PRSB e-discharge summary phase 2 – Medications and medical devices information model

Purpose

This paper provides an information model for medications and medical devices. It is based on the discharge summary heading 'Medications and medical devices' published in the Academy of Medical Royal Colleges (AoMRC) Clinical Documentation and Generic Record Standards (2013). It provides an information model which the Health and Social Care Information Centre (HSCIC) will use to develop a CDA specification for an e-discharge summary.

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 discharge summary 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 all discharge medications, medication changes, and medical devices must be included

Rules for heading:

- Optional
- Cardinality 0 to 1

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 continuation / addition / amendment of admission medications
- Medication discontinued entry
  - All admission medications (and devices) discontinued during hospital stay to be entered via Medication discontinued entry; this is intended to apply to those medications (and devices) that were active on admission but discontinued prior to discharge
  - 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. "I 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 since admission

Status
Choice of Coded text

- Continued [Medicine present on both admission and discharge with no amendments.]
- Added [Medicine present on discharge but not on admission]
- Amended [Medicine present on both admission and discharge but with amendment(s) since admission.]

Optional
Cardinality 0 to 1

The nature of any change made to the medication since admission. *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 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 adherance 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 discharge summary

*** 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 admission but subsequently discontinued.
(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 admission but not at discharge.]
Mandatory
Cardinality 1

The nature of any change made to the medication since admission. *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.

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

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

AoMRC sub heading	Information model item	Found in
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

In CDA implementation this could be named “Reason for medication”
In CDA implementation this could be named “Reason for medication change”