

## PRSB outpatient letter – Medications and medical devices information model

### Purpose

This paper provides an information model for medications and medical devices. It is based on the outpatient letter heading 'Medications and medical devices' published in the Academy of Medical Royal Colleges (AoMRC) Clinical Documentation and Generic Record Standards (2013), and the information model produced for the hospital discharge summary 2 project. It provides an information model which NHS digital will use to develop a technical specification for an electronic outpatient letter communication.

### Glossary

Glossary of terms used in the information model

Term	Definition
Cardinality	The number of elements in a set. Eg. The medications and medical devices section may have 0 to many medication records in it.
Section or Container	This is the equivalent of a main heading in the AoMRC headings, eg. allergies and adverse reactions, procedures, etc.
Record entry	A single record, eg. a medication item or a diagnosis, which will be made up of one or more data items, eg. name, form route, dose amount of medication.
Cluster	A group of data items which make up a record entry, for example, diagnosis record entry is made up of the following data items: diagnosis/symptom, stage of disease and comment.
Iteration	A rule which applies to each repetition of a record entry, for example, only one medication item can be included in a medication record entry.

### AoMRC heading

AoMRC outpatient letter heading 'Medications and medical devices' with the following sub headings (2013):

- Medication name
- Medication form
- Route
- Dose
- Medication frequency
- Additional instructions
- Do not discontinue warning
- Reason for medication
- Medication recommendations
- Medication change
- Reason for medication change
- Medical devices

Description:

Under this heading information about new medications, changes to existing medications and discontinuation of medications and medical devices must be included.

Rules for heading:

- Optional
- Cardinality 0 to 1

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## *Information model*

### **“Medications and medical devices”**

Description:

Name: Medications and medical devices

This represents the AoMRC heading of the same name. Acts as a ‘container’

Handles three categories of content:

- Medication items
- Medication discontinued
- Medical devices

Rules for top ‘Section’ level (This is the main heading level - i.e. the container):

Name: Medications and devices

Optional

Cardinality 0 to 1

Rules for content:

- Medication item entry
  - All medications and devices that can be dm+d coded to be entered via this Medication item entry
  - Can be 0 to many instances of Medication item
  - Only one Medication item per iteration
  - Handles details of new and changed medications as a result of the outpatient encounter
- Medication discontinued entry
  - All medications (and devices) discontinued by the clinician during the outpatient encounter to be entered via Medication discontinued entry; this is intended to apply to those medications (and devices) that the patient was taking prior to the outpatient encounter but discontinued during the outpatient encounter
  - Can be 0 to many instances of Medication discontinued
  - Only one Medication discontinued per iteration
- Medical devices entry
  - Any medical device that cannot be handled by medications item entry to be entered here
  - Single textual entry which can carry details of 0 to many Medical devices

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Data entries handling content in this model

### Medication item entry

Name: Medication item

NB: Implementation and user guidance to make clear that **any prescribable medication or medication device that has dm+d representation** should be handled by this entry (see Medical devices item below)

### Medication discontinued entry

Name: Medication discontinued

### Medical devices item entry

Required new component to handle medical devices that cannot handled by Medication item entry (see above)

Name: Medical devices

Text

Optional

Cardinality 0 to many

Recommended AoMRC description / explanation: "Any therapeutic medical device of relevance that does not have representation in dm+d. Such devices will generally not be prescribable in general practice. Entered as free text"

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### Medication item entry

#### Medication item cluster

(Based on Scottish CKM work: see Notes at end for data items to be omitted and others acting as placeholders)

##### Medication name

Choice of

- Text
- Coded text – constraint: MedicationName. Any AMP/VMP/VTM/AMPP/VMPP subsets from the dm+d terminology. NHS dm+d AMP ::352201000001139 NHS dm+d AMPP ::352401000001135 NHS dm+d VMP ::352701000001133 NHS dm+d VMPP ::352301000001131 NHS dm+d VTM ::352601000001138. Constraint binding: [dm+d]subset=NHS\_dm+d

Mandatory

Cardinality 1

Mandatory medication name coded using a SNOMED CT/dm+d term where possible, allowing plain text for historical/patient reported items , extemporaneous preparations or those not registered in dm+d. *Comment: e.g. "Citalopram tab 20mg", "Trimethoprim"*

##### Form

Choice of

- Text
- Coded text – constraint: DrugDoseForm. SNOMED CT CfH DoseForm termset. Any descendant of 421967003 | drug dose form. Constraint binding: [SNOMED CT]subset=CfH DoseForm

Optional

Cardinality 0 to 1

Form of the medicinal substance e.g capsules, tablets, liquid. Not normally required unless a specific form has been requested by the prescriber. *Comment: e.g. "Modified Release Capsules"*

### **Route**

Choice of

- Text
- Coded text – constraint: NHS e-prescribing route of administration subset ID: 413001000001136 Original Id : 30201000001137 This is an extract from the SUBSET - BiAnnual-Drug-15.0.1-20130401: SnomedCT\_GB1000001\_20130401/Subsets/EPrescribing/NHS e-Prescribing route of administration subset. Constraint binding: [SNOMED-CT]subset=NHS e-Prescribing route of administration subset

