ihtsdo Leading healthcare terminology, worldwide

Managing medicines and devices

Development and use of a medical devices terminology

International development overview

Panel discussion on SNOMED CT use in medicines management

Delivering SNOMED CT The global language of healthcare

Medical devices

Sean Dougherty
PHARMAC

Background

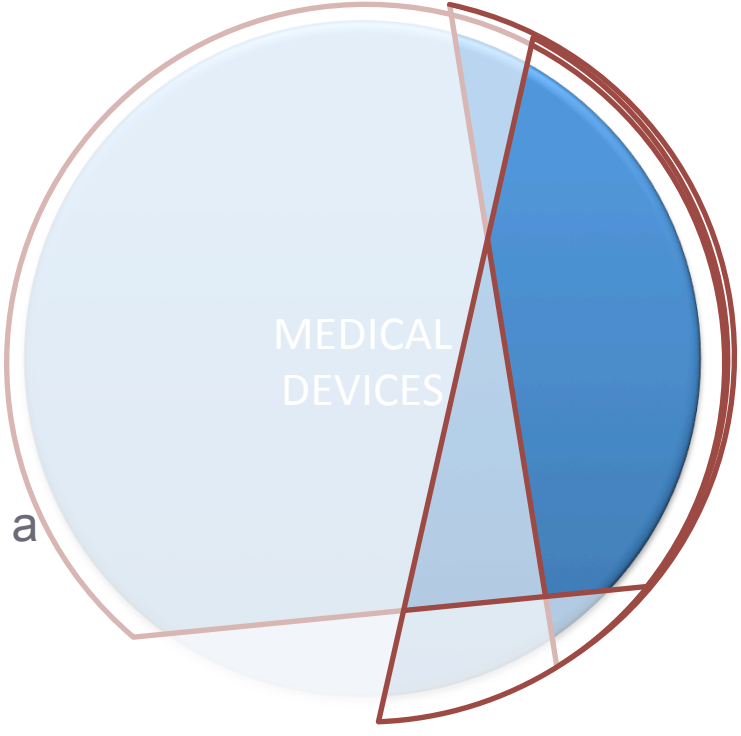
- We lack a consistent approach to both coding and terminology for medical devices. Increased central interest in medical devices highlights the need for this to change.
- There is significant interest in medical devices across health sector agencies and in the private sector, and this is expected to increase over time. The needs of these parties can differ substantially.
- Existing international solutions tend to be relatively useful for grouping medical devices, but less useful for identifying them.

Pharmaceutical Management Agency (PHARMAC)

- PHARMAC is responsible for managing the New Zealand Government's expenditure on medicines, and in the future, medical devices through the Pharmaceutical Schedule
  - National procurement
  - New technology adoption
  - Setting clinical criteria for funding
- We need medical device information that is:
  - Broad
  - Granular
  - Hierarchical

Different roles, different interests

- Formulary management
  - Funding / clinical information about individual products
  - Interest in most medical devices at a detailed level
- Decision support
  - Additional information for clinicians
  - Interest in some medical devices, likely at a higher level
- Electronic health records
  - Relevant medical history for individuals
  - Interest in some medical devices, likely at a detailed level



Medical devices

- *'Medical device'* covers a wide range of products:
  - implantable devices (orthopaedics, stents)
  - consumables (needles, wound care)
  - diagnostic equipment
- They have varying levels of variability
- While quite different to medicines, there are common features
  - Clinical warnings
  - Allergies and contraindications
  - Recalls

