

electronic health record

Building the Medication Terminology Table

Ms S C CHIANG

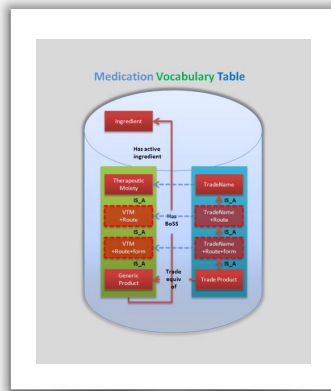
Senior Pharmacist

Hospital Authority

Seminar on "Sharing Drug Records in Electronic Health Record (eHR) System – What You Need to Know"

22 & 23 Nov 2010

Today



MTT Table Schema

A	E
HK reg	Actual Medicinal Product
51979	Ancobon (5-flucytosine) oral capsule 500 mg
41418	Acyclovir Stada (acyclovir) topical cream 5 %
47049	Zovirax Cold Sore Cream (acyclovir) topical cream 5 %
17375	Zovirax (acyclovir) eye ointment 3 %
44713	Cusiviral (acyclovir) eye ointment 3 %
44957	Super-E (d-alpha-tocopherol) oral capsule 200 international units
45083	Ametop (amethocaine) topical gel 4 %
39546	amoxycillin (Bright Future) oral capsule 250 mg
41459	APT-Amoxycillin (amoxycillin (as trihydrate)) oral capsule 250 mg
59660	Blackmores Vit D3 (cholecalciferol) oral capsule 1000 international units
55341	Novorapid (insulin aspart human) subcutaneous injection, cartridge
05569	Trental (oxpentifylline) oral controlled-release tablet 400 mg
33470	Predfoam (prednisolone (as sodium metasulphobenzoate)) rectal foam
52336	Infloran (lactobacillus acidophilus + bifidobacterium bifidum) capsules
52336	Infloran (lactobacillus acidophilus + bifidobacterium bifidum) capsules
47789	Nicotinell (nicotine) buccal chewing gum (nicotrolle) 2 mg (fruit)

Data content

eHR ISO HKMVT Editorial Rules

Appendix – Route

The HKMVT routes will be referencing, and with their definitions standard terminologies:

- UK NHS dm+d “Virtual Medicinal Product Route (List D) – tl Directorate for the Quality of Medicines & Healthcare (EDC)
- Australian TGA Approved Terminology for Medicines – Chai

Editorial rules

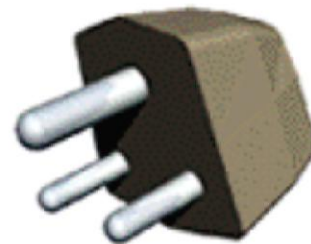
Why do we need a
Medication Terminology Table ?



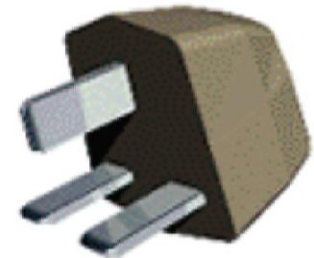
Type A



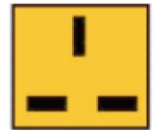
Type B



Type B3



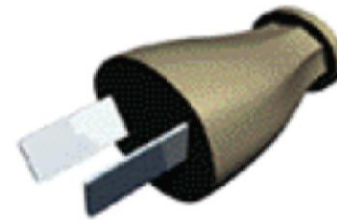
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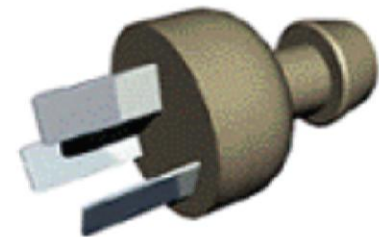
Type C



Type SE



Type O
(without ground
prong)



Type O
(with ground
prong)



Different terms for the same concept



Different terms for the same concept

Why standard drug terminology?

“There is a **lack of standardisation** in the UK in describing medicines, appliances and medical devices, in how such descriptions are organised, and in linking knowledge required for decision support to these descriptions...”

NHS Connecting for Health

Terminologies and classifications form the **foundations of information content in the electronic health record (eHR)**...

*American Medical Informatics Association
American Health Information Management Association Terminology and
Classification Policy Task Force*

“providing the foundation for EHR... making the healthcare knowledge more usable and accessible on national and international level... **ensuring systems interoperability**... improving patient safety...”

*R Rudowski et al.
International Society of Telemedicine & eHealth*

“...(terminology standard) is part of the EHR solution... and not the total solution

*American Medical Informatics Association
American Health Information Management Association Terminology and
Classification Policy Task Force*

What do we want to achieve?

Standard Drug Terminologies

1	Standardisation of drug terminologies	
2	Inter-operability	
3	Support electronic health record	
4	Pave way for future decision-support	
5	Improved quality of care and patient safety	

Which standard drug terminology shall we use ?



SNOMED-CT core, ICD-10 etc



SNOMED-CT core, ICD-10 etc



SNOMED-CT core, ICD-10 etc

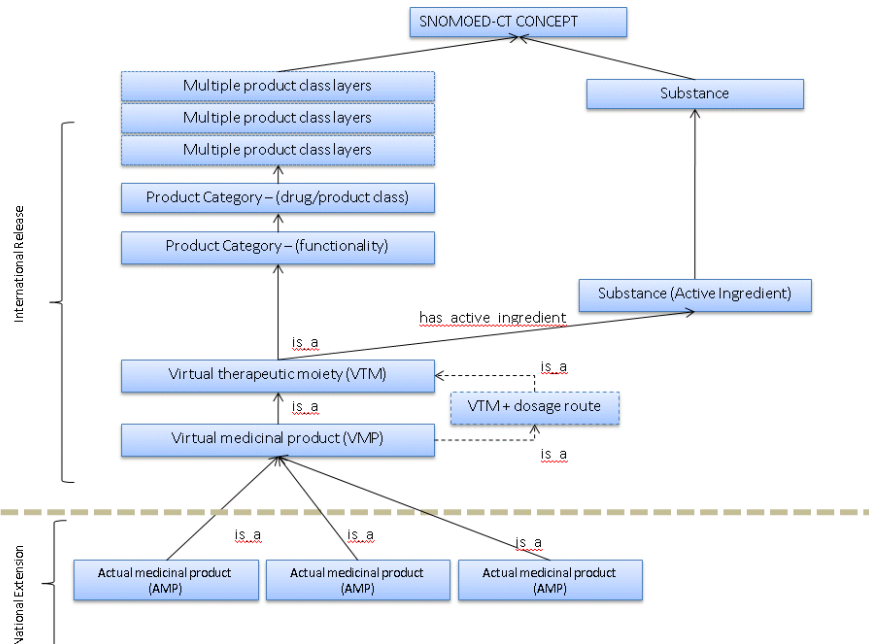


RxNorm, SNOMED-CT, FDA, FDB, Micromedex, etc

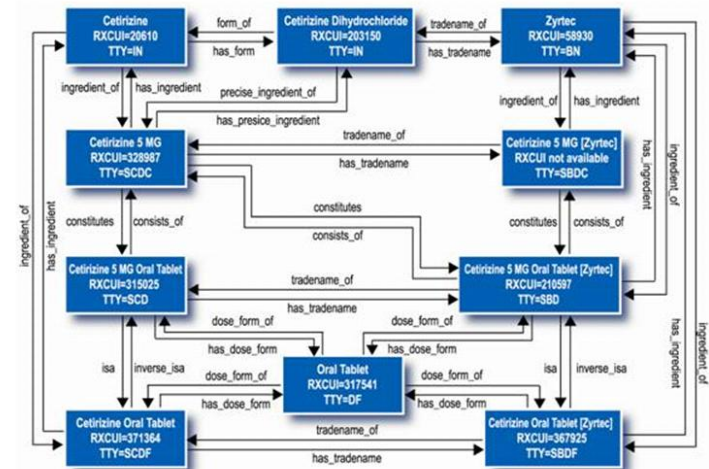
Which Standard Drug Terminology?

Both have similar hierachial structure for concepts relevant to clinical systems

SNOMED CT



RxNorm



Members states include:

Australia, Canada, Cyprus, Denmark, Lithuania, New Zealand, Singapore, Spain, Sweden, The Netherlands, United Kingdom, United States.

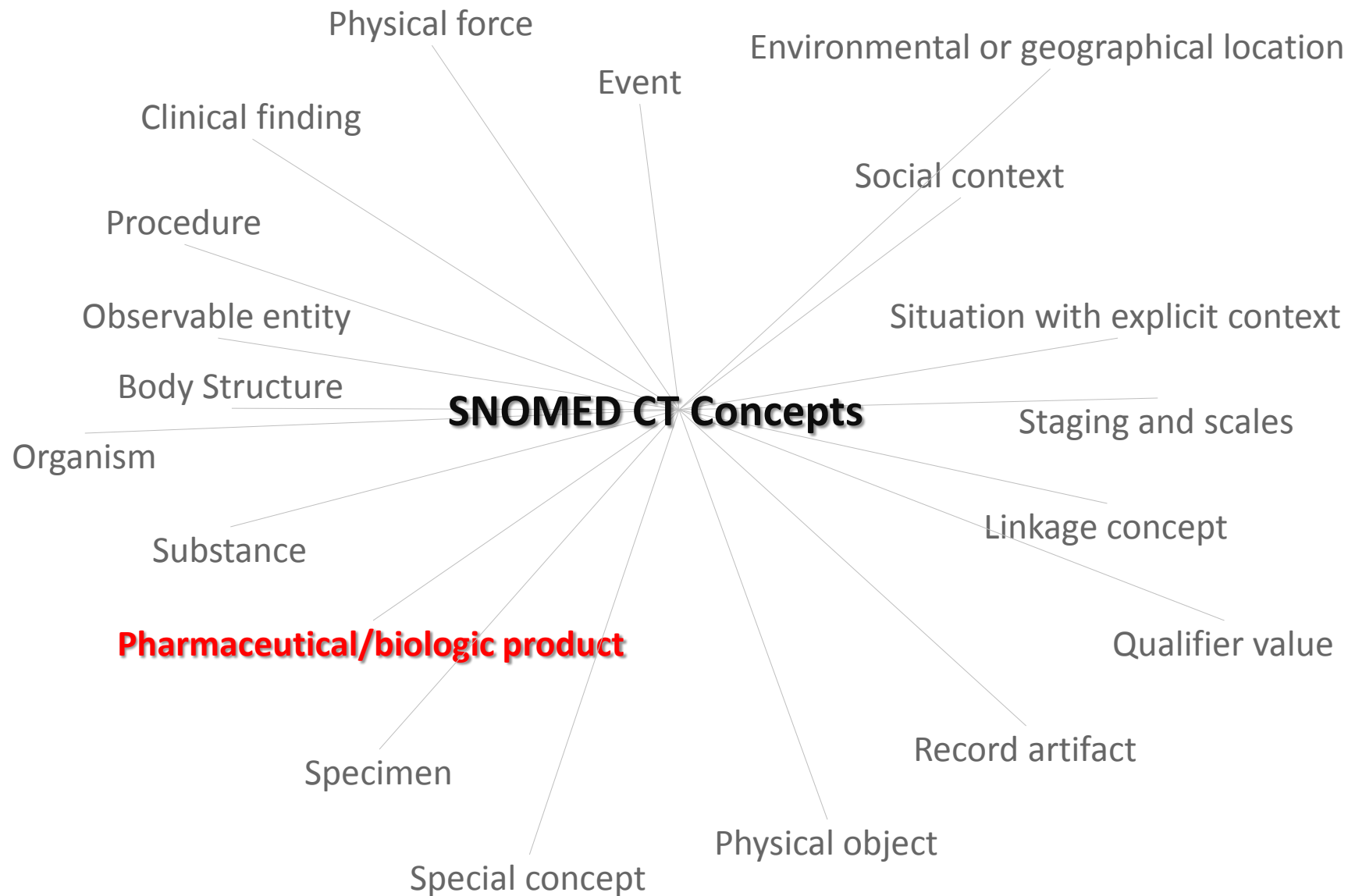
Developed and maintained by:

IHTSDO (formerly SNOMED RT and UK CTV)

United States

Developed and maintained by:

National Library for Medicine (NLM)



SNOMED CT: the basics

CONCEPTS

- A concept is a clinical meaning, identified by a unique identifier (ConceptID)
- Every concept has a description (fully specified name) as well as many synonymous descriptions (ie the preferred names)

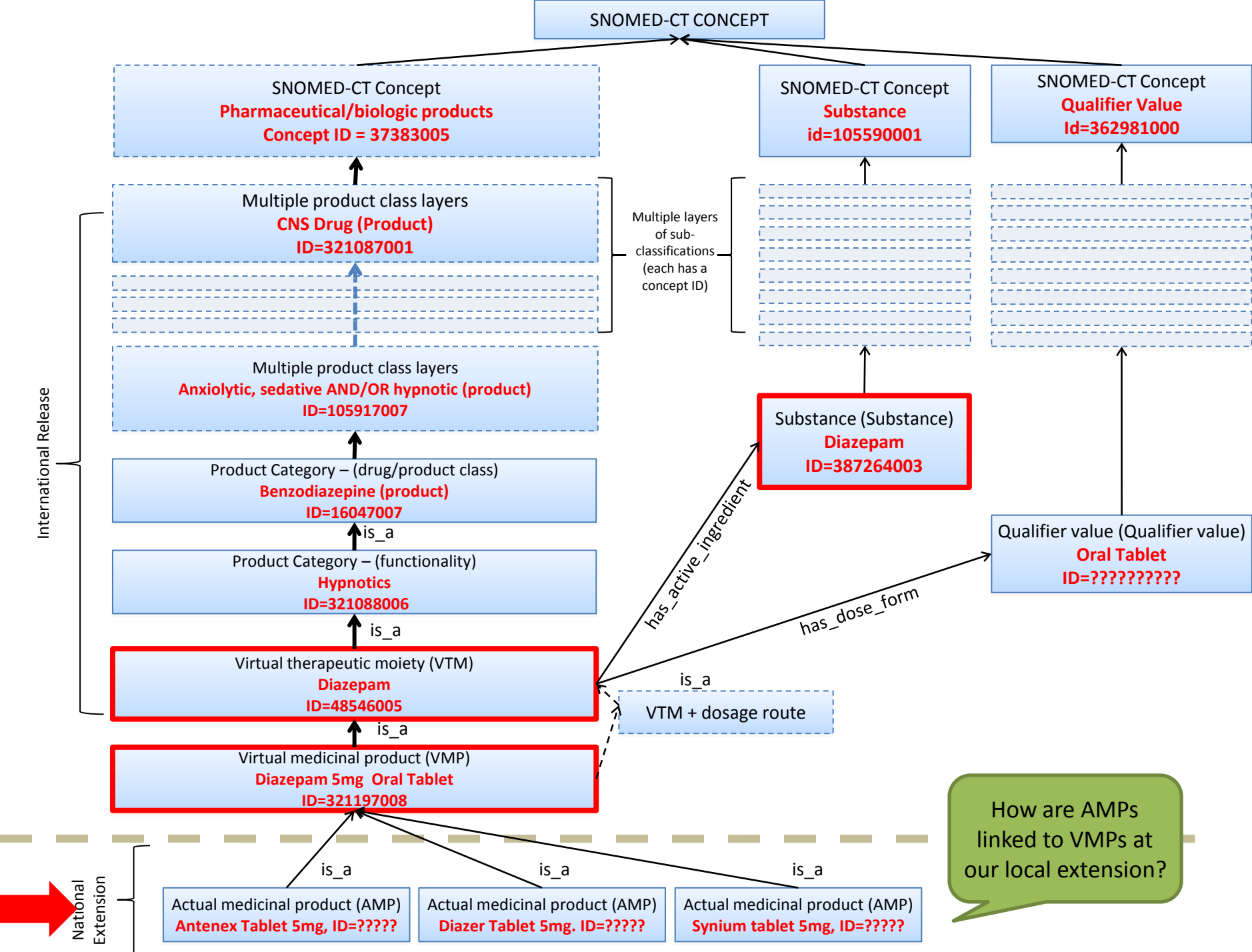
HIERACHY

- SNOMED-CT is comprised of 19 top hierachies
- Each has a whole series of inter-related concepts
- Concept in SNOMED CT is placed in a hierachy and has tree-like relationships (“IS_A”)

RELATIONSHIPS

- e.g. “Diazepam 5mg Tablet” IS_A “Diazepam” IS_A “Benzodiazepine” IS_A “Hypnotic” IS_A “.....etc
- Intra- and inter-relationships exist between concepts, at various levels

For more information: *“SNOMED CT - the language of the NHS Care Records Service (A guide for NHS staff in England)”*

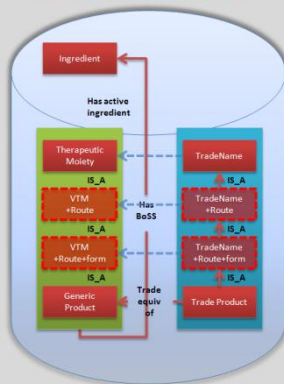


**How to kick start the process
of building the HK MTT?**

Kick start process for the Local Hong Kong Scene

- At the Hong Kong Government
 - Drug Compendium maintained by the DoH
 - Contains all pharmaceutical products in HK (about 20,000 – 30,000 drug items)
 - Each pharmaceutical product has a Hong Kong Product Registration number
- At Hospital Authority Hong Kong
 - Maintains a Centralised 'HA' drug database
 - Contains all drugs used in HA (about 6,000)

Medication Vocabulary Table



How's : the MTT Table Schema

Building the Medication Terminology Table

Ingredient

Route

Form

Therap
Class

EDIT

TAGGING

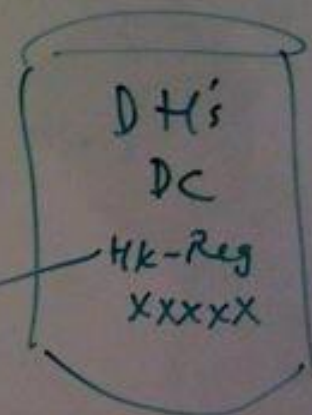
NEW

Copy (non-
destructive)
+ New Attribute
(= Top down)

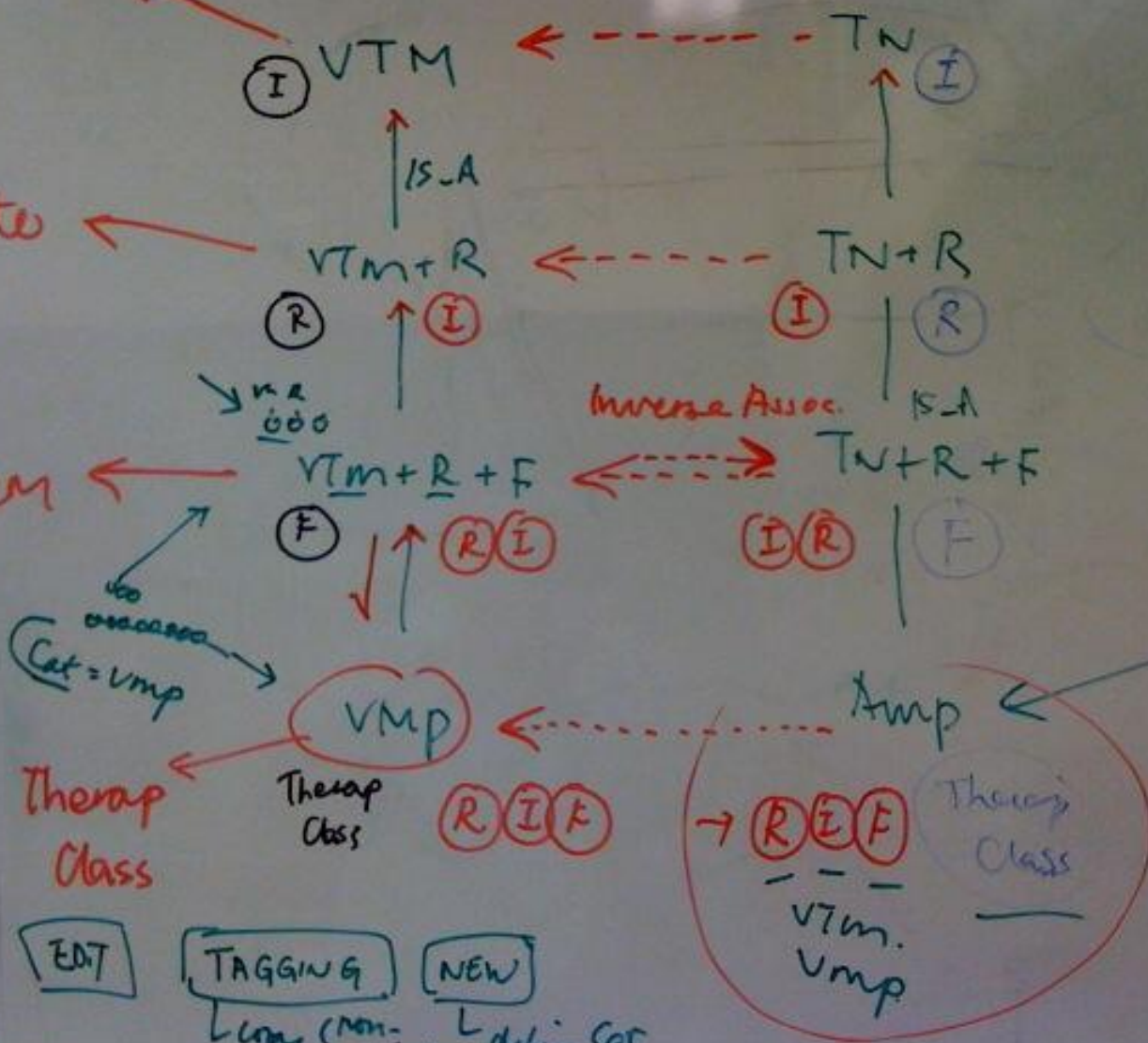
define Cat.
(= Bottom up)