Optional

Cardinality 0 to many

Optional medication route, using SNOMED CT terms where possible. Not generally applicable to product-based medication. Should not be used to specify a specific administration site, for which a separate archetype is used e.g. The Route is 'intraocular' the Site may be 'Left eye'. *Comment: e.g. "Oral", "Intraocular". Note that this element supports multiple Routes to allow a choice to be specified by the prescriber*

### **Site**

Choice of

- Text
- Coded text – constraint: SiteOfMedicationAdministration. Any valid site for the administration of a medication. Constraint binding: [SNOMED-CT]subset=SiteOfMedicationAdministration

Optional

Cardinality 0 to 1

The anatomical site at which the medication is to be administered. *Comment: e.g. "Left eye"*

### **Method**

Text

Optional

Cardinality 0 to 1

The technique or method by which the medication is to be administered.

### **Dose directions description**

Text

Optional

Cardinality 0 to 1

A single plain text phrase describing the entire medication dosage and administration

directions, including dose quantity and medication frequency. *Comment: e.g. "1 tablet at night" or "20mg at 10pm" This is the form of dosage direction text normally available from UK GP systems.*

#### **Dose amount**

Text

Optional

Cardinality 0 to 1

A plain text description of medication single dose amount, as described in the AoMRC medication headings. *Comment: e.g. "30 mg" or "2 tabs". UK Secondary care clinicians and systems normally minimally structure their dose directions, separating Dose amount and Dose timing (often referred to as Dose and Frequency). This format is not normally used in GP systems, which will always import Dose and Frequency descriptions concatenated into the single Dose directions description.*

#### **Dose timing**

Text

Optional

Cardinality 0 to 1

A plain text description of medication dose frequency, as described in the AoMRC medication headings. *Comment: e.g. "Twice a day", "At 8am 2pm and 10pm". UK Secondary care clinicians and systems normally minimally structure their dose directions, separating Dose amount and Dose timing (often referred to as Dose and Frequency). This format is not normally used in GP systems, which will always import Dose and Frequency descriptions concatenated into the single Dose directions description.*

#### **Parsable dose directions \*\*\***

Text

Optional

Cardinality 0 to 1

A parsable 'dose syntax' which carries dose strength, dose timing, dose duration and maximum dose information. *Comment: e.g. "20-30mg ^4/6h prn [180mg /24h]" = 20 to 30 mgs, up to 4-6 hourly as required. Maximum 180mg in 24 hours. The 'as required reason' e.g. 'for pain' should be carried in the Additional Instruction element. Note that this is generally a symptom and is not the same as the Indication which will usually describe a diagnosis or condition. Where supported, this would generally be used to exchange dosage information between systems, while Structured dose directions are likely to be used only within openEHR-based systems.*

#### **Structured dose direction cluster**

Optional

Cardinality 0 to many

A structural representation of the elements carried by the dose syntax in 'Parsable dose

Strength / timing' i.e. dose strength, dose timing, dose duration and maximum dose.

**Structured dose amount cluster \*\*\***

Optional

A structural representation of dose amount. *Comment: e.g. 20mg or 2 tablets This element will generally only be used when persisting data within systems with 'Parsable dose directions' being used to exchange the same information between systems.*

**Structured dose timing cluster \*\*\***

Optional

A slot containing a structural, computable representation of dose timing and maximum dose. *Comment: This element will generally only be used when persisting data within systems with 'Parsable dose directions' being used to exchange the same information between systems.*

**Dose direction duration**

Choice of Coded Text

- Continue indefinitely [The medication should be continued indefinitely.]
- Do not discontinue [The medication should be continued indefinitely and the prescriber highly recommends that it should never be discontinued. This is an AoMRC Clinical Headings recommendation.]
- Stop when course complete. [The medication should be stopped when the currently prescribed course has been completed.]
- Duration: Allowed values: years, months, weeks, days, hours >=0 days

Optional

Cardinality 0 to 1

**Additional instruction (see run time name constraint)**

Runtime name constraint:

- Additional instruction [Additional multiple dosage or administration instructions as plain text. This may include guidance to the prescriber, patient or person administering the medication. In some settings, specific Administration Instructions may be re-labelled as "Patient advice" or "Dispensing Instruction" to capture these flavours of instruction.]
- Dispensing instruction [Multiple plain text to record complex dispensing arrangements, particularly for Controlled Drug instalment dispensing. 'Dispensing instructions' may be used as a specific label to overwrite 'Additional instructions' to align with legacy GP system behaviour.]
- Patient advice [Multiple plain text instructions intended for patient or carer. 'Patient advice' may be used as a specific label to overwrite 'Additional instructions' to align with legacy GP system behaviour.]
- Monitoring [Special instructions related to monitoring of medication, such as lab tests.]

Text  
Optional  
Cardinality 0 to many

Additional multiple dosage or administration instructions as plain text. This may include guidance to the prescriber, patient or person administering the medication. In some settings, specific Administration Instructions may be re-labelled as 'Patient advice' or 'Dispensing Instruction' to capture these flavours of instruction. *Comment: e.g. "Omit morning dose on day of procedure", "for pain or fever", "Dispense weekly".*

**Course details cluster**

Optional  
Cardinality 0 to 1

Details of the overall course of medication.

