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dm+d code system in NHS Terminology Server

February 2023

Published XX Month 2021

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| Document filename: | **dm+d Code System Structure Feb 2023** | | |
| Project / Programme | **Digital and Interoperable Medicines** | Project | **UK Medicines Terminology** |
| Document Reference | **Guide** | | |
|  |  | Status | **Published** |
| Owner | **Jo Goulding** | Version | **1.0** |
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# Important Notes

* **Ingredient Strength**: prior to April 2022 ingredient strength was not available for multi-ingredient drugs. After the release of Ingredient Strength information, in April 2022, the structure of the ingredient data recorded against VMP (active ingredients), and AMP (excipients) changed. See Ingredient Data – sub-properties section for more information about the ingredient structure.
* **GTIN**: GTIN (barcode) data became available in April 2022. See dm+d / GTIN mapping data section for further information about GTIN data.
* **dm+d Release Notes**: In April 2022, links to the dm+d release notes were made available. See dm+d Release Notes section for further information.
* **dm+d Historic Code Data:** In February 2023, the newly released dm+d Historic code data was made available on the Terminology Server. See dm+d Historic Code Mapping section for further information.

When releasing the new functionality above, it will be published with the latest version of dm+d. The historic data (7 weeks’ worth) will not be updated. Thus, for all available versions of dm+d on the terminology server to have the above functionality will take 7 weeks from the initial publication.

# Overview

This document is aimed at both technical and non-technical users of dm+d data and should be read before attempting to query dm+d data in the Terminology Server. It is assumed that readers will have some basic knowledge of the following:

* dm+d data and structure is understood, further information on dm+d; such as documentation, browser and webinars are available on the [NHS BSA website](https://www.nhsbsa.nhs.uk/pharmacies-gp-practices-and-appliance-contractors/dictionary-medicines-and-devices-dmd)
* An understanding of FHIR messaging and resources

Dictionary of medicines and devices (dm+d) data is available for download from [TRUD](https://isd.digital.nhs.uk/trud/user/guest/group/0/home). Throughout this document, the dm+d data on TRUD will be referred to as the dm+d XML data files. Initially, the dm+d XML data files will be the single source of truth; this means that the Terminology Server will not be loaded with the latest dm+d data until it is released on TRUD. There will be a short delay (approximately 1 hour) from when the dm+d XML files are released on TRUD (normally Monday morning) to when it is available in the terminology server. In the future this may change.

The dm+d data in the Terminology Server replicates the dm+d XML files as closely as possible. The dm+d XML files are not in [SNOMED CT RF2 format](https://confluence.ihtsdotools.org/display/DOCGLOSS/RF2), therefore on the Terminology Server the dm+d structure is very different from SNOMED CT UK Edition (which includes UK Drug Extension Data). Expression Constraint Language (ECL) queries **cannot** be run against the dm+d code system due to the structure differences. [Link to technical specification of dm+d XML files](https://www.nhsbsa.nhs.uk/sites/default/files/2023-01/Technical%20Specification%20of%20data%20files%20R2%20v3.2%20Jan%202023%20%28213KB%29.docx).

There are significant differences between dm+d and SNOMED CT UK Drug Extension ([follow this link to watch a video about the differences](https://www.youtube.com/watch?v=UGWjSNaJ7V4)), as a result, these two terminologies must be loaded as separate FHIR Terminology Code Systems. The code system identifier for dm+d is <https://dmd.nhs.uk>. This also affects the sharing of information with FHIR messaging as from UK Core (FHIR R4) in the UK. When a dm+d code is sent, using FHIR messaging, it must be identified with a system of <https://dmd.nhs.uk>.

The dm+d code system URL (<https://dmd.nhs.uk>) is planned to be a resolvable web page that will give further useful information about dm+d. There is no confirmed completion date for this work.

In a FHIR Terminology Server a Code System is the container for a version of a terminology or classification ([link to further information about Code Systems](https://www.hl7.org/fhir/codesystem.html)). SNOMED CT; ICD10; OPCS4; dm+d; etc are all in separate Code Systems.

# Clinical Risk Management

It is expected that all system suppliers comply with Clinical Risk Management Standards [DCB0126](https://digital.nhs.uk/data-and-information/information-standards/information-standards-and-data-collections-including-extractions/publications-and-notifications/standards-and-collections/dcb0129-clinical-risk-management-its-application-in-the-manufacture-of-health-it-systems) and [DCB0160](https://digital.nhs.uk/data-and-information/information-standards/information-standards-and-data-collections-including-extractions/publications-and-notifications/standards-and-collections/dcb0160-clinical-risk-management-its-application-in-the-deployment-and-use-of-health-it-systems). Suppliers are responsible for carrying out their own testing on the use and ingestion of dm+d data into their products. Please ensure system suppliers comply with these requirements.

# Authentication

To get access to the dm+d code systems on the Terminology Server systems are required to authenticate using OAuth2.0. OAuth2.0 is a common technical standard for authenticating over the internet and further detail is available on the internet.

Further information on how to access dm+d data is available on the [NHS England Terminology Server Web Pages](https://digital.nhs.uk/services/terminology-servers) (particularly useful are the quick start for beginners and the quick start for developers’ pages). There are two options: a user account (email address) or a System-to-System account (client id and secret).

When an authenticated user account accesses dm+d, it is standard OAuth practice that the access tokens are valid for a short period of time e.g. 15 minutes, after which re-authentication is required. Using Shrimp browser and Postman may require manual re-authentication. Alternatively, when implemented directly in an application the re-authentication can be done seamlessly without the user knowing.

# dm+d Code System Detail

The dm+d Code System can be viewed as a big bucket containing the dm+d data, so generic searches will be performed over all dm+d class concepts (VTM; VMP; AMP; etc). To be able to distinguish what type of dm+d class concept a drug code is, additional codes have been added to the dm+d Code System to support the grouping of dm+d data. The table below shows the code and description of these grouping codes. This table also shows the core concepts in the main dm+d Code System. There are “sub” dm+d Code Systems which is explained in the Multiple Code Systems section. These codes are in the dm+d Code System, but they do not exist (and will never exist) in the dm+d XML data files. They exist purely to group data in the dm+d Code System on the Terminology Server.

|  |  |  |
| --- | --- | --- |
| **Code** | **Description** | **Parent code** |
| dm+d | Dictionary of medicines and devices (dm+d) |  |
| VTM | Virtual Therapeutic Moiety | dm+d |
| VMP | Virtual Medicinal Product | dm+d |
| AMP | Actual Medicinal Product | dm+d |
| VMPP | Virtual Medicinal Product Pack | dm+d |
| AMPP | Actual Medicinal Product Pack | dm+d |
| FORM | Form | dm+d |
| ROUTE | Route | dm+d |
| INGREDIENT | Ingredient | dm+d |
| SUPPLIER | Supplier | dm+d |
| UOM | Unit of Measure | dm+d |

**Note**: the dm+d code is the parent code under which all dm+d codes can be found, and as a result is the only code that does not have any parents. All the dm+d concepts will have a parent of the relevant grouping code in the table above.

# Multiple Code Systems

Some dm+d lookup codes (Ingredient, Form, Route, Unit of Measure and Supplier) have SNOMED CT codes assigned to them. These dm+d codes have been included in the dm+d main code system (<https://dmd.nhs.uk>), as there will never be any duplication of codes these can exist in the same dm+d Code System.

dm+d has local lookup data (data from the dm+d lookup XML data file) which use the same codes (e.g. 1, 2, etc.) which mean different things dependant on the lookup category they exist in. Most of the lookup codes start at the code 1 and work up to 2, 3, and so on. Due to the duplicate identifiers, particularly 1, they each need to reside in their own code system so that there is no duplication of codes. Therefore, there are several additional “sub” code systems for the dm+d lookup data.