(I) Direct
Inherited
from Parents

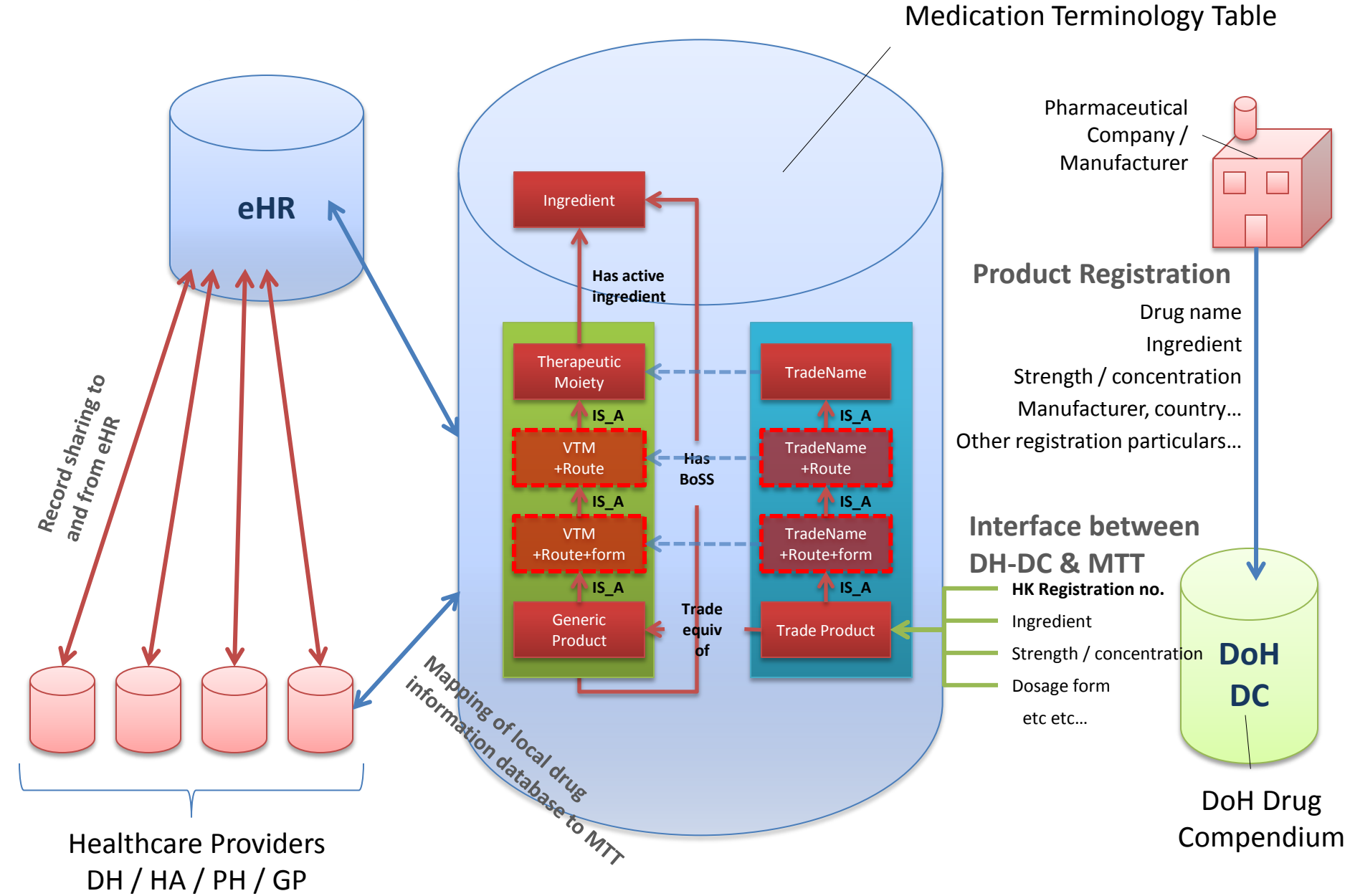
Selective
Inheritance



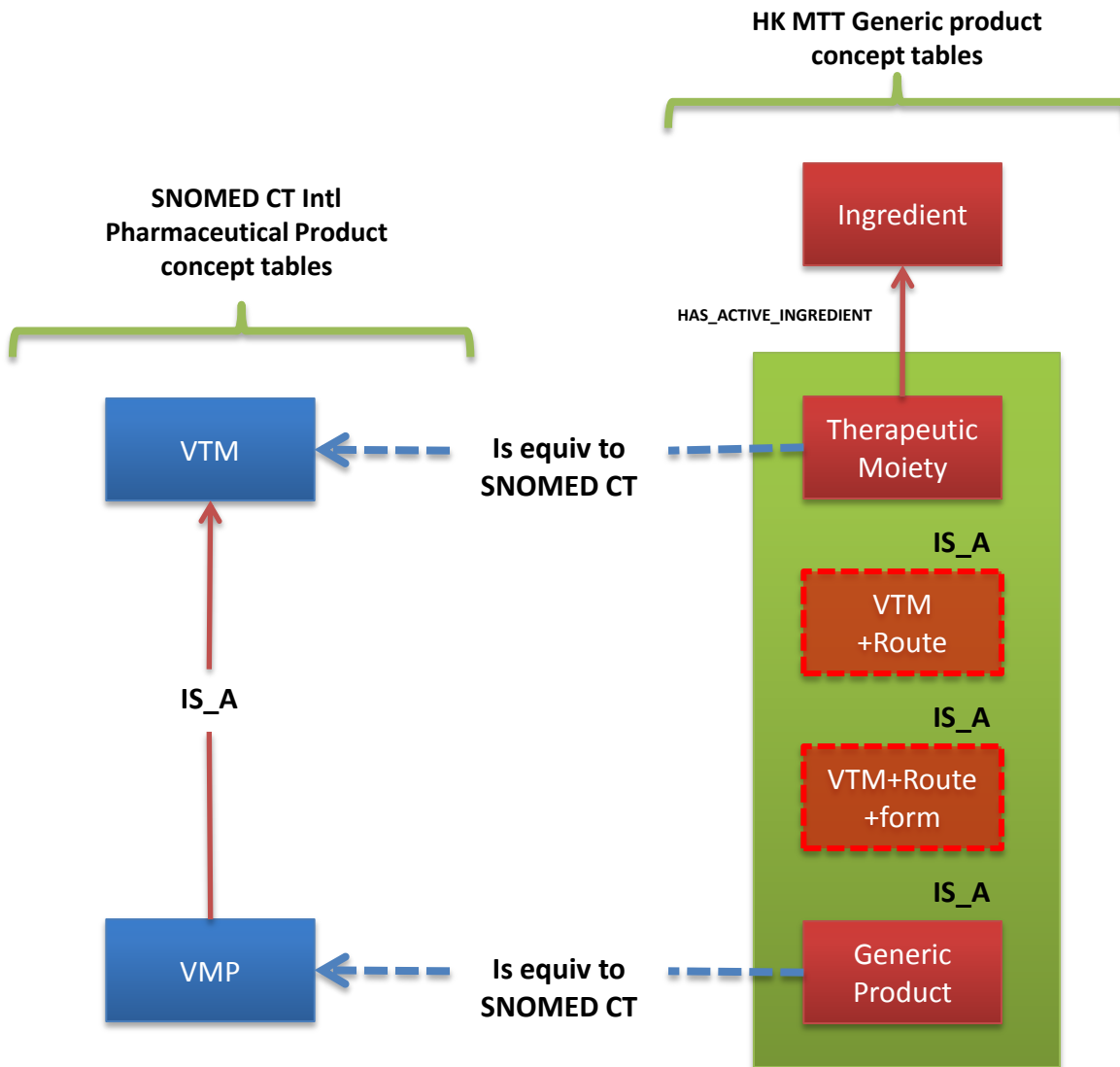
室的新
是向 12
借的，請
自己的
更換。



Local Interoperability



Participating organisations will need to map to the MTT tables according to their drug data table structure. This mapping allows communication with eHR.