Significant variation

Guide wires

- Type
- Length
- Strength
- Tip
- Core

1000 variations

Wound dressings

- Size
- Absorption
- Adherence
- Sterility
- Antimicrobial activity

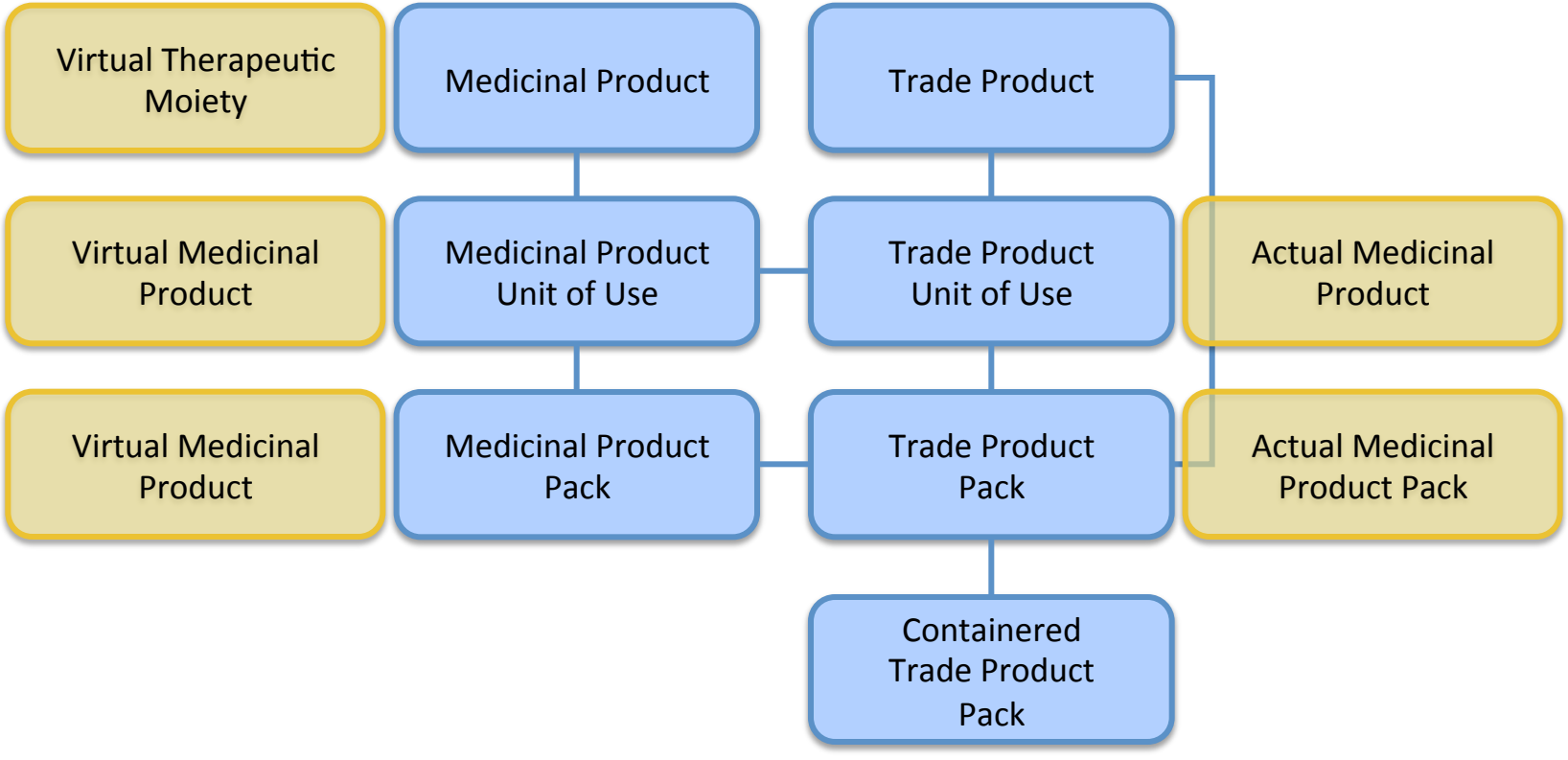
2000 variations

Sutures

- Needle shape
- Needle gauge
- Suture gauge
- Suture length
- Composition
- Absorbability
- Surface type
- Colour

4000 variations

New Zealand Medicines Terminology

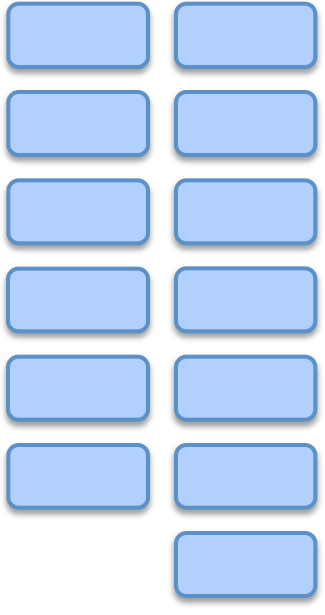


Medicines terminology

- A standardised terminology with agreed editorial rules
- A single approach to clinical coding for medicines across the sector
- An ability for information to be provided at a general concept level and cascaded down to individual products
- An ability for data to be collected at a granular level and easily aggregated for data analysis
- A tool to support clinical decision making, including interactions, contraindications and other alerts.