The Terminology Server will see the “sub” Code Systems as separate terminologies, however the URL identifiers for the dm+d “sub” Code Systems all start with the dm+d system URL of [https://dmd.nhs.uk/{subCodeSystemTag}](https://dmd.nhs.uk/%7bsubCodeSystemTag%7d) making it clear that they are all part of the same overall dm+d Code System. The {subCodeSystemTag} has been taken from the dm+d XML files. See APPENDIX 1 – dm+d “sub” Code Systems URLs.

# Inactive Codes

Since the introduction of the dm+d History Codes (see dm+d Historic Code Mapping) some dm+d codes are now flagged with the Terminology Server “inactive” property set to **true**.

All dm+d data from the XML files have an “inactive” property of **false**, including the dm+d INVALID concepts which will have an “INVALID” property with a value equal to one.

The inactive flag set to true shows that the code is no longer a current code in the dm+d XML files but is either a previous or “lost” code. These codes will have a display set to be the same as the code. This shows clearly that the code should not be used to describe a drug, but should be looked up in the history data.

When querying current dm+d data it is advised to include the ValueSet parameter ActiveOnly to true ([activeOnly=true](http://hl7.org/fhir/valueset-operation-expand.html#4.9.16.1)) to ensure only current dm+d drug codes are selected. If searching the terminology server for a dm+d code then set ActiveOnly to false ([activeOnly=false](http://hl7.org/fhir/valueset-operation-expand.html#4.9.16.1)) to ensure all codes are returned. If an inactive (inactive property is true) code is returned, then the history data should be searched to identify the current code.

# dm+d Codes and Names/Descriptions

The main data returned by the Terminology Server is:

* “system”: the code system the data is coming from
* “code”: the code being returned
* “display”: the name / description / preferred term that describes the code

In the dm+d XML files the dm+d code or the identifier in each table was the primary key in each table. In the terminology server this dm+d code is held as the code for each item. The display field is the Name (NM) field against a dm+d class concept, except where a description (DESC) field exists.

If there is an abbreviated term (ABBREVNM) then this will appear as a SYNONYM, and both are available to search using the “filter” parameter functionality.

# dm+d Properties

The additional dm+d data is available from the Terminology Server as properties. “Properties” is used because the FHIR messages return the additional information against a dm+d class concept (VTM; VMP; AMP; etc) as properties.

The properties have the same identifier as the tags in the dm+d XML files, this is for consistency with the dm+d XML files and the related documentation ([see dm+d XML files technical specification](https://www.nhsbsa.nhs.uk/sites/default/files/2023-01/Technical%20Specification%20of%20data%20files%20R2%20v3.2%20Jan%202023%20%28213KB%29.docx)). The loading of dm+d data into the Terminology Server has flattened the dm+d data and where possible, all data has been associated with the relevant dm+d class concepts (groupers: VTM; VMP; etc.). Details of which properties are assigned to which class concepts are available in APPENDIX 2 – Properties by dm+d Class Concepts.

Properties only exist in the Terminology Server if data is present. In the dm+d XML files where a concept is valid the INVALID flag will be set to NULL. In the Terminology Server the INVALID property will not exist against valid dm+d concepts, but the INVALID property will exist with the value of 1 for INVALID concepts.

**IMPORTANT NOTE:**

* The current active code for a dm+d class concept is now “code” and not VTMID; VPID; APID; etc.
* The ontology form route against the VMP concept has a different property name because it used the same XML tag (FORMCD) as the tag used to define the VMP’s actual form. FORMCD continues to represent the actual form of the VMP and the ontology form route code is now changed from FORMCD to ONTFORMCD.
* When retrieving a specific code using CodeSystem/$lookup the dm+d data is returned as a FHIR Parameters resource. The dm+d properties will be returned in a parameter with a name of “property” and the parts of the property define the type of property (NM; BS\_SUBID; SUPPCD; etc.) and the actual value of the property. The value of the property is returned in two formats. One with a name of “value” and another with a name that looks like name “value<FHIR data type>” (e.g. valueString or valueCoding). Our understanding is that the name of the format “value<FHIR data type> is deprecated and that developers should use the format where the name is “value”.

See APPENDIX 2 – Properties by dm+d Class Concepts for further detail.

# Navigating dm+d (parent; child)

The “parent” and “child” properties are probably the 2 most important properties as they facilitate the navigation of the dm+d 5 box data model hierarchy (see APPENDIX 4 – dm+d 5 box data model for an example diagram). It is assumed that the dm+d 5 box data model is understood.

“Parent” property has two uses:

1. To identify the type of dm+d class concept e.g. VTM; VMP; AMP; VMPP; AMPP; Ingredient; Form; Route; Supplier and Unit of Measure.
2. To allow the navigation of the dm+d 5 box data model hierarchy. For example:
   1. a VMP concept will have a parent link to the VTM concept if one exists.
   2. An AMPP concept will have a parent link to the AMP concept and VMPP concept.

“Child” property is used to identify those dm+d concepts associated with the selected concept. For example, a VTM concept will have zero, one or more VMP concept identifiers against the child property, a VMP concept will have one or more AMP concept identifiers and one or more VMPP concept identifiers against the child property.

# dm+d Release Notes

The dm+d release note URLs are linked to the root concept of the dm+d Code System, with a planned release of this functionality in April 2022. Prior to April 2022, the release notes will be available on the [NHS BSA website](https://www.nhsbsa.nhs.uk/pharmacies-gp-practices-and-appliance-contractors/dictionary-medicines-and-devices-dmd). Prior to January 2022, the release notes were only available from the dm+d XML file download from TRUD.

Two properties are assigned to the root dm+d concept that will hold URLs to the relevant release notes (dm+d and GTIN).

The dm+d root node has a code of “dm+d” and has display text of “Dictionary of medicines and devices (dm+d)”.

The properties have a code of:

* **dmdReleaseNote**: property that holds the URL to the dm+d release note.
* **GTINReleaseNote**: property that holds the URL to the GTIN release note.

**Important Note:**

* The NHS BSA loads the release notes on to their web site manually on a Monday morning or the day after a bank holiday(s). There may be a delay between the dm+d data being available in the Terminology Server and the release notes being available on the NHS BSA web site. If it is urgent to get the release notes, they are available on the TRUD website by downloading the dm+d XML files.

# Ingredient Data – sub-properties

In April 2022 the structure of the dm+d data changed to allow the clinically safe representation of the ingredient data in the dm+d code system. This affected the ingredient data returned when selecting a VMP (active ingredients) and AMP (excipient).

**Note**: As of 24th October 2022, dm+d release, the AMP interesting excipient ingredients are no longer populated and therefore cannot be represented in the Terminology Server.

To ensure the active ingredient data was clinically safe to be consumed by systems, the ingredient data had to be grouped together with each ingredient having its individual strength information associated.

For VMPs each active ingredient strength will be held under a single property with the code of “VPI”, same as the XML tag for grouping ingredient strength data in the XML files. The ingredient detail will be captured in this property as sub-properties. For VMPs with multiple active ingredients multiple “VPI” properties will exist, one “VPI” property for each active ingredient. See APPENDIX 2 – Properties by dm+d Class Concepts for the sub-properties that make up the active ingredient strength detail, they are highlighted in blue.

The VMP and AMP sub-properties act like the other dm+d properties and can be queried in the same way (e.g. searching for VMPs that contain a specific ingredient).