International Interoperability:

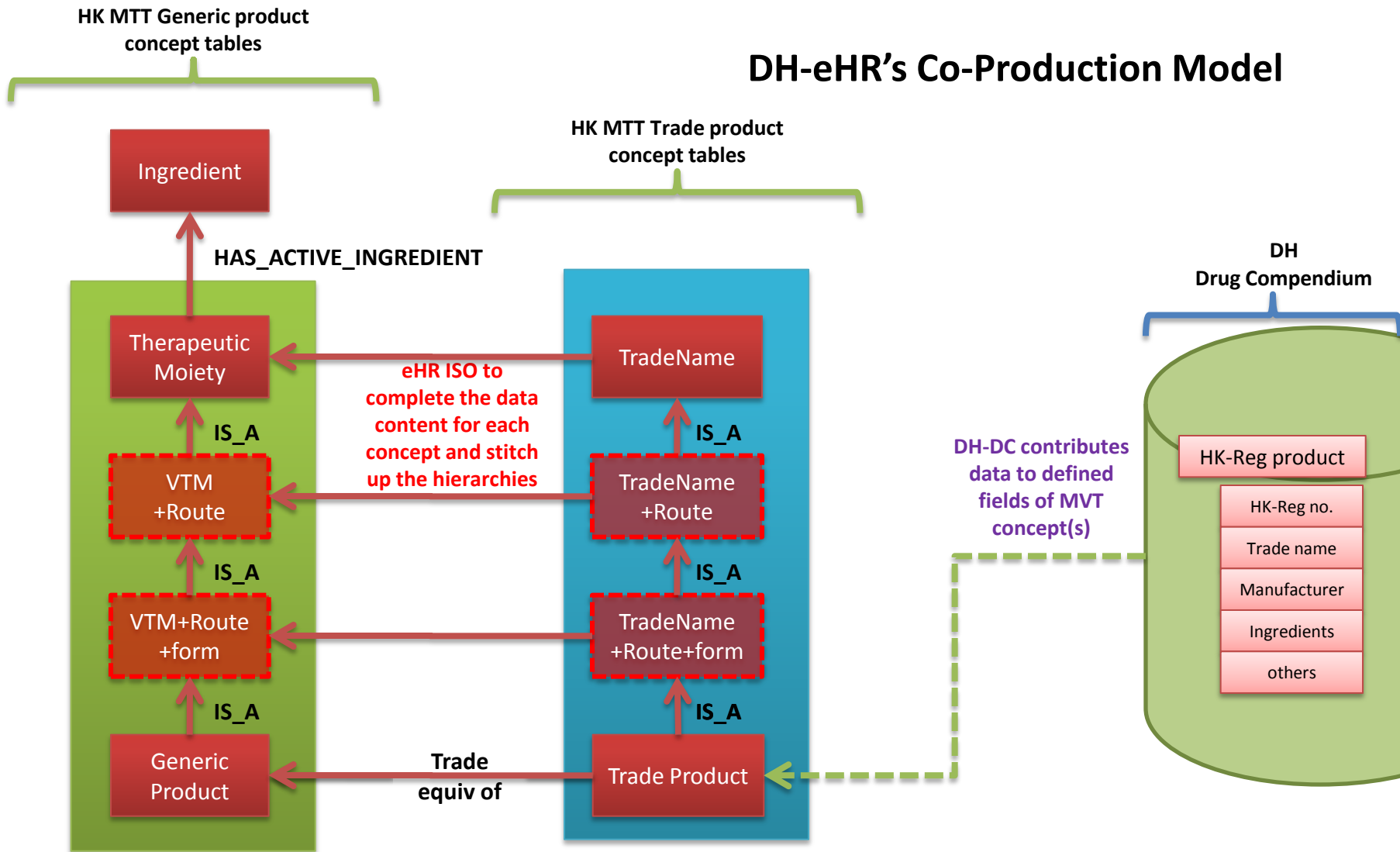
A mechanism (e.g. “IS_equiv_to_SCT”) by which the relationships with targeted generic concept tables and SNOMED can be defined.

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HK reg	Actual Medicinal Product
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47049	Zovirax Cold Sore Cream (acyclovir) topical cream 5 %
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How's : the data content

Building the Medication Terminology Table

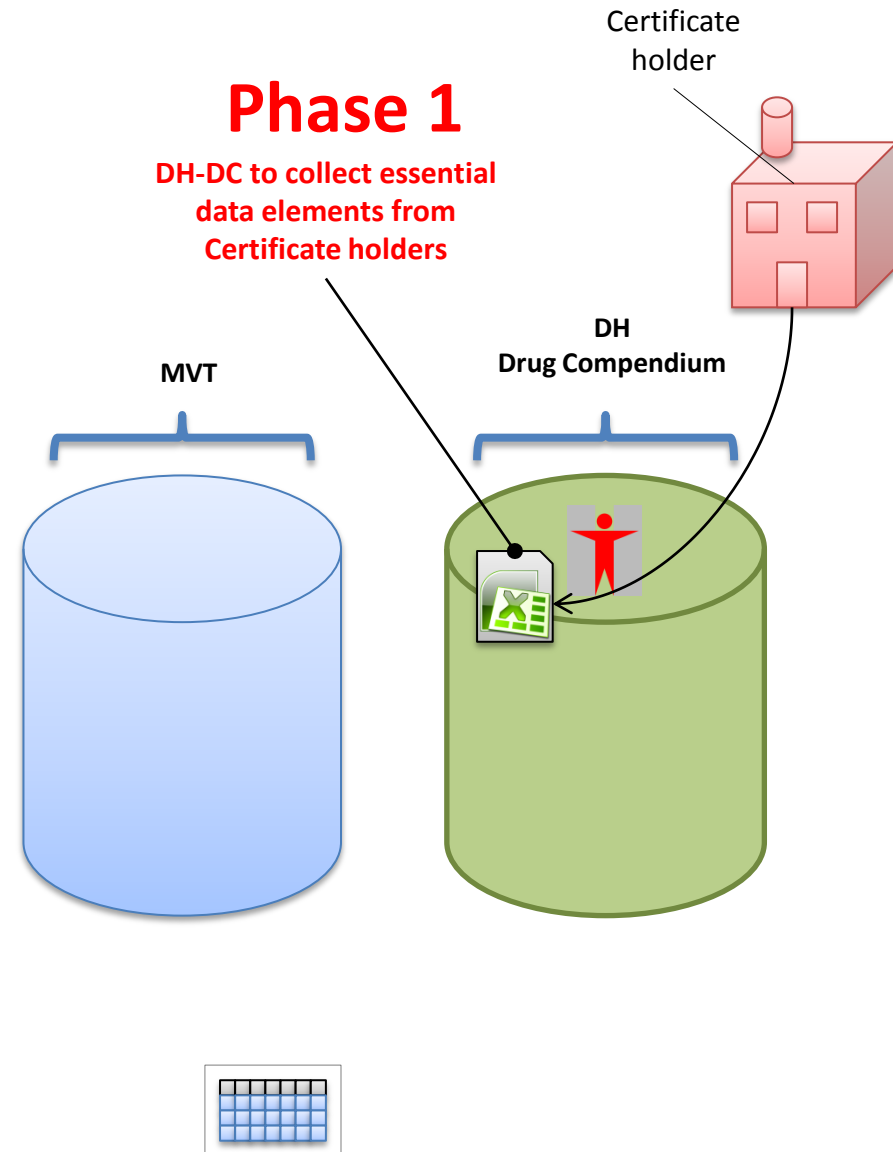
DH-eHR's Co-Production Model



The concept tables should support the co-production mechanism from DH's Drug Compendium

1

Define manual
co-production
data set

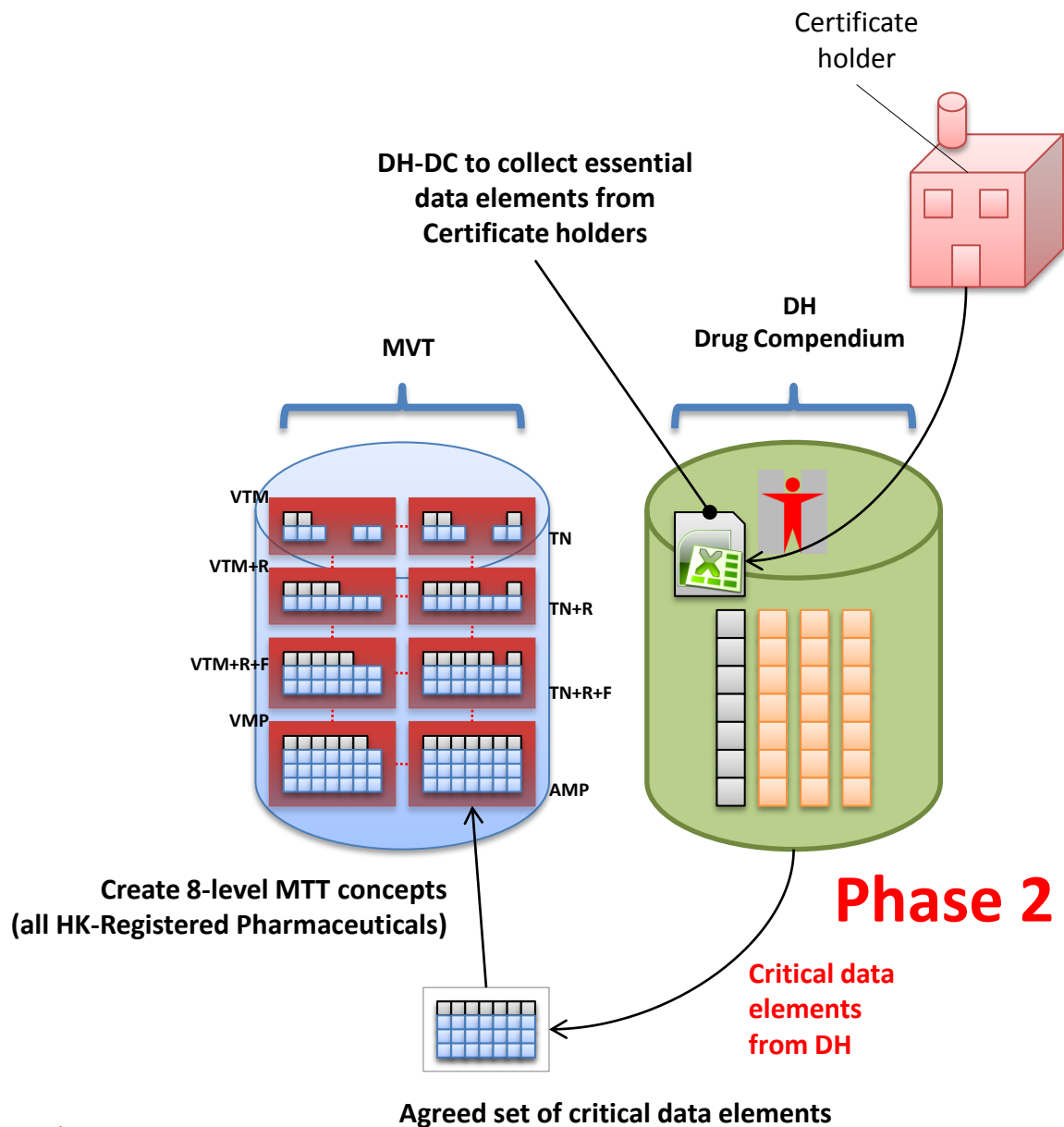


Agreed set of critical data elements

Extracted from "Update on HK Drug standards – 7th DH-HA Liaison Meeting

Phase 1 of MTT data preparation – we will be importing the entire Drug Compendium "Product Name" as its current state into AMP (no structural element yet); DH will start inviting certificate holders to review their trade names; also that DH-HA will work out an agreed set of critical data elements.