Preferred approach

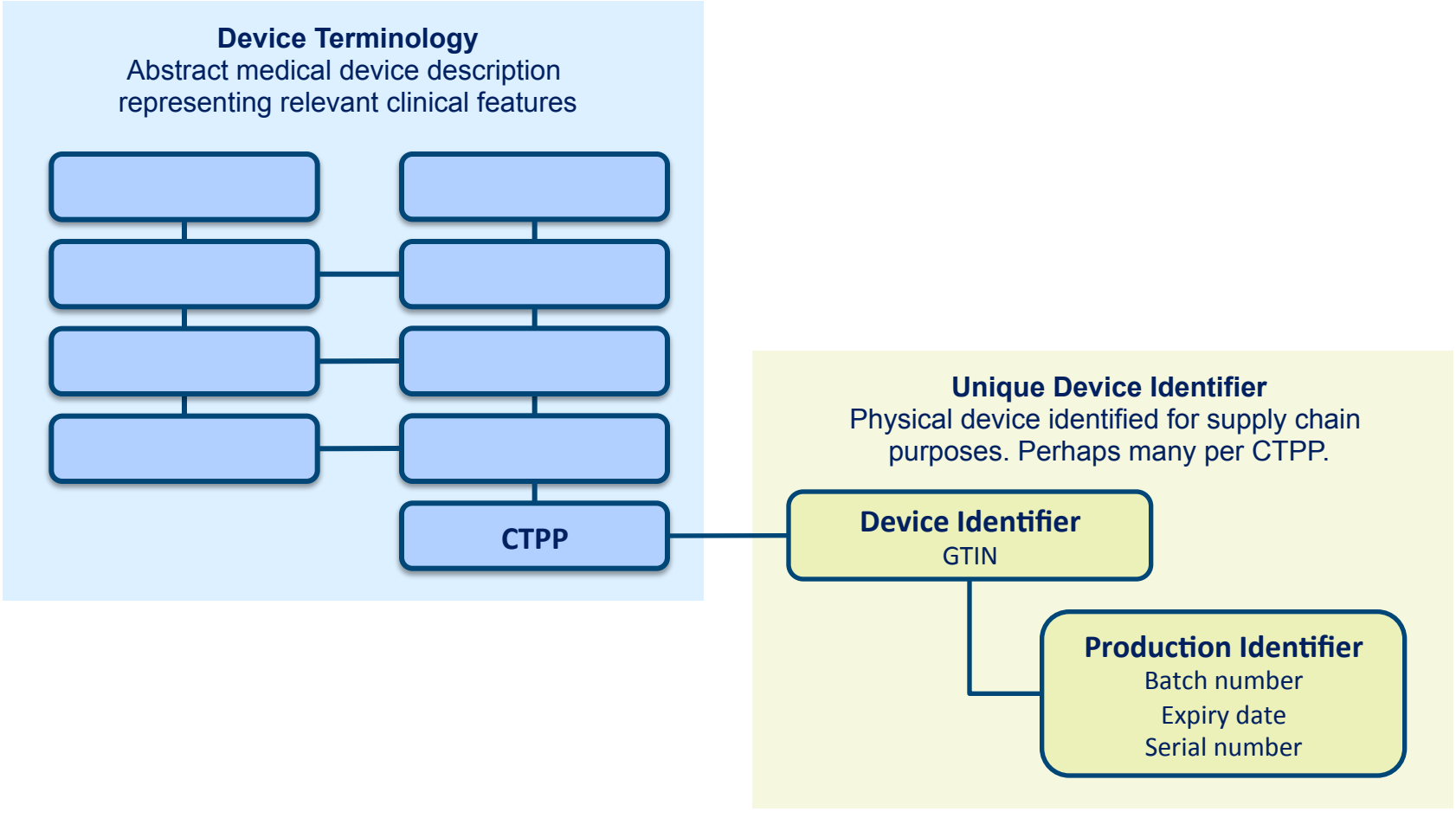
- Devices terminology based on the format used for medicines
- More layers of detail to account for greater degrees of clinical differentiation between products
- A better understanding of use cases will be needed to understand how much a devices terminology would need to expand beyond the 5/7 concept model used for medicines
- Does not appear that existing device nomenclatures can be repurposed for this task