The structure of dm+d in the Terminology Server causes limitations when querying data. Some examples where limitations might occur are:

* If a query is required to return all dm+d VMP concepts that contain an active ingredient and only that ingredient it cannot be done using ingredient in the Terminology Server. For example, a query can be specified to return all VMPs that contain paracetamol as an active ingredient. This search would return VMP concepts with a single active ingredient of paracetamol, but also all multi-ingredient VMPs that had an ingredient of paracetamol. If this method was required, all VMP concepts would need to be returned and further filtering applied by the local code. The best method of doing this query would be with VTMs as each VTM means that the drugs associated to it contain only those active ingredients.
* Retrieve a specific strength of the ingredient, for example searching for drugs that contain the active ingredient of exactly 500mg of Amoxicillin. This would work for drugs with single active ingredients. However, for multiple active ingredient a record would be returned if Amoxicillin was one of the active ingredients and one of the other active ingredients had a strength numerator of 500 and another active ingredient with a strength numerator unit of measure of milligram. The best method of doing this kind of query would be to retrieve all drugs with an active ingredient of Amoxicillin and apply further filtering by the local code.

# dm+d ConceptMaps

The Terminology Server ConceptMaps are used to map codes from one code system to the same code system or to a different code system. dm+d has 2 ConceptMaps which are:

* dm+d previous codes to dm+d current code
* dm+d AMPP codes to GTIN codes (barcodes).

The Terminology Server supports the searching of one code at a time against a concept map. The Terminology Server also supports the FHIR standard of bundling multiple requests together in one request, this can be used when query multiple codes against a ConceptMap.

It is worth noting that ConceptMap structures are not normative in the FHIR specification. The Terminology Server is currently returning data in FHIR R4, but future versions of FHIR may cause breaking changes, but we will support vendors to minimise this impact.

## dm+d Historic Code Mapping

[dm+d Historic Data File Guide](https://nhsengland.kahootz.com/gf2.ti/f/762498/158728901.1/DOCX/-/dm_d%20and%20Historic%20Codes%20guide.docx) gives detailed information about dm+d historic data.

dm+d Historic Code Data was added to the terminology server on 27th February 2023 and is stored in the Terminology Server as a concept map identified by the URL <https://dmd.nhs.uk/conceptmap/history>. So that the Terminology Server knows which concept map is being search it is very strongly recommended to specify the URL of the concept map.

url=https://dmd.nhs.uk/conceptmap/history

The main use case for dm+d Historic Code Data is searching for a dm+d code (current or previous) to find out what the current dm+d code is. The dm+d Historic Concept Map was built with this use case in mind, that is the Previous codes (can be current or previous codes) Map on to the Current code.

The forward search is when searching for a previous code (could be the current code) to identify what the current code is. The current code and description will be returned along with when the dates when the previous code (the one being searched for) was the active code. If no end date exists, then the previous code being searched for is the current code.

The reverse search is when searching for a current code, all previous and current codes will be returned along with the start and end date when the previous codes were active. If a code does not have an end date, then it is the current code.

The mapping is from the dm+d code system to the dm+d code system, this means the source and target code systems are both dm+d (<https://dmd.nhs.uk>).

When querying concepts maps the additional fields (start and end date) cannot be searched.

Further detail on querying the dm+d Historic Concept Map can be found in APPENDIX 5 – dm+d Historic Code Concept Map fields.

Only dm+d codes that are susceptible to change (VTM, VMP, Ingredients, Form, Route, Supplier and Units of Measure) are in the Historic data. The other codes (AMP, VMPP, AMPP, etc.) are not included as their codes will never change.

Current dm+d data, that is the data from the core dm+d XML files will have a FHIR inactive property of false. This includes dm+d INVALID concepts that will have an INVALID property with a value of 1. Previous codes, those codes that are not current dm+d codes will have FHIR inactive property of true and a display text set to be the same as the code, this shows that the code should not be used to represent a drug and to identify what the drug was the history data should be used.

## dm+d / GTIN mapping data

The dm+d to GTIN (barcode) mapping data available in the dm+d XML files, maps dm+d AMPP identifiers to GTIN codes along with start date and end date of when the code is valid. If no end date is given the mapping is currently active.

The dm+d to GTIN mapping data was added to the Terminology Server in April 2022. The mapping between codes is returned by querying the Terminology Server’s ConceptMap.

Further information about the fields returned when querying codes is available in APPENDIX 3 – dm+d to GTIN ConceptMap fields.

When searching dm+d / GTIN concept map the mapping will work both ways, that is search by AMPP identifiers to get a zero to many GTIN code matches and conversely search by a GTIN code to identify a zero to many AMPP identifier matches.

Additional fields (start date, end date and mapping status) cannot be queried using the Terminology Server’s ConceptMap. If a use case is required to search by any of these fields the relevant fields would need to be returned and filtered in the local code.

The mapping status field returns “active” (no end date) or “retired” (end date exists). This field is calculated when the data is loaded into the Terminology Server.

When specifying a code being search the Terminology server needs to know the system (code system) of the code being searched.

* dm+d system URL: <https://dmd.nhs.uk>
* GTIN system URL: <https://www.gs1.org/gtin>

It is strongly recommended that when querying the ConceptMap to include the URL of the concept map being queried, this ensures that the correct results will always be returned. The URL for the dm+d / GTIN map is: <https://dmd.nhs.uk/conceptmap/gtin>.

url=https://dmd.nhs.uk/conceptmap/gtin

# Querying dm+d data

There is a [Github of example Terminology Server calls](https://github.com/NHSDigital/TerminologyServer). This link is specific to [dm+d example RESTful http requests](https://github.com/NHSDigital/TerminologyServer/tree/main/codesnippets/Content%20specific/dmd).

# Known Issues

1. **Duplication of five codes**: Back in 2006 five dm+d codes were duplicated across VTM; AMP; VMPP and AMPP class concepts. These five duplicated codes (10 concepts in all) were valid for a week before they were all made INVALID. Due to the FHIR Terminology Server not allowing the duplication of codes in a code system, the five VTM codes do not exist in the Terminology Server but do exist in the dm+d XML data. The codes are listed by dm+d class concepts below. The decision to not include these concepts has been clinically reviewed and the risk was felt to be low.

When the historic data was added in February 2023 the VTM data listed below was removed because the VTMs do not exist on the Terminology Server.

**VTM:**

|  |  |  |
| --- | --- | --- |
| VTMID | NM | INVALID |
| 9854411000001103 | Medium chain triglycerides - invalid | 1 |
| 9854511000001104 | Calcium + Magnesium | 1 |
| 9854611000001100 | Ichthammol + Zinc | 1 |
| 9854711000001109 | Amiloride + Cyclopenthiazide - invalid | 1 |
| 9854911000001106 | Meglumine amidotrizoate + Sodium amidotrizoate - invalid | 1 |

**VMPs:**

None

**AMP:**

|  |  |  |
| --- | --- | --- |
| APID | DESC | INVALID |
| 9854511000001104 | Gel-X tablets (Oakmed Ltd) | 1 |

**VMPP:**

|  |  |  |
| --- | --- | --- |
| VPPID | NM | INVALID |
| 9854611000001100 | Ostomy discharge solidifying agents 140 tablet | 1 |
| 9854911000001106 | International normalised ratio testing strips 24 strip | 1 |

**AMPP:**

|  |  |  |
| --- | --- | --- |
| APPID | NM | INVALID |
| 9854411000001103 | Smartflow drainable night drainage bag NB2 2litre, 120cm tube (Manfred Sauer UK Ltd) 10 device | 1 |
| 9854711000001109 | Gel-X tablets (Oakmed Ltd) 140 tablet | 1 |

1. **Additional Duplicated Code**: When the Historic Data was added in February 2023 an additional duplicated code was identified. Further information on this can be found in the [dm+d History Data File Guide](https://nhsengland.kahootz.com/gf2.ti/f/762498/158728901.1/DOCX/-/dm_d%20and%20Historic%20Codes%20guide.docx) see section “Known Issues” point 2.