1	Define manual co-production data set
2	Import to MTT

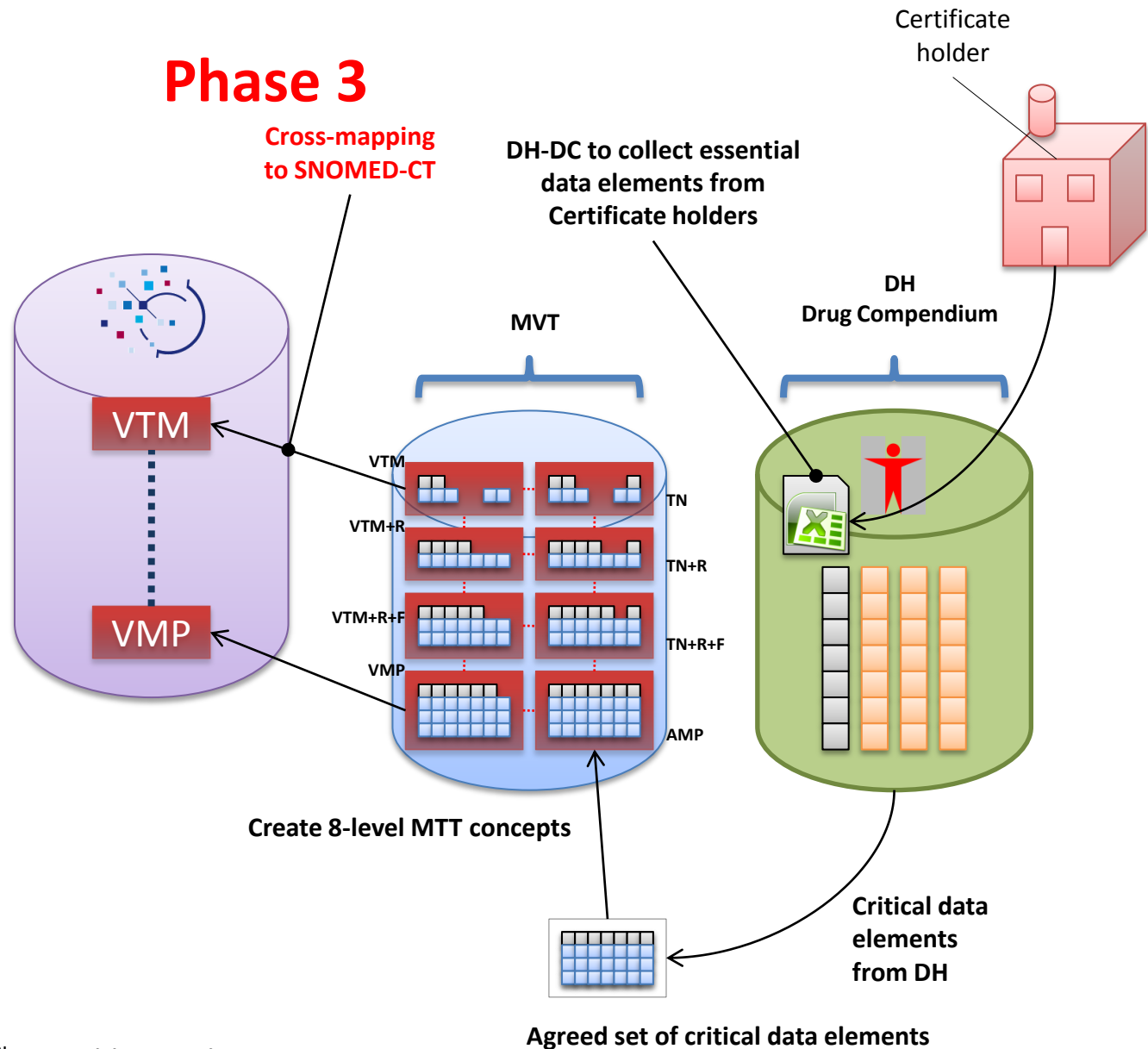


Extracted from "Update on HK Drug standards – 7th DH-HA Liaison Meeting

Phase 1 of MVT data preparation – we will be importing the entire Drug Compendium "Product Name" as its current state into AMP (no structural element yet); DH will start inviting certificate holders to review their trade names; also that DH-HA will work out an agreed set of critical data elements.

1	Define manual co-production data set
2	Import to MTT
3	SNOMED-CT

Phase 3

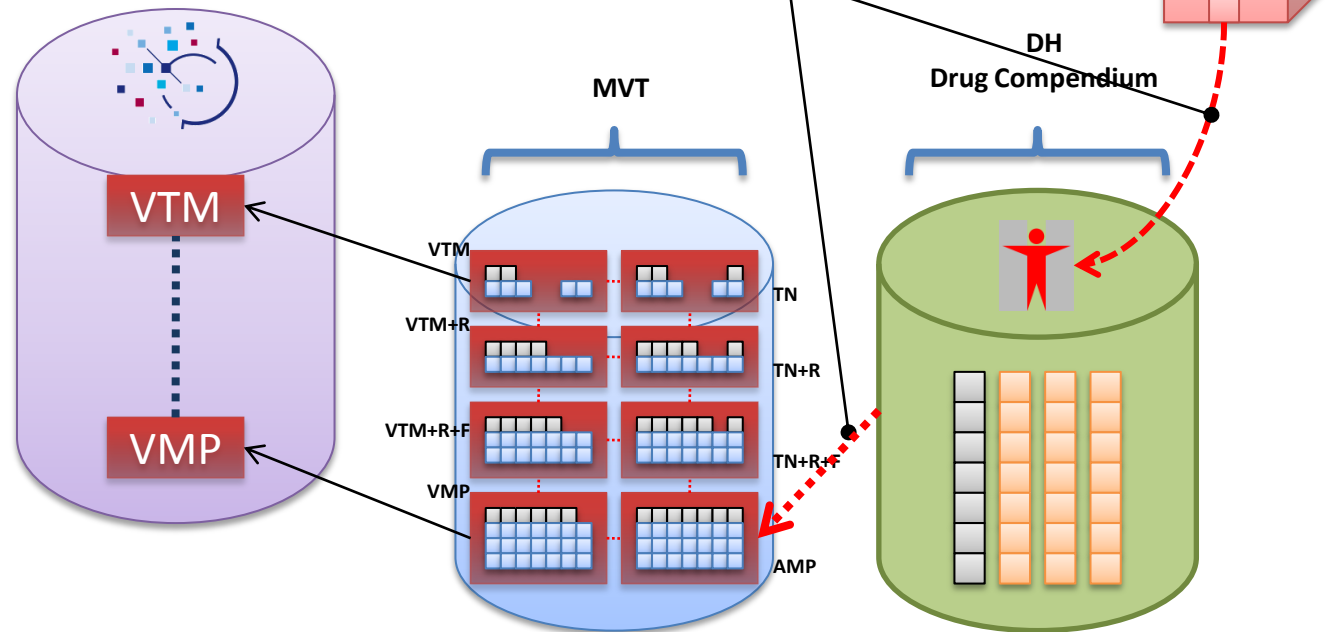


Extracted from “Update on HK Drug standards – 7th DH-HA Liaison Meeting

Phase 1 of MTT data preparation – we will be importing the entire Drug Compendium “Product Name” as its current state into AMP (no structural element yet); DH will start inviting certificate holders to review their trade names; also that DH-HA has worked out an agreed set of critical data elements.

Phase 4 (Year 2013 onwards)

1	Define manual co-production data set
2	Import to MTT
3	SNOMED-CT
4	Full-blown co-production



DH Drug Compendium data structure and content will be ready by 2013 – all future MTT concept should be initiated by a newly registered product on the Drug Compendium.

Appendix – Route

The HKMTT routes will be referencing, and with their definitions standard terminologies:

- UK NHS dm+d “Virtual Medicinal Product Route (List D) – the Directorate for the Quality of Medicines & Healthcare (EDC)
- Australian TGA Approved Terminology for Medicines – Chapter

How's : editorial rules

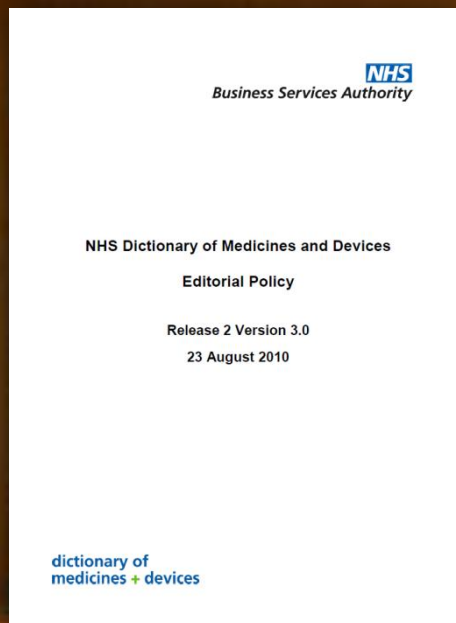
Building the Medication Terminology Table

Basic principles

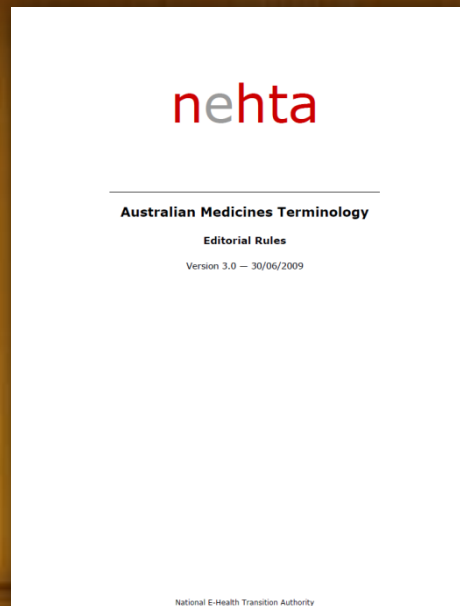
- Compliant with standard
- Descriptive enough to allow identification and classification
- **Unambiguous**
- Concise
- **Clinically relevant**

Editorial rules - aims

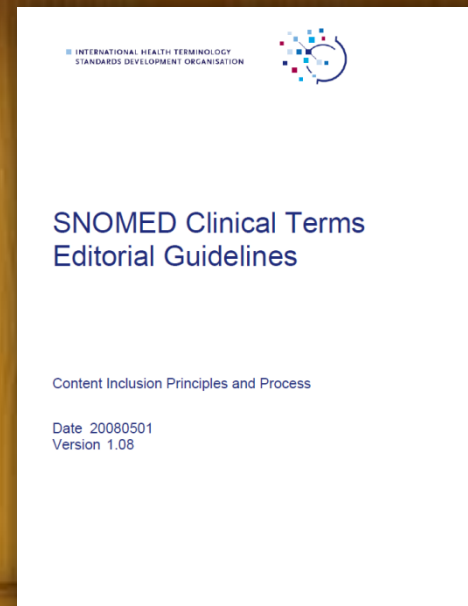
- **Consistent** identification of branded and generically equivalent medicines
- **Consistent** naming conventions / term expressions
- Provide clinically relevant drug product information for **eHR record sharing**, **prescribing** and **drug checking** systems
- Sufficient information to support **linkage with SNOMED-CT**



