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Mapping Guidance for dm+d

Document management

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Reviewers

This document must be reviewed by the following people:

Reviewer name	Title / Responsibility	Date	Version
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Approved by

This document must be approved by the following people:

Name	Signature	Title	Date	Version
Jo Goulding		Consultant Terminology Specialist - Pharmacy	04/05/2021	V1.0

Glossary of Terms

Term / Abbreviation	What it stands for
Actual Medicinal Product/AMP	An Actual Medicinal Product (AMP) is a single dose unit of a finished dose form (unless the product is presented as a continuous dosage form), attributable to an identified supplier that contains a specified amount of an ingredient substance. It describes an actual product which is known to have been available linked to the name of a particular supplier, for example ‘Aspirin 300mg caplets (The Boots Company Plc) '.
Actual Medicinal Product Pack/AMPP	An Actual Medicinal Product Pack (AMPP) is the packaged product that is supplied for direct patient use or from which AMPs are supplied for direct patient use. The AMPP describes an actual product which is known to have been available linked to both the name of a particular supplier and information on the pack size of the product, for example ‘Aspirin 300mg caplets (The Boots Company Plc) 32 tablet’. It may contain multiple components each of which may or may not be an AMPP in their own right.

COTS	An abbreviation used to denote a drug dictionary that is produced as a Commercial Off the Shelf product.
EPS	The NHS Electronic Prescription Service which EPS enables prescribers to send prescriptions electronically to a dispenser (such as a pharmacy) directly without the use of paper prescriptions.
NHS dictionary of medicines and devices/dm+d	A terminological resource containing unique identifiers and associated textual descriptions for representing medicines and medical devices used within the UK.
Summary of Product Characteristics/SmPC	Part of the regulatory documentation for licensed medicines.
Virtual Medicinal Product/VMP	A Virtual Medicinal Product (VMP) is an abstract concept representing the properties of one or more clinically equivalent Actual Medicinal Products, where clinical is defined as relating to the course of a disease. The Virtual Medicinal Product describes the generic title for a product including the form and strength, for example 'Aspirin 300mg tablets'.
Virtual Medicinal Product Pack/VMPP	A Virtual Medicinal Product Pack (VMPP) is an abstract concept representing the properties of one or more quantitatively equivalent AMPPs. It describes the generic title for a generic or proprietary product pack which is known to have been available. The description includes the pack size, for example 'Aspirin 300mg tablets 32 tablet'.
Virtual Therapeutic Moiety/VTM	A Virtual Therapeutic Moiety (VTM) is the abstract representation of the substance(s), formulated as a medicinal product, intended by an authorising health care professional for use in the treatment of the patient. Examples of Virtual Therapeutic Moieties: Aspirin Atenolol Co-amoxiclav Doxorubicin Fluorouracil Paracetamol + Metoclopramide Moiety is often used synonymously with the chemical term 'functional group' but there are subtle differences in meaning which are explained here.

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Contents

1. Introduction

The use cases to be supported and the direction of the map (to dm+d or from dm+d) will define what is an acceptable map. This document is provided to aid understanding of dm+d and in creating mappings to dm+d. However ultimately the creator of the mappings, dependent upon the use case to be supported, will need to decide when it is appropriate to create a map.

Many implementations of clinical or pharmacy systems utilise local or proprietary drug databases which meet their requirements as a stand-alone system or enable access to other data resources such as pharmacy dispensing, decision support, formulary information, or specialised systems. However, to provide interoperability where machine readable data can be transferred and integrated requires a single drug dictionary to be used across all NHS locations.

The NHS Dictionary of Medicines and Devices (dm+d) is the standard for transferring information relating directly to a patient's care between diverse clinical systems. It is required for all Electronic Prescription System (EPS) Release 2 prescribing which uses the dm+d codes to send prescription information between different prescribing and dispensing systems. The Summary Care Record is an electronic record of important patient information that is accessible to authorised NHS professionals and includes medication records using dm+d coded data.

Mapping between local or proprietary drug dictionaries allows for a smoother transition to the dm+d standard however it introduces additional risk to patient safety compared to native use of a dm+d drug dictionary. It is important that health and social care organisations and their software system vendors, as providers of a mapped solution, recognise this clinical safety risk and put steps in place to mitigate against any risks when undertaking mapping.

To support bi-directional information exchange mapping must be a semantically interoperable match (1:1 or exact match). Due to the diversity of system vendor and local descriptions this mapping criteria has been developed to guide users on how best to approach the mapping and define what are acceptable exceptions to support operational issues.