# Frequently Asked Questions (FAQ)

## Lookup codes are “0001” in XML files, but “1” in the Terminology Server.

The data is loaded into the Terminology Server using the XSD files supplied along with the dm+d XML data files. It is these XSD files that specifies these codes to be integers. In summary the data is loaded into the Terminology Server using the standard XSD files that are released along with dm+d XML data, therefore it is following the specified standards.

## Is the Terminology Server going to supersede the dm+d XML data files?

The dm+d XML data files will remain the primary source of dm+d for the foreseeable future. There is no plan to get rid of the dm+d XML files as these are used to populate the Terminology Server. However, we cannot exclude the possibility that the dm+d XML files will not be superseded by something else in the future. To deprecate the dm+d XML files would require retooling within NHS England. NHS England also supports implementers of dm+d, so there would be a long period of consultation with users of dm+d data before deprecating the dm+d XML data files.

## The ingredient data is not returned in alphabetical order.

The order the API returns the ingredient data is not significant. Sorting of the returned data is a use case specific function and is the role of the user interface to present the data in the order required to meet the user requirements.

## When returning a value set query, designation information is not returned.

When data is returned as a value set, the designation detail is NOT returned by default. To get the designation detail to be returned as part of value set the following parameter will need to be included in the request call:

includeDesignations=true

# APPENDIX 1 – dm+d “sub” Code Systems URLs

|  |  |
| --- | --- |
| **CodeSystem URL** | **Description** |
| https://dmd.nhs.uk/COMBINATION\_PACK\_IND | Code descriptions for AMPP/VMPP combination indicator |
| https://dmd.nhs.uk/COMBINATION\_PROD\_IND | Code descriptions for AMP/VMP combination indicator |
| https://dmd.nhs.uk/BASIS\_OF\_NAME | Code descriptions for VMP name basis |
| https://dmd.nhs.uk/NAMECHANGE\_REASON | Code descriptions for VMP name change reason |
| https://dmd.nhs.uk/VIRTUAL\_PRODUCT\_PRES\_STATUS | Code descriptions for VMP prescribing status |
| https://dmd.nhs.uk/CONTROL\_DRUG\_CATEGORY | Code descriptions for controlled drug category |
| https://dmd.nhs.uk/LICENSING\_AUTHORITY | Code descriptions for licensing authority |
| https://dmd.nhs.uk/ONT\_FORM\_ROUTE | Code descriptions for ontology form route (VMP Form & Route) combinations |
| https://dmd.nhs.uk/DT\_PAYMENT\_CATEGORY | Code descriptions for Drug Tariff categories |
| https://dmd.nhs.uk/FLAVOUR | Code descriptions for flavours |
| https://dmd.nhs.uk/COLOUR | Code descriptions for colours |
| https://dmd.nhs.uk/BASIS\_OF\_STRNTH | Code descriptions for basis of strength |
| https://dmd.nhs.uk/REIMBURSEMENT\_STATUS | Code descriptions for reimbursement status |
| https://dmd.nhs.uk/SPEC\_CONT | Code descriptions for special container indicator |
| https://dmd.nhs.uk/DND | Code descriptions for Discount Not Deducted indicator |
| https://dmd.nhs.uk/VIRTUAL\_PRODUCT\_NON\_AVAIL | VMP non availability of VMP status codes |
| https://dmd.nhs.uk/DISCONTINUED\_IND | Code descriptions for discontinued indicator |
| https://dmd.nhs.uk/DF\_INDICATOR | Code descriptions for Dose form indicator |
| https://dmd.nhs.uk/PRICE\_BASIS | Code descriptions for basis of AMPP price |
| https://dmd.nhs.uk/LEGAL\_CATEGORY | Code descriptions for AMPP legal category |
| https://dmd.nhs.uk/AVAILABILITY\_RESTRICTION | Code descriptions for AMP availability restriction |
| https://dmd.nhs.uk/LICENSING\_AUTHORITY\_CHANGE\_REASON | Code descriptions for licensing authority change reason |

# APPENDIX 2 – Properties by dm+d Class Concepts

It is assumed that dm+d concept classes VTM; VMP; AMP; Ingredient; Supplier etc. are all understood.

Note for all dm+d concepts:

1. Code will always be the primary key for the concept.
2. Display will always be the dm+d name field (NM), except where a description field exists (DESC)
3. Where an abbreviated name (ABBREVNM) exists, it will appear as a synonym.
4. To identify the dm+d class use the parent property.

**dm+d Root Node (code: dm+d):**

|  |  |  |  |
| --- | --- | --- | --- |
| **Property Name** | **Lookup Code System** | **Cardinality** | **Comment** |
| dmdReleaseNote |  | 1..1 | Holds URL to the dm+d release notes |
| GTINReleaseNote |  | 1..1 | Holds URL to the GTIN release notes |

**VTM Properties:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Property Name** | **Lookup Code System** | **Cardinality** | **Comment** |
| parent |  | 1..1 | Link to parent concepts, this will be to the grouper code of VTM. |
| child |  | 0..\* | Links to children concepts VMPs |
| INVALID |  | 0..1 | 1 = INVALID, property will not be present if VALID |
| VTMIDPREV |  | 0..1 | VTM ID has changed; this is the previous ID. |
| VTMIDDT |  | 0..1 | Date that the VTM ID changed. |

**VMP Properties:**

VMP Important Notes:

* The active ingredients are stored as sub-properties because the ingredient and its relevant strength must be grouped together to be clinically safe. In the table below the Ingredient Strength information is highlighted in blue. The ingredient strength information will be contained in a single property with a code of “VPI”. There will be sub-properties within this property which identify the different fields / code that make up the active ingredient strength.