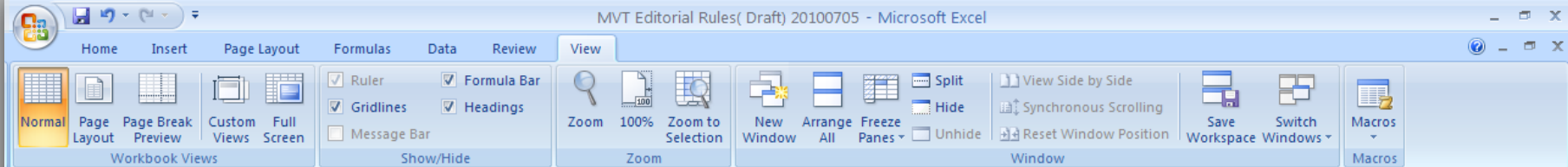
**NHS Dictionary of
Medicines and
Devices (dm+d)
Editorial Policy
August 2010**



**nehta Australian
Medicines
Terminology (AMT)
Editorial Rules
June 2009**



**SNOMED CT
Editorial
Guidelines
May 2008**



The Virtual Medicinal Product Preferred Term will be derived from the actual active ingredients.								
	E	F	G	H	I	J	K	L
1	RuleID	Concept	Attribute	Section title on Draft	Constraints / Data Definition			
6	MVT-VTM-PT-1	VTM	Preferred Term	Virtual Therapeutic Moiety "Preferred Terms" Rules	All rules in "Preferred Term definition and Rules)" apply Capitalisation rules as defined in apply.			
7	MVT-VTM-PT-2	VTM	Preferred Term	Virtual Therapeutic Moiety "Preferred Terms" Rules	The Virtual Medicinal Product Preferred Term will be derived from the International Non-proprietary Names (INN), followed by other approved or clinically intuitive names.	AMT-MP-PT-2	Draft	For discussion on Ingredient Naming Conventions (Ref AMT Appendix III)
8	MVT-VTM-PT-3	VTM	Preferred Term	Virtual Therapeutic Moiety "Preferred Terms" Rules	The Virtual Medicinal Product Preferred Term will be derived from the actual active ingredients. The full name of an ingredient (including the salt) will be used in all case	AMT-MP-PT-3	Draft	
9								For discussion on naming convention of multi-ingredient
10	MVT-VTM-PT-5	VTM	Preferred Term	Virtual Therapeutic Moiety "Preferred Terms" Rules	The identification of all active ingredients is available from the Virtual Medicinal Product (VTM) "has_active_ingredient" relationship with Ingredient (substance).	AMT-MP-PT-4	Draft	AMT define vaccine and large volume parenteral products as exception that these products would use more than 3 active ingredients in the creation of names
11	MVT-VTM-PT-6	VTM	Preferred Term	Virtual Therapeutic Moiety "Preferred Terms" Rules	The sequence by which the active ingredients are displayed in the Virtual Medicinal Product Preferred Term will be based on the alphabetical order of the active ingredient's preferred term as in the "ingredient (substance) hierarchy". This order sequence will be alphabetical, with the exception of those specified in the appendix of the Editorial Rule. Exceptions would be reviewed on a case-by-case basis.			sequence on FSN and PT should defer (by our current design, the FSN and PT are made up of the same sequence)
12	MVT-VTM-AN-1	VTM	Aliasname	Virtual Therapeutic Moiety "Aliasname" Rules	All rules in "Aliasname definition and Rules)" apply Capitalisation rules as defined in Appendix apply.	N/A	Draft	no such attribute in AMT / SNOMED / DM+D
13	MVT-VTM-AN-2	VTM	Aliasname	Virtual Therapeutic Moiety "Aliasname" Rules	The entry of Aliasnames would be optional and only be populated when it is clinically relevant; it should be constructed in the way that it does not impact the product being safely identified.	N/A	Draft	no such attribute in AMT / SNOMED / DM+D
14								

Reference rule (AMT/dm+d)

Each rule documented is organised and categorised in a similar way as our reference terminology standard

Editorial rules are documented expressively

Current status of the rules

Document rules that we do not follow or differ from our reference standard

Reference rule (AMT/dm+d)

Each rule documented is organised and categorised in a similar way as our reference terminology standard

Editorial rules are documented expressively

Current status of the rules

Document rules that we do not follow or differ from our reference standard

VTM Rule 1: capitalisation rules

“The first character of a description should be in lower case or an integer, applicable to all concept types including the Fully Specified Names, Preferred Terms, Synonyms or other descriptions, unless otherwise specified...”

Reference: AMT Appendix I – Capitalisation (AMT-APP-CAP-1)

“Full proper nouns will be expressed (e.g. Bacillus Calmeete and Guerin)
Abbreviated descriptions such as "BCG" would be maintained as the aliasname in MVT, where applicable...”

Reference: AMT Appendix I – Capitalisation (AMT-APP-CAP-14)

“Single letters following a substance name will be expressed in upper case (e.g. vitamin C, amphotericin B, hepatitis B)”

Reference: AMT Appendix I – Capitalisation (AMT-APP-CAP-7)

“Scientific names used to describe an organism will be expressed in full names and upper or lower case according to convention (e.g. Haemophilus influenzae, Streptococcus aureus)”

Reference: AMT Appendix I – Capitalisation (AMT-APP-CAP-8)

~~Amoxicillin~~



“amoxicillin”

~~Influenza Virus Vaccine~~



“influenza virus vaccine”

~~BCG~~



bacillus calmette guerin

~~hepatitis b~~



hepatitis B

~~haemophilus
influenzae~~



Haemophilus
influenzae

Appendix – Route

The HKMVT routes will be referencing, and with their definitions extracted from the following standard terminologies:

- UK NHS dm+d "Virtual Medicinal Product Route (List D) – the VMP route consists of European Directorate for the Quality of Medicines & Healthcare (EDQM) Standard terms.
- Australian TGA Approved Terminology for Medicines – Chapter 2 : Australian Approved Terms for Use in the Completion of Applications for the Registration or listing of Therapeutic Goods, section 6 – Routes of Administration
- US Food and Drug Administration (FDA) Centre for Drug Evaluation and Research (CDER) Data Standard Manual (Data Element #C-DRG-00301 Route of Administration)

Table - MVT Route List

Route	Definition
buccal	Buccal pertaining to the cheek cavity
dental	Dental Pertaining to the teeth or a tooth
ear	Administered into the ear
epidural	Administered to the outside, upon, or over the dura mater
extracorporeal	Extracorporeal circulation, haemodialysis
infiltration	The diffusion or accumulation in a tissue or cells
inhalation	Taking into the lungs by breathing through the nasal or oral respiratory route for local or systemic effect
intra-arterial	Within an artery or arteries
intra-articular	Within a joint or inside the cavity of a joint
intracardial	Within the heart
intracavernosal	Within the tissues of the corpus cavernosum penis, but not including urethral administration or application to the skin
intracavitary	Within the cavity of a hollow organ, as that of the cervix
intracisternal	Within or into a cistern
intracutaneous	Within the structure of the skin
intra-dermal	Within the dermis
intradiscal	Into or within the fibrocartilage plates separating the articulating surfaces of bone
intraepidermal	Administration within the epidermis
intralesional	Introduced directly into a localised lesion
intramammary	Within the breast
intramural	Within the substance of the wall of an organ
intramuscular	Within or into the substance of a muscle

MVT Route list

MVT Route List

This list supports the representation of the place in, or on the body where a medicinal product may be introduced or applied in order that it achieves its intended therapeutic effect.

At draft stage

Subject to reviews and refinements

Ongoing update

Reference:

- UK NHS dm+d Editorial Policy (Aug 2010)
- Australia NEHTA AMT Editorial Rules (Jun 2009)
- US FDA CDER Data Standard Manual (downloaded as of September 2010)

Appendix – Dose Form

The HKMVT dose forms will be referencing, and with their definitions extracted from the following standard terminologies:

- UK NHS dm+d “Virtual Medicinal Product Form (List C)” – the VMP form consists of European Directorate for the Quality of Medicines & Healthcare (EDQM) Standard terms. dm+d has made amendments to minimize multiplicity of terms or excluded terms where the pharmaceutical forms do not reflect the prescribed form.
- Australian NEHTA AMT Appendix VII – Form (section 10.7) – originally derived from the TGA Approved Dosage Forms, with additional forms added to allow specification of subtypes.
- US Food and Drug Administration (FDA) Centre for Drug Evaluation and Research (CDER) Data Standard Manual (Data Element #C-DRG-00201 Dosage Form)

The HKMVT Dose Forms are listed in the table below. In most cases a dose form requires the combined use of a specified route to allow the true pharmaceutical form be defined. For example, a tablet dosage form can be used via the buccal or oral route but the true prescribable pharmaceutical form would be “buccal tablet” and “oral tablet” respectively. In HKMVT, a route will be assigned to the AMPs, VMPs, VTM+R+F and TN+R+F, hence there need not be a route be specified in the dosage form – MVT will assign dose forms according to the route specified.

For example, in the case of a tablet formulation that is intended to be ingested, the route will be “oral” and dose form will be “tablet”, hence the route-dose form combination will become “oral tablet” (e.g. paracetamol oral tablet 500 mg).

Table - MVT Dose Form List

Specified route	Dose form	Definition
bone dental	cement	A cement applied to parts of the body to enable adherence.
buccal	tablets	Tablet to be applied to the buccal cavity or to be sucked.
buccal	chewing gum	A preparation containing one or more active ingredients in a gum base, to be chewed and subsequently discarded.
buccal	lozenge	A solid preparation, containing one or more active ingredients, usually in a flavoured base, which is intended to dissolve or disintegrate slowly in the mouth to effect a local action.
buccal	mouthwash	An aqueous solution of one or more active ingredients intended, usually after dilution with warm water, for use in contact with the mucous membranes of the oral cavity, in some cases including gargling.

MVT Dose Form list

MVT Dose Form List

This is a list of valid qualifier value concepts to describe the dose formulation, such as capsules, tablets, injections. These dose forms are used to support the representation of the orderable physical formulations of medicinal products held in HKMVT.

