# 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](http://openehr.org/ckm/#showArchetype_1013.1.1445)

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

Therapeutic direction: <http://openehr.org/ckm/#showArchetype_1013.1.2753>

Dosage administration: <http://openehr.org/ckm/#showArchetype_1013.1.2751>

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.

### 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 directions: "1 m"

 Therapeutic direction..

 Direction sequence: 0

 Dosage administration..

 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 directions: "40mg m"

 Therapeutic direction..

 Dosage administration..

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

 Therapeutic direction..

 Dosage administration..

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

 Therapeutic direction..

 Direction sequence: 0

 Dosage administration..

 Dose amount: 2.5

 Dose unit: mg

 Timing - daily..

 Frequency: 1/day

 Direction duration: 1 day

 Therapeutic direction..

 Direction sequence: 1

 Dosage administration..

 Dose amount: 5

 Dose unit: mg

 Timing - daily..

 Frequency: 1/day

 Direction duration: 1 day

 Therapeutic direction..

 Direction sequence: 2

 Dosage administration..

 Pattern sequence: 0

 Dose amount: 5

 Dose unit: mg

 Timing - daily..

 Specific time: 1800

 Dosage administration..

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

 Therapeutic direction..

 Direction sequence: 0

 Dosage administration..

 Dose amount: 1

 Dose unit: tab

 Timing - daily..

 Named time event: in the morning

 Direction duration: 2 day

 Therapeutic direction..

 Direction sequence: 1

 Dosage administration..

 Dose amount: 1

 Dose unit: tab

 Timing - daily..

 Named time event: in the morning

 Named time event: at night

 Direction duration: 5 day

 Therapeutic direction..

 Direction sequence: 2

 Dosage administration..

 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 Dosage administrations

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 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"

 Therapeutic direction..

 Direction sequence: 0

 Dosage administration..

 Dose amount: 300

 Dose unit: mg

 Timing - daily..

 Named time event: at night

 Direction duration: 1 day

 Therapeutic direction..

 Direction sequence: 1

 Dosage administration..

 Dose amount: 300

 Dose unit: mg

 Timing - daily..

 Named time event: in the morning

 Named time event: at night

 Direction duration: 1 day

 Therapeutic direction..

 Direction sequence: 2

 Dosage administration..

 Dose amount: 300

 Dose unit: mg

 Timing - daily..

 Frequency: 3 / day

 Direction duration: 1 day

 Therapeutic direction..

 Direction sequence: 3

 Dosage administration..

 Pattern sequence: 0

 Dose amount: 300

 Dose unit: mg

 Timing - daily..

 Named time event: in the morning

 Named time event: in the afternoon

 Dosage administration..

 Pattern sequence: 1

 Dose amount: 600

 Dose unit: mg

 Timing - daily..

 Named time event: at night

 Direction duration: 4 day

 Therapeutic direction..

 Direction sequence: 4

 Dosage administration..

 Pattern sequence: 0

 Dose amount: 600

 Dose unit: mg

 Timing - daily..

 Named time event: in the morning

 Dosage administration..

 Pattern sequence: 1

 Dose amount: 300

 Dose unit: mg

 Timing - daily..

 Named time event: in the afternoon

 Dosage administration..

 Pattern sequence: 2

 Dose amount: 600

 Dose unit: mg

 Timing - daily..

 Named time event: at night

 Direction duration: 1 day

 Therapeutic direction..

 Direction sequence: 5

 Dosage administration..

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

 Therapeutic direction..

 Direction sequence: 0

 Dosage administration..

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

 Therapeutic direction..

 Dosage administration..

 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

 Therapeutic direction..

 Dosage administration..

 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