| **Property Name** | **Lookup Code System** | **Cardinality** | **Comment** |
| --- | --- | --- | --- |
| parent |  | 1..2 | Parent concepts grouper (VMP) and to a VTM identifier where one exists. |
| child |  | 0..\* | Children of a VMP can be AMPs and VMPPs. Children cannot be differentiated between AMP or VMPPs from the VMP data. |
| BASIS\_PREVCD | [https://dmd.nhs.uk/BASIS\_OF\_NAME](http://digital.nhs.uk/fhir/CodeSystem/dmd/BASIS_OF_NAME) | 0..1 | The basis that was used to define the dm+d previous name (NMPREV). If the name has not changed this will not be populated.  VMP.BASIS\_PREVCD |
| BASISCD | [https://dmd.nhs.uk/BASIS\_OF\_NAME](http://digital.nhs.uk/fhir/CodeSystem/dmd/BASIS_OF_NAME) | 1..1 | The basis that was used to define the dm+d name.  VMP.BASISCD |
| CAT\_PREVCD | [https://dmd.nhs.uk/CONTROL\_DRUG\_CATEGORY](http://digital.nhs.uk/fhir/CodeSystem/dmd/CONTROL_DRUG_CATEGORY) | 0..1 | When controlled drug category code changes this captures the previous controlled drug category. Only populated if the controlled drug category has changed.  CONTROL\_INFO.VPID  CONTROL\_INFO.CAT\_PREVCD |
| CATCD | [https://dmd.nhs.uk/CONTROL\_DRUG\_CATEGORY](http://digital.nhs.uk/fhir/CodeSystem/dmd/CONTROL_DRUG_CATEGORY) | 1..1 | Controlled drug category code  CONTROL\_INFO.VPID  CONTROL\_INFO.CATCD |
| CATDT |  | 0..1 | Date that the controlled drug category changes. Only populated if there is a CAT\_PREVCD  CONTROL\_INFO.VPID  CONTROL\_INFO.CATDT |
| CFC\_F |  | 0..1 | Identifies if a VMP is CFC free. CFC\_F = 1 if VMP is CFC free otherwise the property is not populated.  VMP.CFC\_F |
| COMBPRODCD | [https://dmd.nhs.uk/COMBINATION\_PROD\_IND](http://digital.nhs.uk/fhir/CodeSystem/dmd/COMBINATION_PROD_IND) | 0..1 | Identifies if the VMP is a combination product or a component only product.  VMP.COMBPRODCD |
| DF\_INDCD | [https://dmd.nhs.uk/DF\_INDICATOR](http://digital.nhs.uk/fhir/CodeSystem/dmd/DF_INDICATOR) | 1..1 | Dose form indication code.  VMP.DF\_INDCD |
| FORMCD |  | 0..1 | Drug form, links to a dm+d form code in the dm+d code system.  DRUG\_FORM.VPID  DRUG\_FORM.FORMCD |
| GLU\_F |  | 0..1 | Identifies if VMP is gluten free. GLU\_F = 1 when VMP is gluten free. Otherwise this property is not populated.  VMP.GLU\_F |
| INVALID |  | 0..1 | Valid VMPs will not have this property.  INVALID concepts have INVALID = 1 |
| NMCHANGECD | [https://dmd.nhs.uk/NAMECHANGE\_REASON](http://digital.nhs.uk/fhir/CodeSystem/dmd/NAMECHANGE_REASON) | 0..1 | Reason for name change, if specified.  VMP.NMCHANGECD |
| NMDT |  | 0..1 | Date that the name changed in dm+d. If the name has not changed this property will not be populated.  VMP.NMDT |
| NMPREV |  | 0..1 | When the name has changed this property holds what the previous name was. If the name has not changed this property will not be populated.  VMP.NMPREV |
| NON\_AVAILCD | [https://dmd.nhs.uk/VIRTUAL\_PRODUCT\_NON\_AVAIL](http://digital.nhs.uk/fhir/CodeSystem/dmd/VIRTUAL_PRODUCT_NON_AVAIL) | 0..1 | Non availability of actual products. If the property does not exist, the product is available.  VMP.NON\_AVAILCD |
| NON\_AVAILDT |  | 0..1 | Date product was set to be not available. |
| ONTFORMCD | [https://dmd.nhs.uk/ONT\_FORM\_ROUTE](http://digital.nhs.uk/fhir/CodeSystem/dmd/ONT_FORM_ROUTE) | 0..\* | Ontology route form.  Note the property name in Terminology Server is different from the dm+d XML files because this clashed with the FORMCD, thus in the Terminology Server this will have the name ONTFORMCD.  ONT\_DRUG\_FORM.VPID  ONT\_DRUG\_FORM.FORMCD |
| PRES\_F |  | 0..1 | Identifies if the VMP is preservative free. PRES\_F = 1 when the VMP is preservative free and will not be populated otherwise.  VMP.PRES\_F |
| PRES\_STATCD | [https://dmd.nhs.uk/VIRTUAL\_PRODUCT\_PRES\_STATUS](http://digital.nhs.uk/fhir/CodeSystem/dmd/VIRTUAL_PRODUCT_PRES_STATUS) | 1..1 | Virtual product prescribing status.  VMP.PRES\_STATCD |
| ROUTECD |  | 0..\* | Drug route, links to dm+d route code in the dm+d code system.  DRUG\_ROUTE.VPID  DRUG\_ROUTE.ROUTECD |
| UDFS |  | 0..1 | Unit dose form size value. This is only populated when the DF\_INDCD = 1.  VMP.UDFS |
| UDFS\_UOMCD |  |  | Unit dose form size unit of measure. This is only populated when the DF\_INDCD = 1.  This code links to the dm+d unit of measure code in the dm+d code system.  VMP.UDFS\_UOMCD |
| UNIT\_DOSE\_UOMCD |  |  | Unit dose unit of measure. This is only populated when the DF\_INDCD = 1.  This code links to the dm+d unit of measure code in the dm+d code system.  VMP.UNIT\_DOSE\_UOMCD |
| VPIDDT |  | 0..1 | Date that the VMP.VPID (code in Terminology Server) changed.  VMP.VPIDDT |
| VPIDPREV |  | 0..1 | The previous VMP.VPID for this VMP. |
| ISID |  | 0..\* | Active ingredient(s) of VMPs, links to dm+d ingredient code in the dm+d code system.  VPI.VPID  VPI.ISID |
| BS\_SUBID |  |  | Links to dm+d ingredient data in the dm+d code system.  VPI.VPID  VPI.BS\_SUBID |
| BASIS\_STRNTCD | [https://dmd.nhs.uk/BASIS\_OF\_STRNTH](http://digital.nhs.uk/fhir/CodeSystem/dmd/BASIS_OF_STRNTH) | 0..1 | Basis of strength.  VPI.VPID  VPI.BASIS\_STRNTCD |
| STRNT\_DNMTR\_UOMCD |  | 0..1 | Active ingredient strength denominator unit of measure code. Not all active ingredients have a denominator, in these instances it will not exist.  This code links to the dm+d unit of measure code in the dm+d code system.  VPI.VPID  VPI. STRNT\_DNMTR\_UOMCD |
| STRNT\_DNMTR\_VAL |  | 0..1 | Active ingredient strength denominator value. Not all active ingredients have a denominator, in these instances it will not exist.  VPI.VPID  VPI. STRNT\_DNMTR\_VAL |
| STRNT\_NMRTR\_UOMCD |  | 0..1 | Active ingredient strength numerator unit of measure code.  This code links to the dm+d unit of measure code in the dm+d code system.  VPI.VPID  VPI. STRNT\_NUMRTR\_UOMCD |
| STRNT\_NMRTR\_VAL |  | 0..1 | Active ingredient strength numerator value.  VPI.VPID  VPI. STRNT\_NUMRTR\_VAL |

**AMP Properties:**

AMP Important Notes:

* Interesting excipients are no longer released in the dm+d XML data files (as of 24th October 2022 dm+d release), therefore the ISID data is no longer populated for AMPs.