Referenced and consolidated from reference standard terminologies

At draft stage

Subject to reviews and refinements

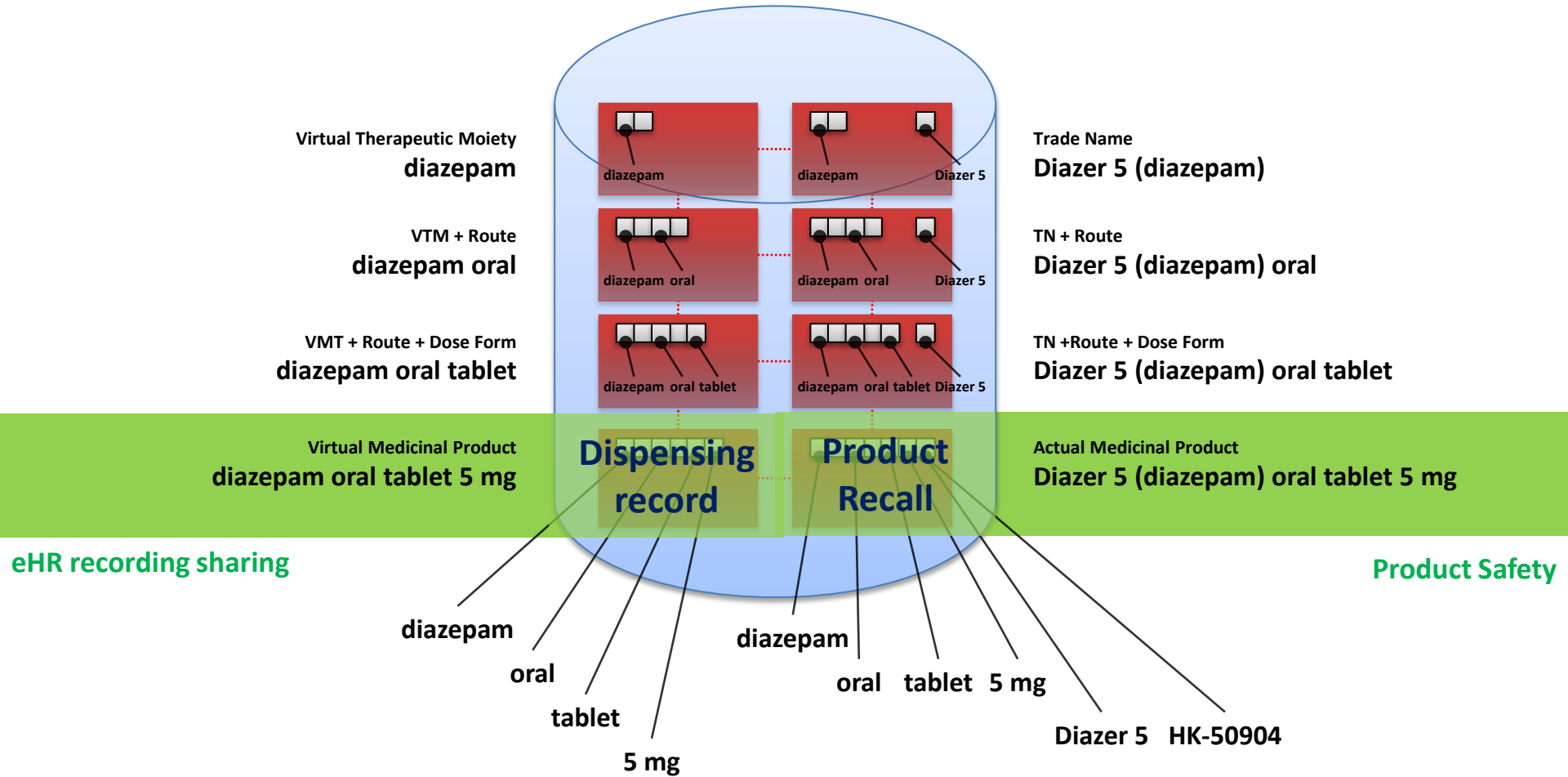
Ongoing update

Reference:

- UK NHS dm+d Editorial Policy (Aug 2010)
- Australia NEHTA AMT Editorial Rules (Jun 2009)
- US FDA CDER Data Standard Manual (downloaded as of September 2010)

Usage of MTT

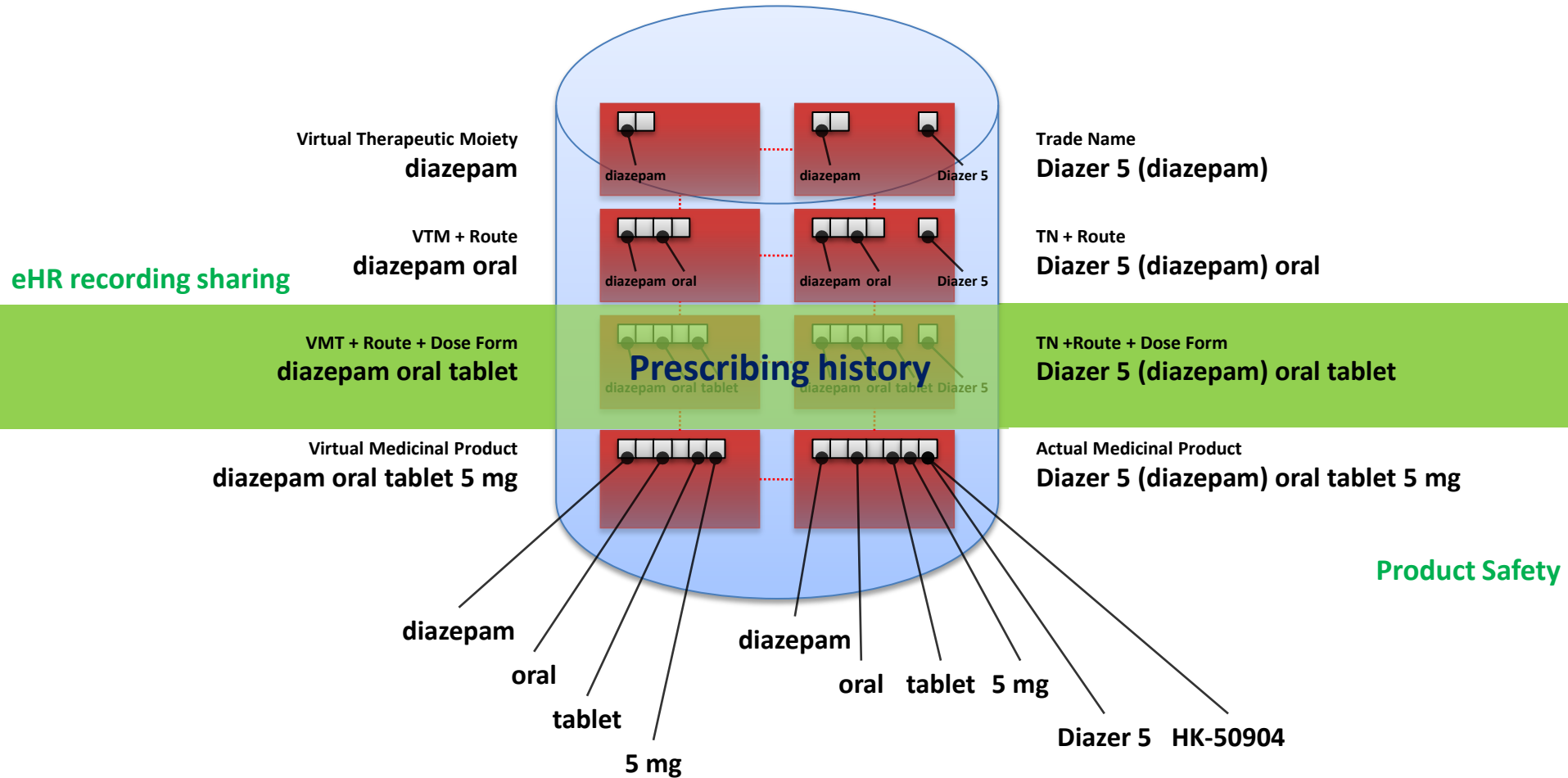
Medication Terminology Table



HK Registration no.	Trade Name	Virtual Therapeutic Moiety (preferred term)	Route	Dose Form	Strength
50904	Diazer 5	diazepam	oral	tablet	5 mg

Usage of MTT

Medication Terminology Table



HK Registration no.	Trade Name	Virtual Therapeutic Moiety (preferred term)	Route	Dose Form	Strength
50904	Diazer 5	diazepam	oral	tablet	5 mg

Usage of MTT

Medication Terminology Table

Data elements for Clinical Systems

Virtual Therapeutic Moiety
diazepam

VTM + Route
diazepam oral

VMT + Route + Dose Form
diazepam oral tablet

Virtual Medicinal Product
diazepam oral tablet 5 mg

Trade Name
Diazer 5 (diazepam)

TN + Route
Diazer 5 (diazepam) oral

TN + Route + Dose Form
Diazer 5 (diazepam) oral tablet

Actual Medicinal Product
Diazer 5 (diazepam) oral tablet 5 mg

**Provides a logical
hierarchies for prescribing
drug search and other
structural elements
(e.g. drug-based prescribing unit)**