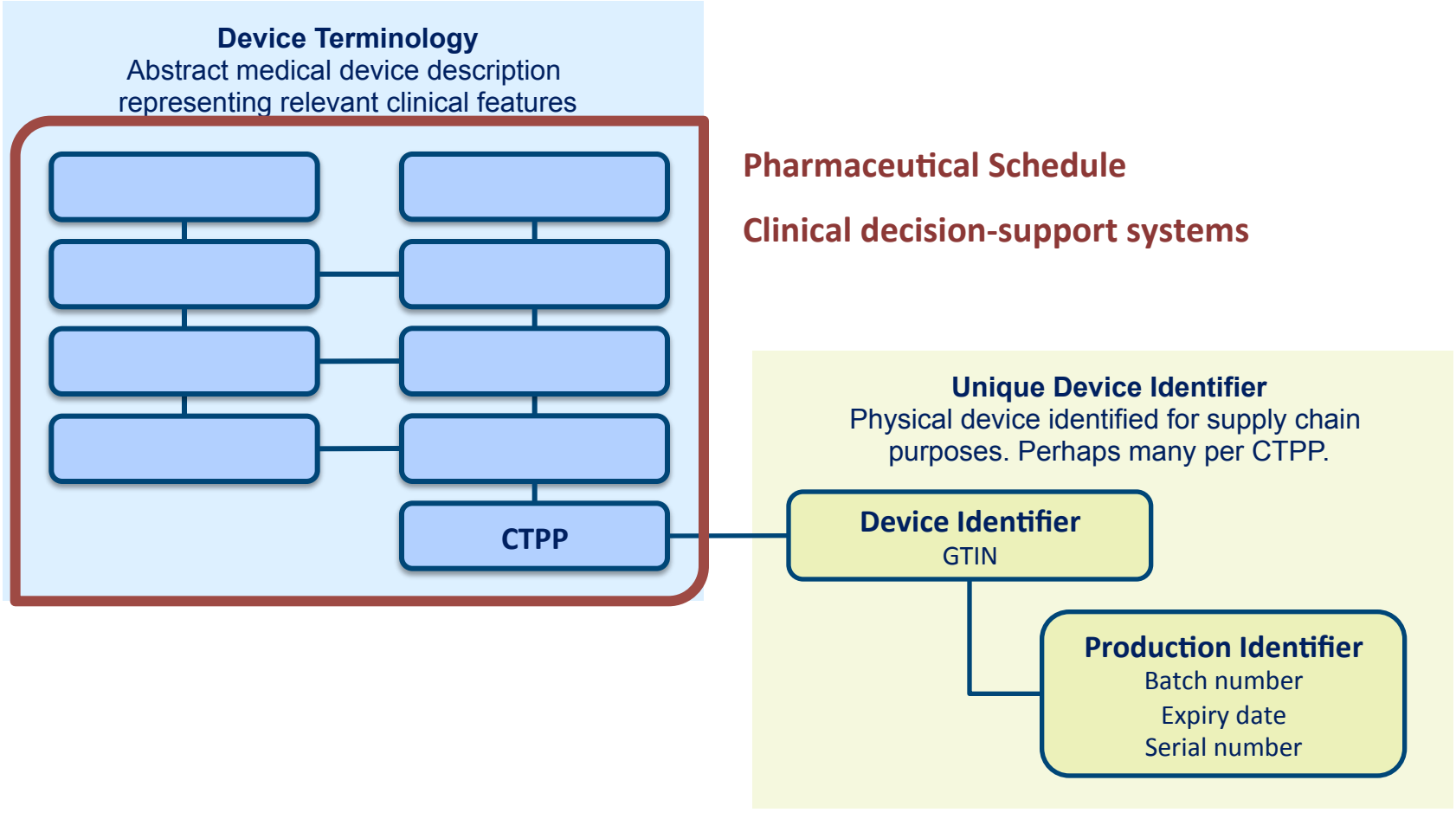
Unique Device Identifier (UDI)

- UDIs identify physical products, available in a variety of machine-readable formats
- Device identifier
  - Global Trade Item Numbers (GTINs) are expected to become the NZ standard for supply chain information for medical devices
- Production identifier
  - batch number
  - expiry date
  - serial number
- We see the UDI as forming an important part of the overall coding package for medical devices