| **Property Name** | **Lookup Code System** | **Cardinality** | **Comment** |
| --- | --- | --- | --- |
| parent |  | 2..2 | Parent concepts are:   * Grouper identifier (AMP) * AMP.VPID |
| child |  | 0..\* | Children of an AMP are AMPPs |
| AVAIL\_RESTRICTCD | [https://dmd.nhs.uk/AVAILABILITY\_RESTRICTION](http://digital.nhs.uk/fhir/CodeSystem/dmd/AVAILABILITY_RESTRICTION) | 1..1 | Availability restriction code  AMP.AVAIL\_RESTRICTCD |
| COLOURCD | [https://dmd.nhs.uk/COLOUR](http://digital.nhs.uk/fhir/CodeSystem/dmd/COLOUR) | 0..1 | Colour identifier  AP\_INFORMATION.APID  AP\_INFORMATION.COLOURCD |
| COMBPRODCD | [https://dmd.nhs.uk/COMBINATION\_PROD\_IND](http://digital.nhs.uk/fhir/CodeSystem/dmd/COMBINATION_PROD_IND) | 0..1 | Combination product flag.  AMP.COMBPRODCD |
| EMA |  | 0..1 | European Medicines Agency (EMA) additional monitoring indicator (black triangle). EMA = 1 if additional monitoring required, not present otherwise.  AMP.EMA |
| FLAVOURCD | [https://dmd.nhs.uk/FLAVOUR](http://digital.nhs.uk/fhir/CodeSystem/dmd/FLAVOUR) | 0..1 | Flavour identifier  AMP.FLAVOURCD |
| ISID |  | 0..\* | Excipient ingredients, links to the dm+d ingredient data in the dm+d code system (**no longer populated**).  AP\_INGREDIENT.APID  AP\_INGREDIENT.ISID |
| INVALID |  | 0..1 | Valid AMP will not have this property.  INVALID concepts have INVALID = 1 |
| LIC\_AUTH\_PREVCD | [https://dmd.nhs.uk/LICENSING\_AUTHORITY](http://digital.nhs.uk/fhir/CodeSystem/dmd/LICENSING_AUTHORITY) | 0..1 | Previous licensing authority, only present if the licensing authority has changed.  AMP.LIC\_AUTH\_PREVCD |
| LIC\_AUTHCD | [https://dmd.nhs.uk/LICENSING\_AUTHORITY](http://digital.nhs.uk/fhir/CodeSystem/dmd/LICENSING_AUTHORITY) | 1..1 | Licensing authority identifier  AMP.LIC\_AUTHCD |
| LIC\_AUTHCHANGECD | [https://dmd.nhs.uk/LICENSING\_AUTHORITY\_CHANGE\_REASON](http://digital.nhs.uk/fhir/CodeSystem/dmd/LICENSING_AUTHORITY_CHANGE_REASON) | 0..1 | Reason for licensing authority change.  AMP.LIC\_AUTHCHANGECD |
| LIC\_AUTHCHANGEDT |  | 0..1 | Date the licensing authority changed.  AMP.LIC\_AUTHCHANGEDT |
| NM\_PREV |  | 0..1 | Previous Name  AMP.NM\_PREV |
| NMDT |  | 0..1 | Date the name was changed.  AMP.NMDT |
| PARALLEL\_IMPORT |  | 0..1 | Parallel import indicator. PARALLEL\_IMPORT = 1 if an AMP is a parallel import and not present otherwise. |
| PROD\_ORDER\_NO |  | 0..1 | AMP product order number  AP\_INFORMATION.APID  AP\_INFORMATION.PROD\_ORDER\_NO |
| ROUTECD |  | 0..\* | The licensed route for an AMP. Links to the dm+d routes in the dm+d code system.  LICENSED\_ROUTE.APID  LICENSED\_ROUTE.ROUTECD |
| SUPPCD |  | 1..1 | Supplier code, links to the dm+d supplier information in the dm+d code system.  AMP.SUPPCD |
| SZ\_WEIGHT |  | 0..1 | AMP size / weight. Text field  AP\_INFORMATION.APID  AP\_INFORMATION.SZ\_WEIGHT |

**VMPP Properties:**

| **Property Name** | **Lookup Code System** | **Cardinality** | **Comment** |
| --- | --- | --- | --- |
| parent |  | 2..2 | Parent concepts are:   * Grouper identifier (VMPP) * VMPP.VPID |
| child |  | 0..\* | Children of a VMPP are AMPPs |
| COMBPACKCD | [https://dmd.nhs.uk/COMBINATION\_PACK\_IND](http://digital.nhs.uk/fhir/CodeSystem/dmd/COMBINATION_PACK_IND) | 0..1 | Combination pack indicator  VMPP.COMBPACKCD |
| DT |  | 0..1 | Date drug tariff price changed. If the price has not changed this property will not be present.  DRUG\_TARIFF\_INFO.VPPID  DRUG\_TARIFF\_INFO.DT |
| INVALID |  | 0..1 | Valid VMPP will not have this property.  INVALID concepts have INVALID = 1 |
| PAY\_CATCD | [https://dmd.nhs.uk/DT\_PAYMENT\_CATEGORY](http://digital.nhs.uk/fhir/CodeSystem/dmd/DT_PAYMENT_CATEGORY) |  | Drug tariff payment category code.  DRUG\_TARIFF\_INFO.VPPID  DRUG\_TARIFF\_INFO.PAY\_CATCD |
| PREVPRICE |  | 0..1 | Drug tariff previous price  DRUG\_TARIFF\_INFO.VPPID  DRUG\_TARIFF\_INFO.PREVPRICE |
| PRICE |  | 0..1 | Drug tariff current price  DRUG\_TARIFF\_INFO.VPPID  DRUG\_TARIFF\_INFO.PRICE |
| QTY\_UOMCD |  | 1..1 | Quantity unit of measure, links to the dm+d unit of measure data in the dm+d code system.  VMPP.QTY\_UOMCD |
| QTYVAL |  | 1..1 | Quantity Value  VMPP.QTYVAL |

**AMPP Properties:**

AMPP Important Notes:

* The Nurse Extended formulary ENURSE\_F was discontinued in April 2006 and will not be available on the Terminology Server.
* Limited stability (LTD\_STAB): the drug tariff no longer identifies products for this purpose, and they are no longer populated.