2. Responsibilities and Implementation Options

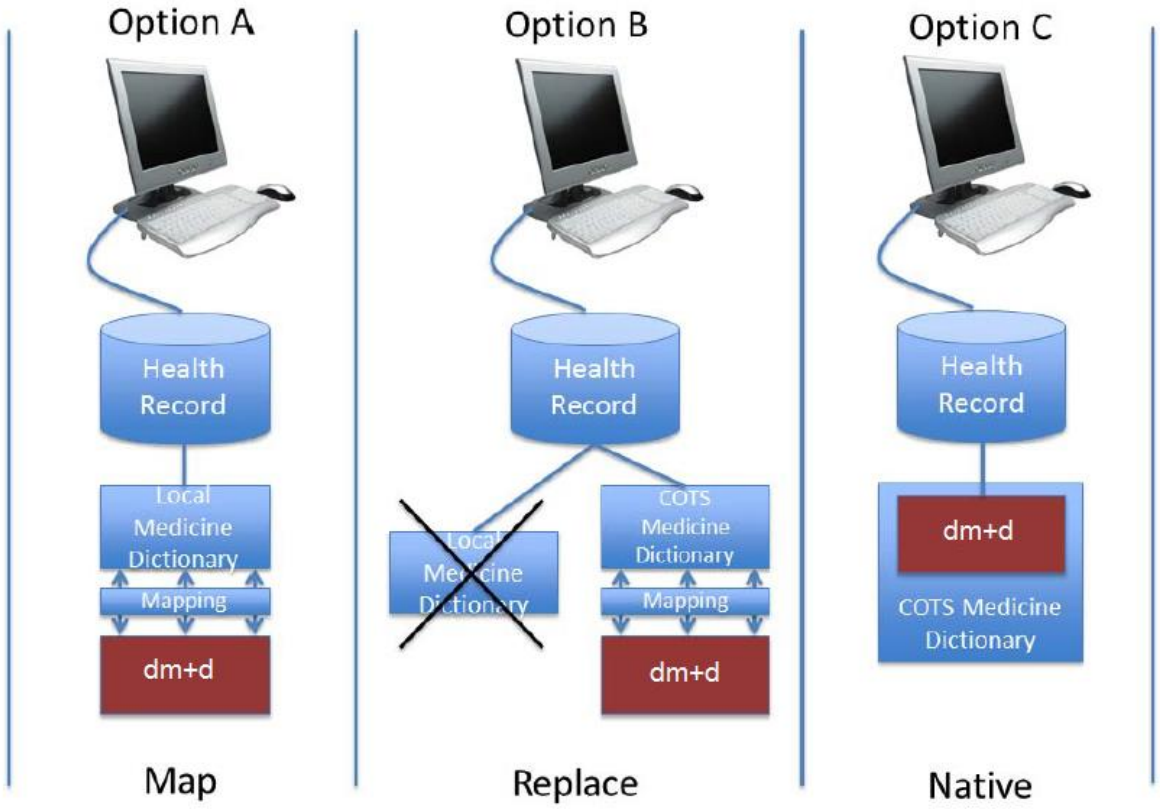

Figure 1: Types of dm+d implementation[1]

There are three types of dm+d implementation listed in order of increasing digital maturity:

A. Mapping of dm+d to an existing local drug dictionary. This requires the organisation to complete the initial mapping exercise and manage the maintenance activities associated with subsequent dm+d releases. The user interacts with the local drug dictionary through the user interface. Local drug dictionary terms are recorded in the health record and mapped to dm+d concepts for the purpose of transferring information in system-to-system messages.
B. Replace the current local medicine list with a Commercial Off The Shelf (COTS) drug dictionary that has been mapped to dm+d. The mapping and maintenance activities of this option are undertaken by the vendor of the drug dictionary. The user interacts with the local drug dictionary through the user interface. Local drug dictionary terms are recorded in the health record and mapped to dm+d concepts for the purpose of transferring information in system-to-system messages.
C. Native implementation of dm+d. The healthcare application uses dm+d in its native form (this could be absorbed by the application or accessed via a commercial drug dictionary), the distinction in this option is that users of the application are interacting with dm+d concepts through the user interface and dm+d concepts are stored and shared throughout the system. A commercial drug dictionary may still be required alongside dm+d to provide certain resources and functions such as decision support.