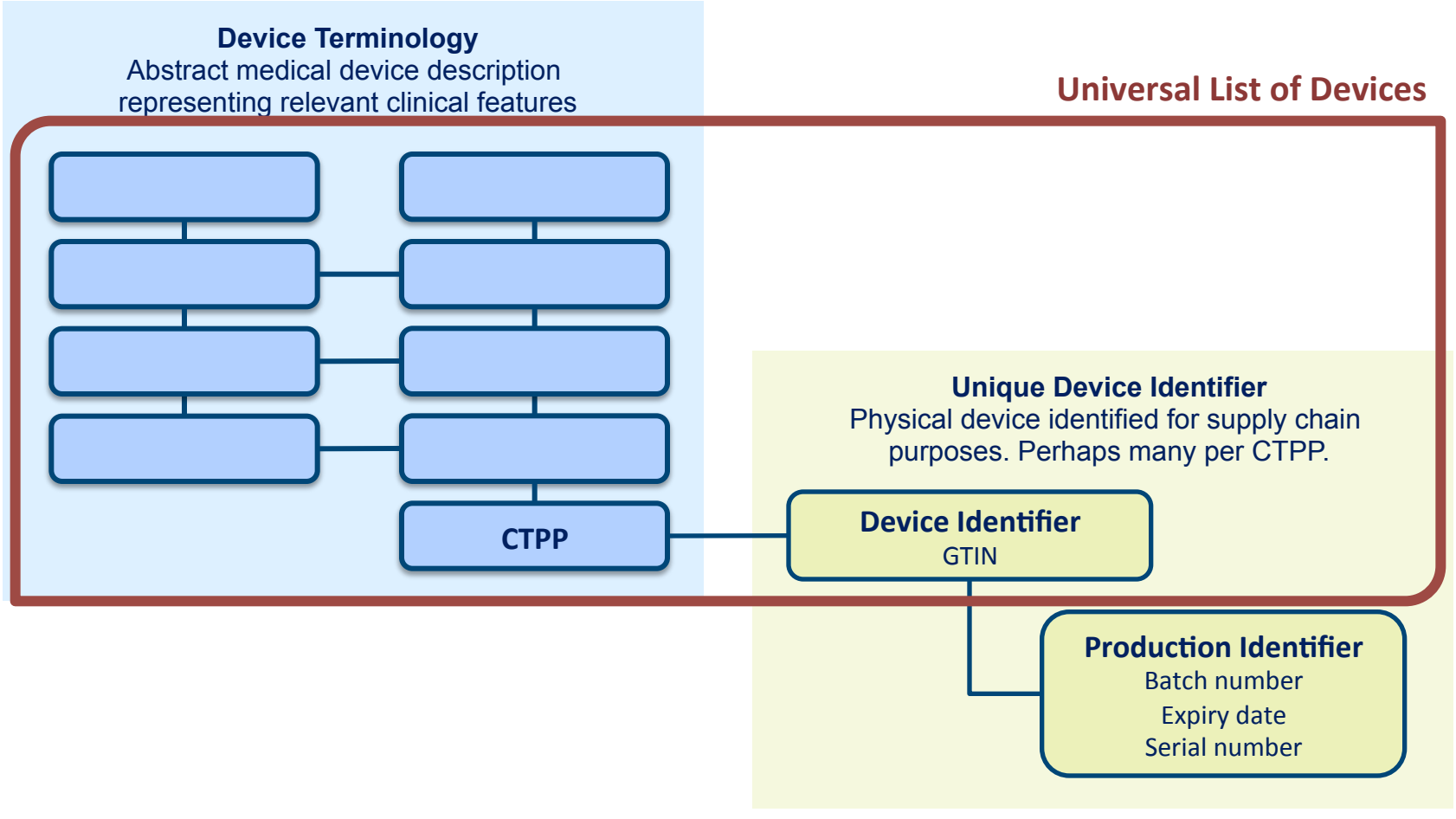
Combined implementation



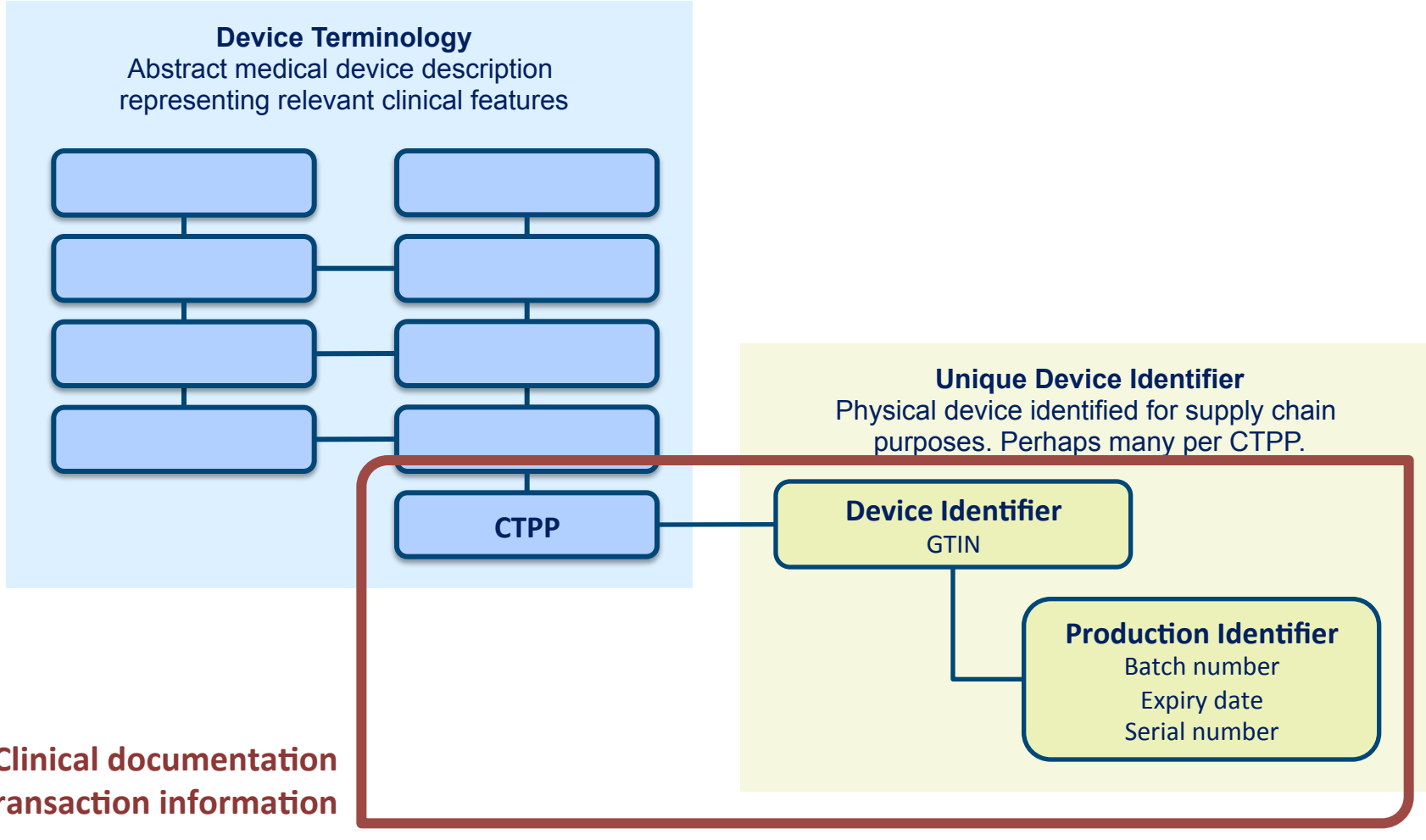
Combined implementation



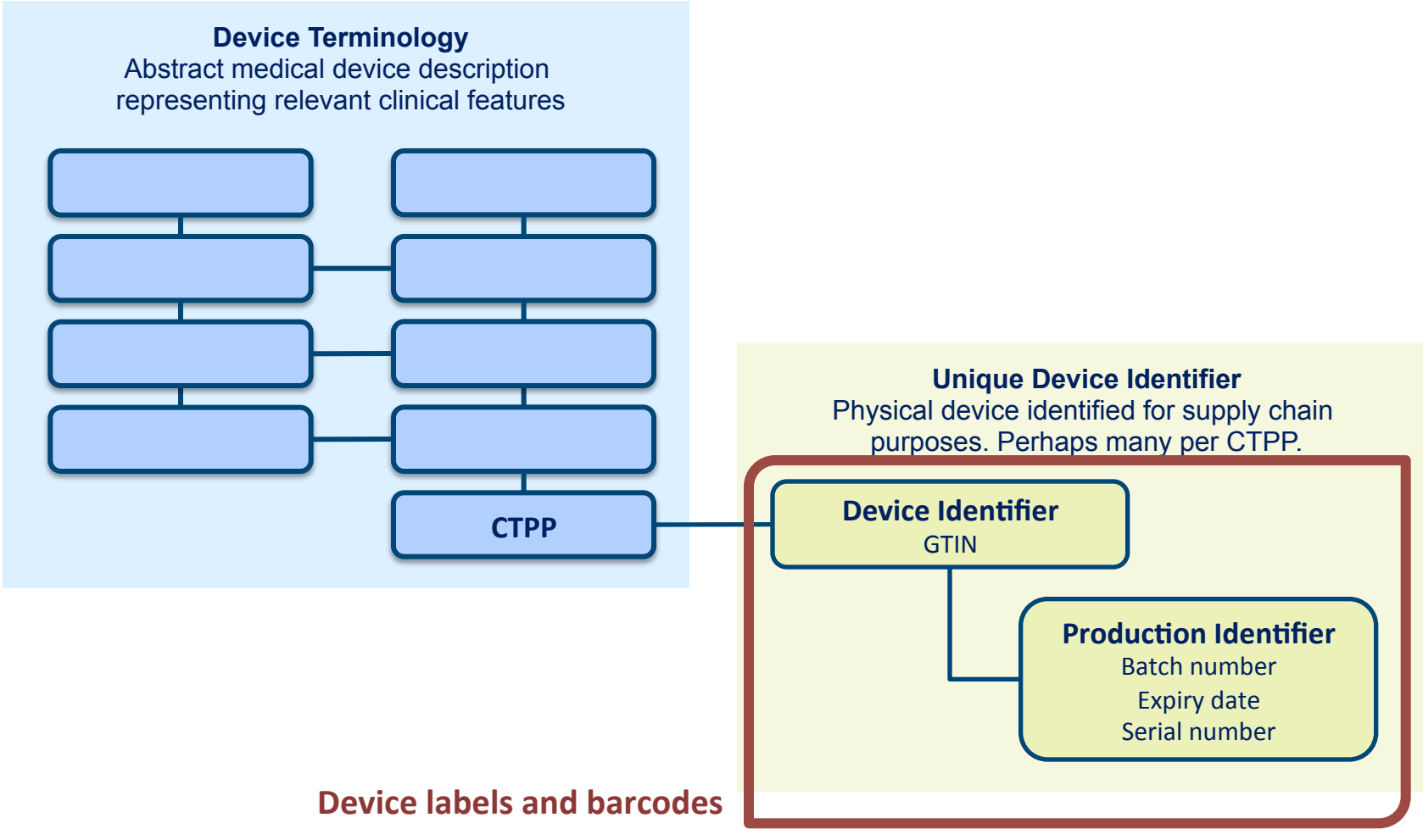
Combined implementation



Combined implementation



Combined implementation



Concept in action

Prior to use

Device terminology

- Clinical decision support systems highlight any potential allergy issues, contraindications or clinical warnings
- Relevant clinical funding criteria are noted

Device terminology + UDI

- Correct brands are procured
- Notification of any stock shortage issues in advance of procedures

Concept in action

At time of use

Device terminology + UDI

- Verification of product (barcode / RFID)
- Population of:
  - patient's electronic health record
  - transactions data sets
  - device registry

Concept in action

Subsequent to use

Device terminology

- Identification and monitoring of patients with a category of medical devices
- Monitoring of usage (over/under/misuse) by funders

Device terminology + UDI

- Identification of patients given a medical device within a particular batch or serial number range

ihtsdo Leading healthcare terminology, worldwide

International development overview

Toni Morrison (IHTSDO)

Delivering SNOMED CT The global language of healthcare

Devices

- Investigating and analyzing existing devices concept models, requirements and use cases of Member countries to provide a basis for model design
- Developing a SNOMED CT concept model for the representation of devices at the international and national levels
    - Determining the boundary between international and national parts of the model
- Using expertise to agree on a plan for iterative concept model development

Devices, cont.