**Course status \*\***

Choice of Coded text

- Active [This is an active medication.]
- Discontinued [This is a medication that has been issued, dispensed or administered but has now been discontinued.]
- Never active [A medication which was ordered or authorised but has been cancelled prior to being issued, dispensed or administered.]
- Completed [The medication course has been completed.]
- Obsolete [This medication order has been superseded by another.]

Optional  
Cardinality 0 to 1

The status of this prescription in an ambulatory (outpatient/GP/community) context.

**Start datetime**

Date/time  
Optional  
Cardinality 0 to 1

The date and/or time that the medication course should begin.

**End datetime**

Date/time  
Optional  
Cardinality 0 to 1

The date and/or time that the medication course should finish.

**Indication**

Text

Optional  
Cardinality 0 to 1

A free text or Coded text term giving the clinical indication or reason for ordering the medication. Coded terms are preferable. *Comment: e.g. "Angina". The Indication generally describes a condition or diagnosis*

**Link to indication record**

URL  
Optional  
Cardinality 0 to 1

A link to the record which contains the Indication for this medication order.

**Comment / recommendation**

Text  
Optional  
Cardinality 0 to 1

Additional comment or recommendation about the medication course e.g. 'Patient named supply', 'unlicensed medication', 'Foreign brand' or monitoring recommendations

**Medication change summary cluster**

Optional  
Cardinality 0 to 1

Records the changes made to medication during the outpatient encounter

**Status**

Choice of Coded text

- Continued [Medicine patient is taking prior to outpatient appointment and continued with no amendments.]
- Added [Medicine prescribed during the outpatient appointment, which the patient was not taking prior to the appointment]
- Amended [Medicine patient was taking prior to outpatient appointment, which is continued after the outpatient encounter, but with amendment(s) made during the encounter.]

Optional  
Cardinality 0 to 1

No The nature of any change made to the medication during the encounter. *Comment: additional information is required*

**Indication**



Text  
Optional  
Cardinality 0 to 1

The clinical indication for any changes in medication status.

**Date of latest change**

Date / time  
Optional  
Cardinality 0 to 1

The date of the latest change - addition, or amendment.

**Description of amendment**

Text  
Optional  
Cardinality 0 to 1

A description of any amendment.

**Comment**

Text  
Optional  
Cardinality 0 to 1

Any additional comment about the medication change.

**Total dose daily quantity cluster \*\***

Optional  
Cardinality 0 to 1

The total daily dose of this medication. This is helpful for estimating optimal adherence to dosing guidance. It may be computed from product/dose strength and frequency or entered manually.

**Notes**

\*\* Data items not relevant to Hospital to GP outpatient letter

\*\*\* Data items acting as placeholders for future 'advanced' structured dose syntax solution. In sufficient information to detail these further at present

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### ***Medication discontinued entry***

Records medications / medical devices present on arrival at the outpatient encounter but discontinued during the outpatient encounter.

(This will broadly follow the same structure as the Medication change summary cluster but with addition of new data item "Name of discontinued medication" to enable this cluster to function as an entry)

#### **Name of discontinued medication**

Text

Mandatory

Cardinality 1

The name of the medication or medical device being discontinued

#### **Status**

Coded text: Removed [The medication was present on arrival at the outpatient encounter but not on leaving the outpatient encounter.]

Mandatory

Cardinality 1

The nature of any change made to the medication during the outpatient encounter. *Comment: No additional information is required*

#### **Indication**

Text

Optional

Cardinality 0 to 1

The clinical indication for any changes in medication status.

#### **Date of latest change**

Date / time

Optional

Cardinality 0 to 1

The date of the discontinuation

#### **Description of amendment**

Text

Optional

Cardinality 0 to 1

A description of any amendment.

**Comment**

Text

Optional

Cardinality 0 to 1

Any additional comment about the medication change.

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**Medical devices entry**

Text

Optional

Cardinality 0 to many

To carry information about any medical device that cannot be handled by medications item entry.  
The expectation is that in time only those medical devices that cannot be dm+d coded will be  
entered here

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*How the 2013 AoMRC sub headings match to elements in the proposed information model above*

<b>AoMRC sub heading</b>	<b>Information model item</b>	<b>Found in</b>
Medication name	Medication name	Medication item entry
Medication form	Form	Medication item entry
Route	Route	Medication item entry
Dose	Dose amount description	Medication item entry
Medication frequency	Dose timing description	Medication item entry
Additional instructions	Additional instruction	Medication item entry
Do not discontinue warning	Dose direction duration	Structured dose direction cluster
Reason for medication	Indication #	Course details cluster
Medication recommendations	Comment /recommendation	Course details cluster
Medication change	Description of amendment	Medication change summary cluster for additions / amendments Medication discontinued entry for discontinued medications
Reason for medication change	Indication ##	Medication change summary cluster for additions / amendments Medication discontinued entry for discontinued medications
Medical devices	Medical devices	New data item / entry