| **Property Name** | **Lookup Code System** | **Cardinality** | **Comment** |
| --- | --- | --- | --- |
| parent |  | 3..3 | Parent concepts are:   * Grouper identifier (AMPP) * AMPP.VPPID * AMPP.APID   The parents are not identifiable as AMP or VMPP codes from the AMPP concept |
| child |  | 0..0 | AMPPs are the most detailed concepts and therefore do not have any children. |
| ACBS |  | 0..1 | Advisory Committee on Borderline Substances (ACBS) Indicator  DRUG\_PRODUCT\_PRESCRIB\_INFO.APPID  DRUG\_PRODUCT\_PRESCRIB\_INFO.ACBS |
| BB |  | 0..1 | Broken bulk indicator  REIMBURSEMENT\_INFO.APPID  REIMBURSEMENT\_INFO.BB |
| CAL\_PACK |  | 0..1 | Calendar pack indicator  REIMBURSEMENT\_INFO.APPID  REIMBURSEMENT\_INFO.CAL\_PACK |
| COMBPACKCD | [https://dmd.nhs.uk/COMBINATION\_PACK\_IND](http://digital.nhs.uk/fhir/CodeSystem/dmd/COMBINATION_PACK_IND) | 0..1 | Combination pack indicator  AMPP.COMBPACKCD |
| DENT\_F |  | 0..1 | Dental formulary indicator. If appropriate for a dental formulary DENT\_F = 1 otherwise the property will not be present.  DRUG\_PRODUCT\_PRESCRIB\_INFO.APPID  DRUG\_PRODUCT\_PRESCRIB\_INFO.DENT\_F |
| DISCCD | [https://dmd.nhs.uk/DISCONTINUED\_IND](http://digital.nhs.uk/fhir/CodeSystem/dmd/DISCONTINUED_IND) | 0..1 | Discontinued code. If the property is not present the AMPP is still available (**not** discontinued).  AMPP.DISCCD |
| DISCDT |  | 0..1 | Discontinued date. If the property is not present the AMPP is still available (**not** discontinued).  AMPP.DISCDT |
| DISP\_FEES |  | 0..1 | Dispensing fees.  REIMBURSEMENT\_INFO.APPID  REIMBURSEMENT\_INFO.DISP\_FEES |
| DND | [https://dmd.nhs.uk/DND](http://digital.nhs.uk/fhir/CodeSystem/dmd/DND) | 0..1 | Discount not deducted indicator.  DRUG\_PRODUCT\_PRESCRIB\_INFO.APPID  DRUG\_PRODUCT\_PRESCRIB\_INFO.DND |
| FP10\_MDA |  | 0..1 | FP10 MDA prescription indicator  DRUG\_PRODUCT\_PRESCRIB\_INFO.APPID  DRUG\_PRODUCT\_PRESCRIB\_INFO.FP10\_MDA |
| FP34D |  | 0..1 | FP34D prescription item indicator  DRUG\_PRODUCT\_PRESCRIB\_INFO.APPID  DRUG\_PRODUCT\_PRESCRIB\_INFO.FP34D |
| HOSP |  | 0..1 | Hospital indicator  DRUG\_PRODUCT\_PRESCRIB\_INFO.APPID  DRUG\_PRODUCT\_PRESCRIB\_INFO.HOSP |
| INVALID |  | 0..1 | Valid AMPP will not have this property.  INVALID concepts have INVALID = 1 |
| LEGAL\_CATCD | [https://dmd.nhs.uk/LEGAL\_CATEGORY](http://digital.nhs.uk/fhir/CodeSystem/dmd/LEGAL_CATEGORY) | 1..1 | Legal category code.  AMPP.LEGAL\_CATCD |
| NURSE\_F |  | 0..1 | Nurse formulary indication. If appropriate for a Nurse formulary NURSE\_F = 1 otherwise the property will not be present.  DRUG\_PRODUCT\_PRESCRIB\_INFO.APPID  DRUG\_PRODUCT\_PRESCRIB\_INFO.NURSE\_F |
| PACK\_ORDER\_NO |  | 0..1 | Pack order number.  APPLIANCE\_PACK\_INFO.APPID  APPLIANCE\_PACK\_INFO.PACK\_ORDER\_NO |
| PADM |  | 0..1 | Personally administered indicator  DRUG\_PRODUCT\_PRESCRIB\_INFO.APPID  DRUG\_PRODUCT\_PRESCRIB\_INFO.PADM |
| PRICE |  | 0..1 | Indicative price of AMPP  MEDICINAL\_PRODUCT\_PRICE.APPID  MEDICINAL\_PRODUCT\_PRICE.PRICE |
| PRICE\_BASISCD | [https://dmd.nhs.uk/PRICE\_BASIS](http://digital.nhs.uk/fhir/CodeSystem/dmd/PRICE_BASIS) | 1..1 | MEDICINAL\_PRODUCT\_PRICE.APPID  MEDICINAL\_PRODUCT\_PRICE.PRICE\_BASISCD |
| PRICE\_PREV |  | 0..1 | Previous indicative price of AMPP  MEDICINAL\_PRODUCT\_PRICE.APPID  MEDICINAL\_PRODUCT\_PRICE.PRICE\_PREV |
| PRICEDT |  | 0..1 | Date AMPP indicative price changed.  MEDICINAL\_PRODUCT\_PRICE.APPID  MEDICINAL\_PRODUCT\_PRICE.PRICEDT |
| PX\_CHRGS |  | 0..1 | Prescription charges.  REIMBURSEMENT\_INFO.APPID  REIMBURSEMENT\_INFO.PX\_CHRGS |
| REIMB\_STATCD | [https://dmd.nhs.uk/REIMBURSEMENT\_STATUS](http://digital.nhs.uk/fhir/CodeSystem/dmd/REIMBURSEMENT_STATUS) | 0..1 | Appliance reimbursement status code.  APPLIANCE\_PACK\_INFO.APPID  APPLIANCE\_PACK\_INFO.REIMB\_STATCD |
| REIMB\_STATDT |  | 0..1 | Date appliance reimbursement status became effective.  APPLIANCE\_PACK\_INFO.APPID  APPLIANCE\_PACK\_INFO.REIMB\_STATDT |
| REIMB\_STATPREVCD |  | 0..1 | Appliance reimbursement previous status code.  APPLIANCE\_PACK\_INFO.APPID  APPLIANCE\_PACK\_INFO.REIMB\_STATPREVCD |
| SCHED\_1 |  | 0..1 | Schedule 1 indicator.  DRUG\_PRODUCT\_PRESCRIB\_INFO.APPID  DRUG\_PRODUCT\_PRESCRIB\_INFO.SCHED\_1 |
| SCHED\_2 |  | 0..1 | Schedule 2 indicator.  DRUG\_PRODUCT\_PRESCRIB\_INFO.APPID  DRUG\_PRODUCT\_PRESCRIB\_INFO.SCHED\_2 |
| SPEC\_CONTCD | [https://dmd.nhs.uk/SPEC\_CONT](http://digital.nhs.uk/fhir/CodeSystem/dmd/SPEC_CONT) | 0..1 | Special container indicator  REIMBURSEMENT\_INFO.APPID  REIMBURSEMENT\_INFO.SPEC\_CONTCD |
| SUBP |  | 0..1 | Sub pack information, text.  AMPP.SUBP |

**Ingredient Properties:**

| **Property Name** | **Lookup Code System** | **Cardinality** | **Comment** |
| --- | --- | --- | --- |
| parent |  | 1..1 | Parent concepts are:   * Grouper identifier (INGREDIENT) |
| child |  | 0..0 | Ingredients do not have any children. |
| ISIDDT |  | 0..1 | Date ingredient substance identifier became valid. When ISID code has changed, if the code has not changed this field is not populated. |
| ISIDPREV |  | 0..1 | Previous ingredient substance identifier. |
| INVALID |  | 0..1 | Valid Ingredient will not have this property.  INVALID concepts have INVALID = 1 |

**Supplier Properties:**

| **Property Name** | **Lookup Code System** | **Cardinality** | **Comment** |
| --- | --- | --- | --- |
| parent |  | 1..1 | Parent concepts are:   * Grouper identifier (SUPPLIER) |
| child |  | 0..0 | Supplier concepts do not have any children. |
| CDDT |  | 0..1 | Date supplier code became valid. If supplier code has not changed this field is not populated. |
| CDPREV |  | 0..1 | Previous supplier code |
| INVALID |  | 0..1 | Valid supplier will not have this property.  INVALID concepts have INVALID = 1 |

**Unit of Measure Properties:**

| **Property Name** | **Lookup Code System** | **Cardinality** | **Comment** |
| --- | --- | --- | --- |
| parent |  | 1..1 | Parent concepts are:   * Grouper identifier (UOM) |
| child |  | 0..0 | Units of measure concepts do not have any children. |
| CDDT |  | 0..1 | Date unit of measure code became valid. If unit of measure code has not changed this field is not populated. |
| CDPREV |  | 0..1 | Previous unit of measure code. |

**Route Properties:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Property Name** | **Lookup Code System** | **Cardinality** | **Comment** |
| parent |  | 1..1 | Parent concepts are:   * Grouper identifier (ROUTE) |
| child |  | 0..0 | Route concepts do not have any children. |
| CDDT |  | 0..1 | Date route code became valid. If route code has not changed this field is not populated. |
| CDPREV |  | 0..1 | Previous route code. |

**Form Properties:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Property Name** | **Lookup Code System** | **Cardinality** | **Comment** |
| Parent |  | 1..1 | Parent concepts are:   * Grouper identifier (FORM) |
| child |  | 0..0 | Form concepts do not have any children. |
| CDDT |  | 0..1 | Date form code became valid. If form code has not changed this field is not populated. |
| CDPREV |  | 0..1 | Previous form code |

# APPENDIX 3 – dm+d to GTIN ConceptMap fields

When querying the ConceptMap, a search can be by the dm+d identifier or the GTIN code. The most common use case is likely to be the GTIN code after a barcode has been scanned. When querying by a code (AMPP or GTIN) this code is not returned in the response because it is known and being supplied in the query.