[1]Ref - NHS dictionary of medicines and devices (dm+d) Requirement Specification for SCCI0052

Implementers are not limited to only these options and it is likely that many implementations will be a hybrid of more than one option.

The use of mapping between drug dictionaries carries an additional risk to patient safety compared to the use of a dictionary natively but allows for a smoother transition to the dm+d Medicines Interoperability Standard (SCCI0052: Dictionary of medicines and devices (dm+d)). It is important that health and care organisations and their IT suppliers recognise this clinical safety risk and put steps in place to mitigate it.

Requirement 13 of the dm+d Standard is:

> dm+d MAY either be used natively, i.e., as the sole medicine terminology, or by accurately mapping between another dictionary and dm+d. If dm+d is mapped, the health and care organisation is responsible for the mapping. They MUST ensure it is fit for purpose and appropriately maintained.
>
> To ensure that introduction of new systems or changes to systems does not adversely impact on patient safety, the development and deployment of systems that use dm+d or are integrated with third party terminologies, will need to conform with Clinical Risk Management Standards, namely:
>
> DCB0160 - Clinical Risk Management: its Application in the Deployment and Use of Health IT Systems.
>
> DCB0129 - Clinical Risk Management: its Application in the Manufacture of Health IT Systems.

Key Points:

- Where a mapped solution is implemented, all maps should be checked for accuracy. Providers of mappings to dm+d must therefore ensure adequate resources to undertake and assure the mapping. It is however outside the scope of this document to stipulate how providers or system vendors manage their mapping and quality assurance processes.
- Where a mapped solution has been implemented, the provider of the map data is responsible for the mapping and for any adverse incident arising because of an inaccurately produced map. They should ensure it is fit for purpose and appropriately maintained.
- Where maps to locally managed drug descriptions or changes to a system supplier generated map are created, the responsibility for those changes and for any adverse incident arising because of an inaccurately produced map is that of the local maintainer.
- NHS Digital will not validate or underwrite the accuracy of any dm+d mapping solution.
- dm+d is updated weekly since the UK medicines economy is dynamic and continuously updating. Where maps are created to record patient data in live clinical systems processes should be put in place to maintain and update the maps on a regular basis.

3. The dm+d model

dm+d consists of five distinct concept classes:

- Virtual Therapeutic Moiety (VTM)
- Virtual Medicinal Product (VMP)
- Actual Medicinal Product (AMP)
- Virtual Medicinal Product Pack (VMPP)
- Actual Medicinal Product Pack (AMPP)

The diagram below provides a simplified version of the dm+d model showing these 5 main concept classes. Each concept class contains differing amounts of information to represent a medicinal substance or product. Products should be mapped at the appropriate level. Hospital Prescribing systems are likely to use those at VTM, VMP or AMP level. Whereas Primary Care (EPS) prescribing systems use only VMP and AMP levels and pharmacy systems may use either product level (VMP and AMP) or at the pack level (VMPP and AMPP).

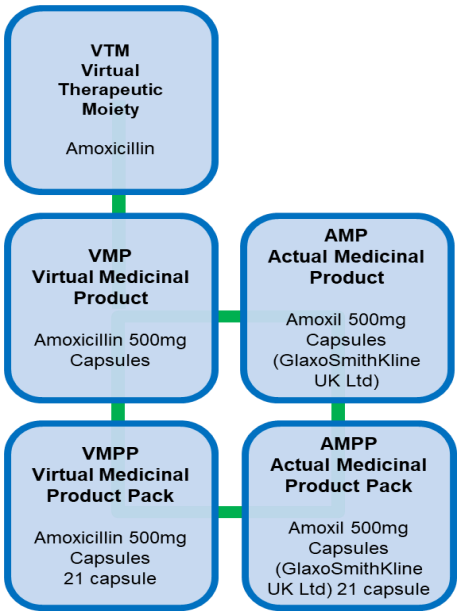

Figure 2: dm+d model

4. Common Mapping Issues

In creating a map to or from dm+d the following considerations may improve the level of mapping achieved. For the purposes of this document the database that is being mapped to or from dm+d is referred to as the system drug dictionary and may be either a local drug dictionary, a commercial drug dictionary or a hybrid (see Section 2).

4.1. Missing items

Sometimes the description for a particular medicine or medical device might not be present in the database used to map to dm+d. A possible reason is the item is in the dm+d but the database used in the mapping tool has not been updated.

