluster archetypes are generally required e.g. Authorisation, dispensing details but these are omitted in these examples for clarity.

An example template which makes use of these archetypes can be viewed at

ePrescription (FHIR): <http://openehr.org/ckm/#showTemplate_1013.26.80>

The following mindmap outlines the combination of Medication order archetype with its Cluster components, as used in the examples …

Overview of Medication order and related cluster archetypes.



### Use of terminology

Terminology is omitted for clarity but it would be expected in most examples, the 'Medication item' would be coded using a reference medication terminology such as RxNorm, dm+d, AMT etc.

### Dose and Product-based prescribing

Examples are given for both dose-based and product-based prescribing.

### Dose-based prescribing

The drug name (Medication item) is expressed as a chemical agent and the dose amount is generally expressed as an SI unit. Route is generally specified rather than form.

e.g. Atenolol - oral - 40mg twice daily

### Product-based prescribing

The drug name (Medication item) is expressed as a specific manufactured product (generic or otherwise) and the dose is generally expressed as a dose unit - tablets, capsules, drops, puffs. Form is generally not specified since it is carried in the product name

e.g. Atenolol 40mg tabs - 1 tablet twice daily

### Parsable dose syntax examples

Most examples define an equivalent 'parsable dose syntax' intended to carry a subset of dose amount and timing details, appropriate for transferring information between disparate systems. The examples shown are derived from a [dose syntax developed by NHS Scotland](http://www.scimp.scot.nhs.uk/wp-content/uploads/NHS-Dose-Syntax-Recommendations-April-2015.pdf).

**Note that this syntax has no official status within openEHR and is shown here purely as an example.**

## A. Simple dose-based medication order

Atenolol 40mg one tablet in the morning, indefinitely

Medication order

Medication item: Atenolol 40mg tabs

Parsable dose directions: "1 m"

Dose direction..

Direction sequence: 0

Dose pattern..

Pattern sequence: 0

Dose amount: 1

Dose unit: tablet

Timing - daily..

Named time event: in the morning

Direction duration: Indefinitely

## B. Simple product-based medication order

Atenolol 40mg one tablet in the morning for 4 weeks

Medication order

Medication item: Atenolol

Route: oral

Parsable dose directions: "40mg m"

Dose direction..

Dose pattern..

Dose amount: 40

Dose unit: mg

Timing - daily..

Named time event: in the morning

Direction duration: 4 weeks

## C. 'As required' order with an 'up to' interval timing and a maximal daily dose

Paracetamol liquid oral 125mg/5ml 5-10ml up to every 4-6 hours as required for pain or fever; maximum 40ml in 24hrs

Medication order

Medication item: Paracetamol liquid 125mg/5ml

Route: oral

Parsable dose directions: "5-10ml ^4h/6h prn [40ml h24]"

Dose direction..

Dose pattern..

Dose amount: 5-10

Dose unit: ml

Timing - daily..

Interval: <= 4-6 hours

As required: True

As required criterion: "for pain or fever"

Medication safety..

Maximum dose..

Maximum amount: 40

Maximum amount dose unit: ml

Allowed period: 24 hours

### Notes

The 'up to' aspect of the dose interval is carried in the magnitude\_status attribute of the DV\_QUANTITY datatype of the openEHR reference model.

## D. Tapered dose-based prescribing order

Enalapril -oral- 2.5mg once daily for 1 day, then 5mg once daily for 7 days, then 5 mg at 6pm and 10mg at 10pm, indefinitely

Medication order..

Medication item: Enalapril

Route: oral

Parsable dose directions: "2.5mg od:1d ;5mg od:7d ;5mg @1800 & 10mg @2200 :ind"

Dose direction..

Direction sequence: 0

Dose pattern..

Dose amount: 2.5

Dose unit: mg

Timing - daily..

Frequency: 1/day

Direction duration: 1 day

Dose direction..

Direction sequence: 1

Dose pattern..

Dose amount: 5

Dose unit: mg

Timing - daily..

Frequency: 1/day

Direction duration: 1 day

Dose direction..

Direction sequence: 2

Dose pattern..

Pattern sequence: 0

Dose amount: 5

Dose unit: mg

Timing - daily..

Specific time: 1800

Dose pattern..

Pattern sequence: 1

Dose amount: 10

Dose unit: mg

Timing - daily..

Specific time: 2200

Direction duration: indefinitely

Additional instruction: Avoid grapefruit

## D. Tapered product-based prescribing order

Enalapril 2.5mg tablets; 1 tab at night for 2 days, then 1 tab morning and night for 5 days, then 4 tabs at night, indefinitely

Medication order..

Medication item: Enalapril 2.5mg tablet

Parsable dose directions: "1 n:2d ;1 m+n:5d ; 4 n:ind"

Dose direction..

Direction sequence: 0

Dose pattern..

Dose amount: 1

Dose unit: tab

Timing - daily..

Named time event: in the morning

Direction duration: 2 day

Dose direction..

Direction sequence: 1

Dose pattern..

Dose amount: 1

Dose unit: tab

Timing - daily..

Named time event: in the morning

Named time event: at night

Direction duration: 5 day

Dose direction..

Direction sequence: 2

Dose pattern..

Dose amount: 4

Dose unit: tab

Timing - daily..