## Querying AMPP identifier

URL to query an AMPP identifier

**{{endPoint}}**/ConceptMap/$translate?url=https://dmd.nhs.uk/conceptmap/gtin&system=https://dmd.nhs.uk&code**={{AMPP Id}}**

Summary or URL parameters:

* **{{endpoint}}**: is the endpoint for the Terminology Server, the UK instance is: <https://ontology.nhs.uk/production1/fhir>
* /ConceptMap/$translate**:** tells the server the request is to search the code mappings
* url=https://dmd.nhs.uk/conceptmap/gtin: defines the specific concept map the data is being retrieved from. If no concept map version is given the data will be retrieved from the latest version on the Terminology Server.
* system=https://dmd.nhs.uk: specifies the code system (terminology) of the code, in this example the code is for the dm+d code system.
* code**={{AMPP Id}}**: specifies the code being searched for, in this instance it is a dm+d AMPP identifier.

## Querying GTIN code

Because the mapping is released as part of the dm+d XML files the codes are mapped from dm+d AMPP identifiers to GTIN codes. When querying a GTIN code a flag is required to show the server the mapping is being performed in the reverse direction.

**{{endPoint}}**/ConceptMap/$translate?url=https://dmd.nhs.uk/conceptmap/gtin&system=https://www.gs1.org/gtin&code=**{{GTIN code}}**&reverse=true

Summary or URL parameters:

* **{{endpoint}}**: is the endpoint for the Terminology Server, the UK instance is: <https://ontology.nhs.uk/production1/fhir>
* /ConceptMap/$translate**:** tells the server the request is to search the code mappings
* url=https://dmd.nhs.uk/conceptmap/gtin: defines the specific concept map the data is being retrieved from. If no concept map version is given the data will be retrieved from the latest version on the Terminology Server.
* system=https://www.gs1.org/gtin: specifies the code system (terminology) of the code, in this example the code is for the GS1 GTIN code system.
* code=**{{GTIN code}}**: specifies the code being searched for, in this instance it is a GS1 GTIN code.
* reverse=true: lets the concept map query know that the mapping is being searched in the reverse direction, that is search by a GTIN code and returning dm+d AMPP identifiers.

The parameter fields returned are:

|  |  |
| --- | --- |
| **Parameter Name** | **Description** |
| result | Returns “true” if matches have been found and “false” if no matches found |
| match | One or more match parameter fields will be returned if the result is “true”. Each match parameter returned relates to the relevant mapping (GTIN code or AMPP identifier), and its additional fields. |
| message | A message field will be returned if the result is “false” giving further details, usually “No mappings could be found for …”. |

The “match” parameter is made up of the following parts:

|  |  |
| --- | --- |
| **Part Name** | **Description** |
| equivalence | All the dm+d / GTIN mappings are defined with an equivalence of “relatedto”. |
| concept | This returns the mapped concept as a FHIR coding object, that is the system identifier (terminology) of the code and the code itself. |
| source | The source of the mapping, this is the URL identifying the concept map and should be the same as the url parameter specified in the URL query to the terminology server. |
| product | Multiple product fields will be returned, these in turn have multiple parts to identify the additional information of “mapping\_status”, “start” (start date) and “end” (end date). |

# APPENDIX 4 – dm+d 5 box data model

Diagram

Description automatically generated

# APPENDIX 5 – dm+d Historic Code Concept Map fields

Only dm+d codes that are susceptible to change (VTM, VMP, Ingredients, Form, Route, Supplier and Units of Measure) are in the Historic data. The other codes (AMP, VMPP, AMPP, etc.) are not included as their codes will never change.

The dm+d Historic Code concept map can be queried either forward or reverse.

* FORWARD: This is where an unknown code is being searched to see identify what the current code is. The unknown code might be a previous or a current code.
* REVERSE: This is where a known current code is being searched to identify what all the current and previous codes are.

Out of scope: when querying any of the following no data will be returned.

* SNOMED codes that have never been used in dm+d.
* SNOMED codes used as AMP, VMPP, AMPP.
* Non-SNOMED codes.

## Forward Search – Unknown Code to Identify Current Code

URL to query an unknown code (maybe a current or previous code) to identify the current dm+d code.

**{{endPoint}}**/ConceptMap/$translate?url=https://dmd.nhs.uk/conceptmap/history&system=https://dmd.nhs.uk&code**={{Unknown Code}}**

Summary or URL parameters:

* **{{endpoint}}**: is the endpoint for the Terminology Server, the UK instance is: <https://ontology.nhs.uk/production1/fhir>
* /ConceptMap/$translate**:** tells the server the request is to search the code mappings
* url=https://dmd.nhs.uk/conceptmap/history: defines the specific concept map the data is being retrieved from. If no concept map version is given the data will be retrieved from the latest version on the Terminology Server.
* system=https://dmd.nhs.uk: specifies the code system (terminology) of the code, in this example the code is for the dm+d code system.
* code**={{Unknown Code}}:** specifies the code being searched, the unknown code might be a current or previous code.

## Reverse Search – Current Code to Identify All Current and Previous Codes

URL to query a current code to return all current and previous codes.

**{{endPoint}}**/ConceptMap/$translate?url=https://dmd.nhs.uk/conceptmap/history&system=https://dmd.nhs.uk&code**={{CurrentCode}}**&reverse=true

Summary or URL parameters:

* **{{endpoint}}**: is the endpoint for the Terminology Server, the UK instance is: <https://ontology.nhs.uk/production1/fhir>
* /ConceptMap/$translate**:** tells the server the request is to search the code mappings
* url=https://dmd.nhs.uk/conceptmap/history: defines the specific concept map the data is being retrieved from. If no concept map version is given the data will be retrieved from the latest version on the Terminology Server.
* system=https://dmd.nhs.uk: specifies the code system (terminology) of the code, in this example the code is for the dm+d code system.
* code**={{CurrentCode}}:** specifies the code being searched and must be a current code.
* reverse=true: lets the concept map query know that the mapping is being searched in the reverse direction, that is search by a current code and returning all current and previous codes for the current code.

## Returned Data

The data is returned as a FHIR Parameters resource.

The parameter fields returned are:

|  |  |
| --- | --- |
| **Parameter Name** | **Description** |
| result | Returns “true” if matches have been found and “false” if no matches found |
| match | One or more match parameter fields will be returned if the result is “true”. Each match parameter returned relates to the relevant mapping, and its additional fields. |
| message | A message field will be returned if the result is “false” giving further details, usually “No mappings could be found for …”. |

The “match” parameter is made up of the following parts:

|  |  |
| --- | --- |
| **Part Name** | **Description** |
| equivalence | All the dm+d / GTIN mappings are defined with an equivalence of “relatedto”. |
| concept | This returns the mapped concept as a FHIR coding object, that is the system identifier (terminology) of the code and the code itself. |
| source | The source of the mapping, this is the URL identifying the concept map and should be the same as the url parameter specified in the URL query to the terminology server. |
| product | Multiple product fields will be returned, these in turn have multiple parts to identify the additional information of “start” (start date) and “end” (end date). |