In this situation it is possible to check whether the item is actually in the dm+d by using the dm+d browser: NHSBSA - dm+d Browser

Occasionally, the product required to map to may not be in the dm+d. Items that are missing from dm+d can be requested from the NHS Business Services Authority (NHSBSA) by e-mailing the dm+d helpdesk at NHS BSA. The NHS BSA should respond within 10 days to indicate what response will be made to the enquiry.

Where products required for a mapping to dm+d are not present the non-dm+d product should be left unmapped. and once the product is added to dm+d and the ID published a map can be created.

4.2. Word order

dm+d descriptions are in this order:

> product, strength, formulation, unit of presentation.

Databases that show the same information but where the word order differs can be considered an exact match.

4.3. Term strings

Databases that show less information than the dm+d term (for example the unit of presentation could be omitted) may be a match to a more closely specified dm+d concept where there is only one possible match and there is no ambiguity as to the product it is referring to. Be aware this may change over time as new products come to market and are included in dm+d.

For example, a local database may describe a product as.

> Furosemide 250mg/5ml solution for injection

The dm+d term is Furosemide 250mg/5ml solution for injection vials

Since there is no alternative presentation in this strength/presentation currently available such as ampoules or pre-filled syringes these two concepts can be mapped.

Another example would be the representation of inhalers where a non-dm+d dictionary may describe a generic salbutamol inhaler as:

> Salbutamol 100micrograms/dose inhaler

dm+d uses the description:

> Salbutamol 100micrograms/dose inhaler CFC free

Since there are no longer CFC free Salbutamol inhalers available in the UK dependent upon the use case these two products may be mapped.

4.4. Naming conventions

In some cases, dm+d may use different words to those found in non-dm+d drug dictionaries.

In dm+d 'enteric coated' tablets are described as 'gastro-resistant'

dm+d dose forms are based on the dose forms used by medicines regulators and may be more granular than those used in non-dm+d drug dictionary descriptions. Some examples are shown below.

dm+d describes injectable products in several ways:

- Emulsion and suspension for emulsion for injection
- Emulsion for infusion
- Emulsion for injection
- Injection
- Powder and solvent for prolonged-release suspension for injection
- Powder and solvent for solution for infusion

Dependent upon the editorial policy used to create the non-dm+d database it may be acceptable to consider all of these as equivalent to the word inj or injection.

dm+d has many different dose forms to represent oral liquids:

- Oral solution
- Oral suspension
- Oral liquid

Different product names may be used by dm+d as compared to other drug dictionaries

e.g.

ALCOHOL (Unlicensed) (Ethanol) 70% (5mL) Injection ampoules

ALCOHOL (Unlicensed) (Ethanol) 90% (20mL) Injection ampoules

ALCOHOL DEHYDRATED (Absolute Alcohol) (2mL) Injection ampoules

ALCOHOL DEHYDRATED (Absolute Alcohol) (5mL) Injection ampoules

In dm+d these are Ethanol solution for injection

Ethanol 70% solution for injection 5ml ampoules
Ethanol 90% solution for injection 20ml vials
Ethanol 100% solution for injection 2ml ampoules
Ethanol 100% solution for injection 5ml ampoules

Dependent upon the editorial policy used to create the non-dm+d database it may be acceptable to map a less specifically described non-dm+d concept. However the non-dm+d dictionary description should be updated in line with the dm+d product.

4.5. For inhalers

dm+d uses the term 'dose' as opposed to 'actuation', 'inhalation' or ‘puff'. For the purposes of mapping, it may be acceptable to consider all of these as equivalent ways to express inhaler strengths.

It is possible to describe inhaler dose strengths in terms of either the metered dose:

Spiriva 18microgram inhalation powder capsules (Boehringer Ingelheim Ltd)

or the delivered dose:

Braltus 10microgram inhalation powder capsules with Zonda inhaler (CST Pharma Ltd)

For new inhaled medicines (where there are no brands already on the market) that are added to dm+d, the VMP name will be described using the delivered dose(s) and the AMP name will reflect the naming in the Summary of Product Characteristics (SmPC).

Where the non-dm+d database shows a different strength for an inhaler, the ingredient strength information should be checked to see if both terms are referencing the same product. Where the strengths are equivalent the non-dm+d inhaler term should be mapped to the dm+d AMP concept.