Named time event: at night

Direction duration: indefinitely

Additional instruction: Avoid grapefruit

## E. Complex dose-based order with multiple dose patterns

Gabapentin – oral - 300mg at night for one day, then 300mg in the morning and at night for one day, then 300mg three times a day for one day, then 300mg in the morning, 300mg in the afternoon and 600mg at night for 4 days, then 600mg in the morning, 300mg in the afternoon and 600mg at night for 1 day, then 600mg three times a day indefinitely.

Medication order..

Medication item: Gabapentin

Route: oral

Parsable dose directions: 300mg n:1d;300mg m+n:1d;300mg td:1d;300mg m+pm&600mg n:4d;600mg m&300mg a&600mg n;600mg td:ind"

Dose direction..

Direction sequence: 0

Dose pattern..

Dose amount: 300

Dose unit: mg

Timing - daily..

Named time event: at night

Direction duration: 1 day

Dose direction..

Direction sequence: 1

Dose pattern..

Dose amount: 300

Dose unit: mg

Timing - daily..

Named time event: in the morning

Named time event: at night

Direction duration: 1 day

Dose direction..

Direction sequence: 2

Dose pattern..

Dose amount: 300

Dose unit: mg

Timing - daily..

Frequency: 3 / day

Direction duration: 1 day

Dose direction..

Direction sequence: 3

Dose pattern..

Pattern sequence: 0

Dose amount: 300

Dose unit: mg

Timing - daily..

Named time event: in the morning

Named time event: in the afternoon

Dose pattern..

Pattern sequence: 1

Dose amount: 600

Dose unit: mg

Timing - daily..

Named time event: at night

Direction duration: 4 day

Dose direction..

Direction sequence: 4

Dose pattern..

Pattern sequence: 0

Dose amount: 600

Dose unit: mg

Timing - daily..

Named time event: in the morning

Dose pattern..

Pattern sequence: 1

Dose amount: 300

Dose unit: mg

Timing - daily..

Named time event: in the afternoon

Dose pattern..

Pattern sequence: 2

Dose amount: 600

Dose unit: mg

Timing - daily..

Named time event: at night

Direction duration: 1 day

Dose direction..

Direction sequence: 5

Dose pattern..

Dose amount: 600

Dose unit: mg

Timing - daily..

Frequency: 3 / day

Direction duration: indefinitely

## F. Dose-based medication order with use of 'timing repetitions'

Azithromycin - oral - 500 mg once daily three times a week (Mon Wed Fri) for 6 months

Medication order..

Medication item: Azithromycin

Route: oral

Parsable dose directions: "500mg od:6m, tw"

Dose direction..

Direction sequence: 0

Dose pattern..

Dose amount: 500

Dose unit: mg

Timing - daily..

Frequency: 1 / day

Timing - repetition..

Frequency: 3 / week

Specific day of the week: Monday

Specific day of the week: Wednesday

Specific day of the week: Friday

Direction duration: 6 m

## G. 'As required' product-based order with specified start date

Paracetamol 500mg tablet 1-2 tablets up to 4-6 hourly as required for knee pain from 1 Dec 2016 for 14 days [Maximum 8 tablets in 24 hrs]. Take with food.

Medication order..

Medication item: Paracetamol 500mg tablet

Parsable dose directions: "1-2 ^h4\h6 prn:7d [8 h24]"

Dose direction..

Dose pattern..

Dose amount: 1-2

Dose unit: tablet

Timing - daily..

Interval: <= 4-6 hr

As required: True

As required condition: for knee pain

Direction duration: indefinitely

Medication safety..

Maximum dose..

Maximum amount: 8

Maximum amount dose unit: tablets

Allowed period: 24 hours

Additional instruction: Take with food

Order details..

Order start date/time: 1 Dec 2016

### Notes

The 'up to' aspect of the dose interval is carried in the magnitude\_status attribute of the DV\_QUANTITY datatype of the openEHR reference model.

## H. Complex ‘Ad-hoc’ infusion with administration duration

This is an example of a complex 'ad-hoc' infusion containing a defined ingredient (morphine), a product ingredient (penicillin) and a diluent (saline).

The Medication item name must be generated by the prescriber to reflect the key components of the infusion mixture e.g. to appear on the prescription list or as a label on the infusion itself.

The parsable dose syntax does not cover this use-case and is therefore omitted.

100 mg Morphine liquid (10mg/ml) + 12g Benzylpenicillin (3g powder) in 100ml 0.9% Saline infusion given over 1 hour, starting immediately

Medication order..

Medication item: 100mg Morphine + 12g Benzylpenicillin in 100ml 0.9% Saline infusion

Preparation details..

Substance form: Infusion liquid

Category: Ad-hoc mixture

Ingredient..

Ingredient substance..

Substance name: Morphine

Category: Ingredient

Substance form: liquid for infusion

Strength amount: 10

Strength unit: mg

Diluent..

Diluent amount: 1

Diluent unit: ml

Ingredient amount:10

Ingredient amount unit: ml

Role: Therapeutic

Ingredient..

Ingredient substance..

Substance name: Benzylpenicillin powder for infusion (3g/1ml)

Substance form: powder for infusion

Category: Product

Ingredient amount:12

Ingredient amount unit: g

Role: Therapeutic

Ingredient..

Ingredient substance..

Substance name: 0.9% Saline infusion

Substance form: infusion liquid

Category: Product

Ingredient amount:100

Ingredient amount unit: ml

Role: Diluent

Dose direction..

Dose pattern..

Dose amount: 100

Dose unit: ml

Timing - daily..

Named time event: immediately (stat)

Dose administration duration: 1 hr

Order details..

Order start date/time: 1 July 2016