Product Safety

diazepam

oral

tablet

5 mg

diazepam

oral tablet 5 mg

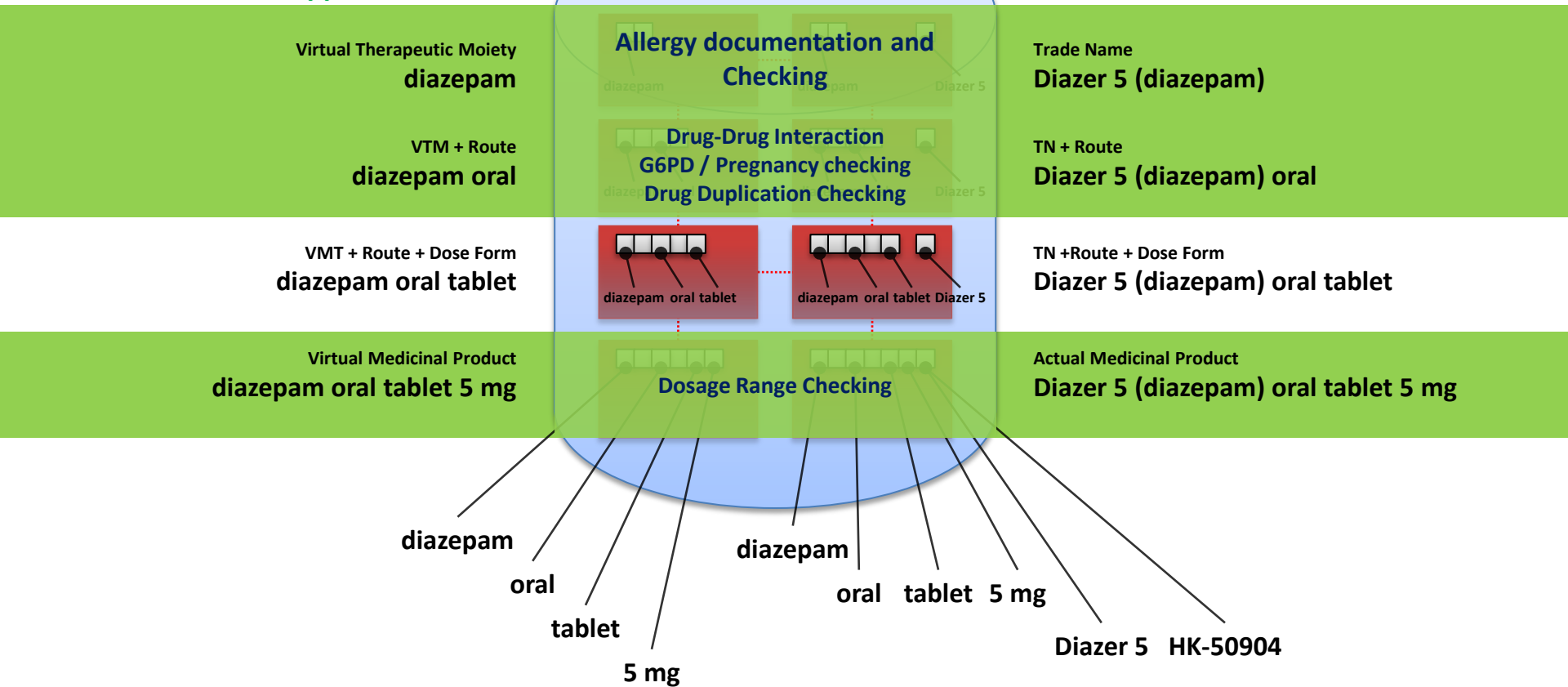
Diazer 5 HK-50904

HK Registration no.	Trade Name	Virtual Therapeutic Moiety (preferred term)	Route	Dose Form	Strength
50904	Diazer 5	diazepam	oral	tablet	5 mg

Usage of MTT

Medication Terminology Table

Medication Decision Support

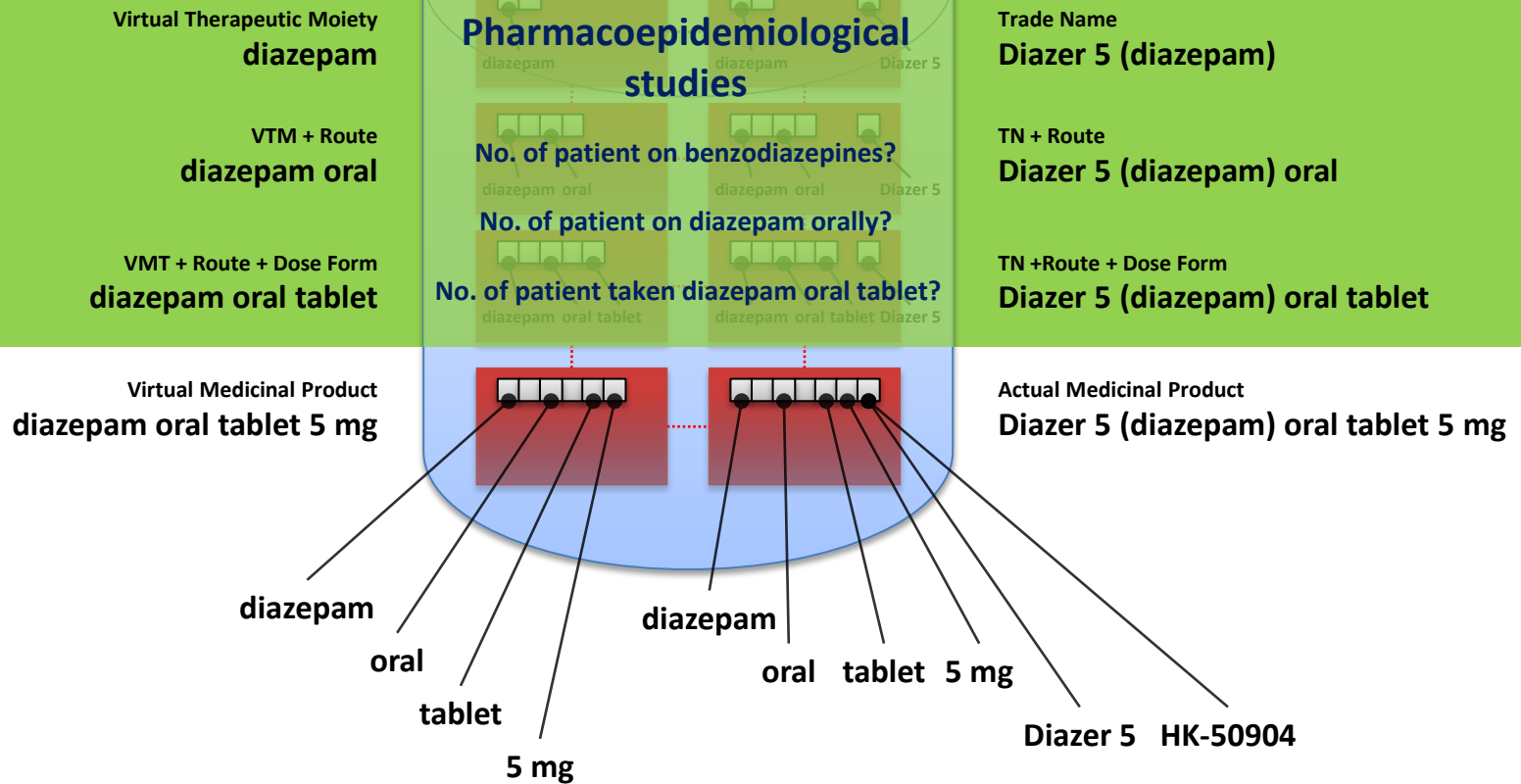


HK Registration no.	Trade Name	Virtual Therapeutic Moiety (preferred term)	Route	Dose Form	Strength
50904	Diazepam 5	diazepam	oral	tablet	5 mg

Usage of MTT

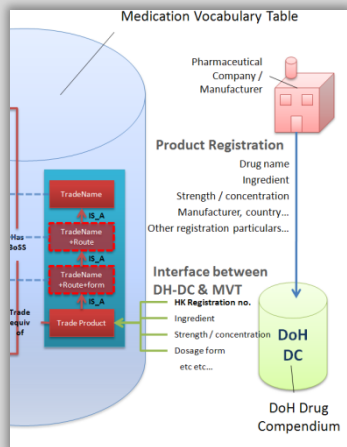
Medication Terminology Table

Pharmaco-epidemiology studies



HK Registration no.	Trade Name	Virtual Therapeutic Moiety (preferred term)	Route	Dose Form	Strength
50904	Diazer 5	diazepam	oral	tablet	5 mg

The Plan



develop Co-Production Mechanisms

A	B	C
HK reg.	Actual Medicinal Product	Registered Trade Name
51979	Amcobon (5-fluoritosine) oral capsule 500 mg	Amcobon (5-fluoritosine)
41418	Acylovir Stada (acyclovir) topical cream 5 %	Acylovir Stada (acyclovir)
47049	Zovirax Cold Sore Cream (acyclovir) topical cream 5 %	Zovirax Cold Sore Cream (acyclovir)
17375	Zovirax (acyclovir) eye ointment 3 %	Zovirax (acyclovir)
42713	Cusivral (acyclovir) eye ointment 3 %	Cusivral (acyclovir)
44957	Super-E (d- α -tocopherol) oral capsule 200 international unit	Super-E (d- α -tocopherol)
45083	Ametop (amethocaine) topical gel 4 %	Ametop (amethocaine)
39546	amoxycillin (Briht Forte) oral capsule 250 mg	amoxycillin (Briht Forte)
41459	APT-Amoxycillin (amoxycillin (as trihydrate) oral capsule 250 mg	APT-Amoxycillin (amoxycillin (as trihydrate))
55240	Blackmore V3 (diclofenac) oral capsule 100mg international unit	Blackmore V3 (diclofenac)
55241	Norvidal (nifedipine) oral tablet 30 mg	Norvidal (nifedipine)
05569	Trental (rophenidylone) oral controlled-release tablet 400 mg	Trental (rophenidylone)
33470	Predifam (prednisolone (as sodium metaphosphoborate)) rectal foam 20 mg / 1 application	Predifam (prednisolone (as sodium metaphosphoborate))
52336	Inforin (lactobacillus acidophilus + bifidobacterium bifidum) oral capsule	Inforin (lactobacillus acidophilus + bifidobacterium bifidum)
52336	Inforin (lactobacillus acidophilus + bifidobacterium bifidum) oral capsule	Inforin (lactobacillus acidophilus + bifidobacterium bifidum)
47289	Nicotinell (nicotine) buccal chewing gum (polacrilex) 2 mg (fruit)	Nicotinell (nicotine)
08279	Flamazine (sulphadiazine silver) topical cream 1 %	Flamazine (sulphadiazine silver)
31228	Dermain (sulphadiazine silver) topical cream 1 %	Dermain (sulphadiazine silver)
37804	Brudermia (sulphadiazine silver) topical cream 1 %	Brudermia (sulphadiazine silver)
35575	Solmucol 100 (acetylcysteine) oral granules 100 mg / sachet	Solmucol 100 (acetylcysteine)
45131	Fluimucil (acetylcysteine) oral granules 100 mg / sachet	Fluimucil (acetylcysteine)
49037	Mufamso (acetylcysteine) oral granules 100 mg / sachet	Mufamso (acetylcysteine)
45130	Fluimucil (acetylcysteine) oral granules 200 mg / sachet	Fluimucil (acetylcysteine)
35729	Solmucol 600 (acetylcysteine) oral granules 600 mg / sachet	Solmucol 600 (acetylcysteine)
43391	Fluimucil A (acetylcysteine) oral granules (sugar-free) 100 mg / sachet	Fluimucil A (acetylcysteine)
43411	Fluimucil A (acetylcysteine) oral granules (sugar-free) 200 mg / sachet	Fluimucil A (acetylcysteine)

prepare

MTT Data Content

[illegible]

compile Editorial Policies