4.6. Abbreviations

dm+d does not use abbreviations in the concept names or descriptions. In some cases, the descriptions defined by dm+d are much longer than the titles used in non-dm+d drug databases. Where a database uses an abbreviation for a specific form e.g., inj for injection, tab for tablet, it may be acceptable to consider all of these as equivalent to the expanded description in dm+d.

(For prescribable VMPs and AMPs dm+d does provide a short name that may be used for labelling but since this text string is not unique it should not be used in pick lists for product selection)

4.7. Homecare/ TTO/ study/ trial/ over-labelled

Some product descriptions in non-dm+d databases may include information such as Homecare/ TTO/ study/ trial/ over-label (or the equivalent abbreviation) to indicate the prescription is intended to be supplied from a specific allocation of stock. Dependent upon the use case it may be acceptable to map these entries to the standard dm+d representation but it is important to be aware of the overarching requirement to maintain a one to one mapping to dm+d

For example, the non-dm+d dictionary may have a concept of:

Simvastatin 80mg tablets (study)

In dm+d there is the product:

Simvastatin 80mg tablets

Dependent upon the use case it may be acceptable to map these two products

4.8. Local descriptions

Where local descriptions include wording that describe a more specific product for example “syringe driver”, “red tablets” or “caplets” unless they can be mapped on a 1:1 basis to a specific dm+d AMP concept they should be left unmapped.

4.9. Intended route for dose forms

Some dm+d dose forms identify the intended route in the dose form term for example:

Oral solution
Transdermal patch

This data may not be identified in non-dm+d databases. Where it has been confirmed that the same product is referenced this can be mapped to the dm+d concept.

4.10. Freeness

dm+d identifies freeness (for example sugar-free, gluten-free, preservative- free) for some dose forms. The freeness is identified in the coded data and in the term at VMP and VMPP. The inclusion of freeness information at AMP/AMPP is dependent upon whether the manufactured products include that information on the label. It may be that the non-dm+d database does not identify freeness. Where it has been confirmed that the same product is referenced this can be mapped. Be aware this may change over time as new products come to market and are included in dm+d.

For example, a non-dm+d database may have a for Zantac syrup of generic representation of:

Ranitidine 75mg/5ml oral solution.

dm+d includes the information in the term that this product is sugar-free (although the manufacturers do not specifically identify this in their labelling) as shown below:

Ranitidine 75mg/5ml oral solution sugar free

These two products can be mapped as referring to the same product.

4.11. Quantities and units of measure

For inhalers, dm+d expresses the number of doses contained within each inhaler, for example rather than the prescription requesting '1 inhaler', the prescription may read '200 dose'. For the purposes of mapping, it may be acceptable to consider all of these as equivalent ways to express the same product.

For example, a non-dm+d dictionary may describe an inhaler pack as:

Salbutamol 100micrograms/dose inhaler CFC free 200 actuation

dm+d describes inhaler sizes in terms of doses:

Salbutamol 100micrograms/dose inhaler CFC free 200 dose

4.12. Strength

dm+d strengths are usually described in terms of the amount per unit dose. A non-dm+d database may describe the strength differently however if the strengths are equivalent (e.g., 120mg/5ml vs 24mg/ml) the entry can be mapped.

Strengths in dm+d are expressed as “x/y”. Non-dm+d databases may describe a strength as “x in y”. Provided the values are the same this can be considered as equivalent.

Non-dm+d databases may express strengths as a concentration rather than the amount per unit dose.

For example:

Salbutamol 2mg/ml nebuliser liquid unit 2.5ml dose vials

or

Salbutamol 5mg/2.5ml nebuliser liquid unit dose vials

Where the description relates to the same product strength and unit dose size it is possible to create a map.

Strengths may be expressed using a number of units of measure dependent upon monographs and manufacturers' labelling.

In dm+d there is a VMP product with no licensed products associated:

Sodium chloride 58.5mg/5ml oral solution

Non-dm+d data bases may describe the equivalent product using the term:

Sodium chloride 1mmol/5ml oral solution.

Where the conversion from one unit of measure to another provides a match, it is possible to create a map.

Care should be taken to ensure that the substance that is the basis of strength is the same in both for both products.

4.13. Invalid items

Items that have a status of invalid in dm+d have been given this status to indicate there is a problem with the entry. It may be that it is ambiguous, incorrect or does not exist and so current non-dm+d database entries should not be mapped to these entries.

4.14. AMP names vs AMP descriptions

When mapping to dm+d AMP and AMPP concepts the descriptions (rather than the AMP or AMPP names) should be visible since these terms include the supplier name.

An example of an AMP name is:

Eliquis 5mg tablets

The AMP description for the same concept is:

Eliquis 5mg tablets (Bristol-Myers Squibb Pharmaceuticals Ltd)

Because of the availability of parallel imports and co-marketing of products it is possible that there will be multiple suppliers for a single AMP or AMPP.

See section also section 4.15 below for mapping to specific supplier AMP/AMPP concepts.

4.15. Suppliers for branded products

Branded products for which an exact supplier (as specified in dm+d descriptions) cannot be identified should be mapped where possible to the brand originator as specified in the British National Formulary (BNF). This may for example apply to parallel imports or where products are manufactured under licence by another manufacturer. Please note that this is an interim solution - discussions are under way to develop an alternative solution.

4.16. Bracketed brand names

It is common practice in some secondary care systems to describe a product using the generic term but add brand information in brackets.

For example:

Diltiazem (Adizem SR) 120mg modified-release tablets

ACLIDINIUM (Eklira Genuair) 322 micrograms Dry Powder for Inhalation

If a brand name appears either on its own or within brackets within the non-dm+d dictionary term, then this should be mapped to the appropriate AMP or AMPP and not the VMP or VMPP. Whilst the description differs to the dm+d Editorial policy this would be an acceptable map.

4.17. Units of presentation for parenteral products

dm+d describes parenteral products using the format

Drug – strength – dose form – unit of presentation

For example:

Ciprofloxacin 100mg/50ml solution for infusion bottles

Ciprofloxacin 100mg/50ml solution for infusion vials

This may be more specific than the description used in the non-dm+d database. Having access to check the stock held by the organisation may mean that it is possible to map the non-dm+d dictionary product to a single dm+d product. However the non-dm+d dictionary description should be updated in line with the dm+d product.

4.18. Branded presentations

Some drug dictionaries may include the name of a branded presentation for what is otherwise a generic product.

For example:

Salbutamol 100micrograms/dose inhaler CFC free Evohaler

Glucose 5% infusion 500ml Polyfusor

Where the intent is to represent a product with a branded presentation the descriptions should be mapped to the relevant AMP/AMPP concept in dm+d which describes that branded presentation.

Where the non-dm+d drug dictionary concept is intended to represent a generic product equivalent then it can be mapped to the VMP, but the non-dm+d dictionary term should be updated to remove the reference to the branded presentation.

4.19. Specials mapping guidance

Separate guidance specific to the mapping of Special Order products has been created. The document Secondary Care Guidance on Mapping to ‘Specials’ in dm+d and can be found here:

Publications & Resources - Delen: Home - NHS Digital (kahootz.com)

4.20. Extemporaneous preparations

dm+d does include a large number of Special Order products made by NHS Specials manufacturing units but due to the innumerable potential variations for extemporaneous formulations, it is not viable to represent all possibilities. In such cases, it may not be possible to map the non-dm+d drug dictionary description to dm+d. If there is a non-standard

‘Specials’ formulation which is absent from dm+d and for which there is repeated requirement for its use, e-mail the dm+d helpdesk at NHS BSA and this will be investigated for inclusion in dm+d.

4.21. Clinical Trials supplies

Supplies for double blind trials and studies where it is not possible to know the active ingredients of the item supplied cannot be mapped to dm+d.

4.22. Ancillary items

The scope of dm+d is to support the recording of items in a patient’s medical record. Some non-dm+d databases may include items such as labels, tablet cartons, bottles, and other items purchased for use in a pharmacy but not issued directly to patients. It will not be possible to map these items to dm+d.

4.23. Representation of colour or flavour

Non-dm+d descriptions may not include information about the colour or flavour for a product whereas dm+d does provide separate concepts for each option.

For example:

NovoPen Echo hypodermic insulin injection pen reusable for 3ml cartridge 0.5 unit dial up / range 0.5-30 units Red

Gaviscon Double Action Liquid aniseed

In these circumstances where only one option is stocked and therefore there is no ambiguity as to the product referred to by the non-dm+d description, it is possible to map the non-dm+d description to dm+d after checking local inventory. Where several options are stocked but represented by a non-specific local description it is not possible to create a map to a single dm+d concept.

5. Contacts

To Contact the authors of this document to provide feedback, ask questions, or propose additional contact the NHS Digital helpdesk at information.standards@nhs.net and include the words “dm+d mapping documentation” in the subject line.