- Project details, including windows of opportunity for review and comment, can be found on IHTSDO collaborative space:

  https://confluence.ihtsdotools.org/display/IAP/Devices+Projects

Drugs

- The primary objective of the Drug Default Model Group is to develop a default model for the representation of drugs in the international edition and national drug extensions
- The model will be based on the SNOMED CT concept model, but take the representation beyond that of drug content included in the SNOMED CT International Release
- It will also consider other international standards such as IDMP standards, where relevant

Drugs, cont.

- Project details, including windows of opportunity for review and comment, can be found on IHTSDO collaborative space:

  https://confluence.ihtsdotools.org/display/IAP/Drug+Model+-Directory

ihtsdo Leading healthcare terminology, worldwide

SNOMED CT use in medicines management

David Mitchell, Bryan Simpson, David Woods, Rob Ticehurst

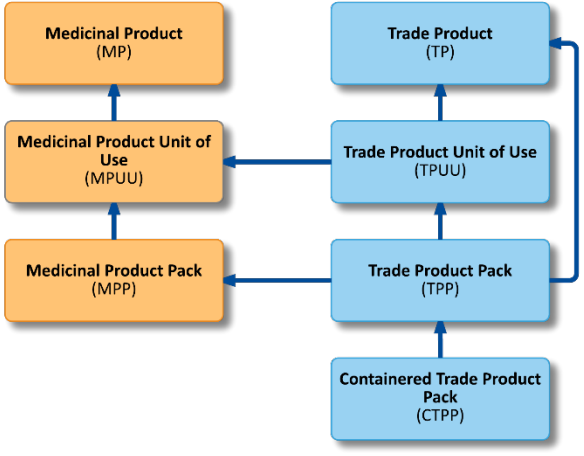
Delivering SNOMED CT The global language of healthcare

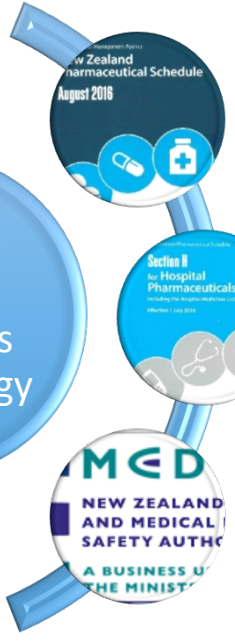
A national medicine information resource based on SNOMED CT

David Mitchell,
Lead Terminologist, New Zealand Universal List of Medicines

NZULM information components

Descriptions, identifiers & atomised data





Pharmaceutical Schedule

- Medicines & devices subsidised for community care
- Subsidy codes, rules and values

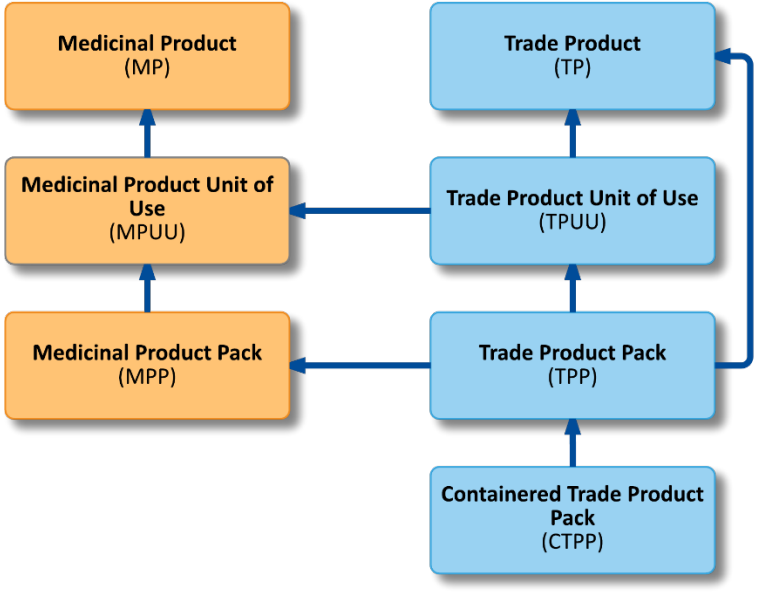
Hospital Medicines List

- Medicines funded for community care
- Funding codes, rules and values

Medsafe consents

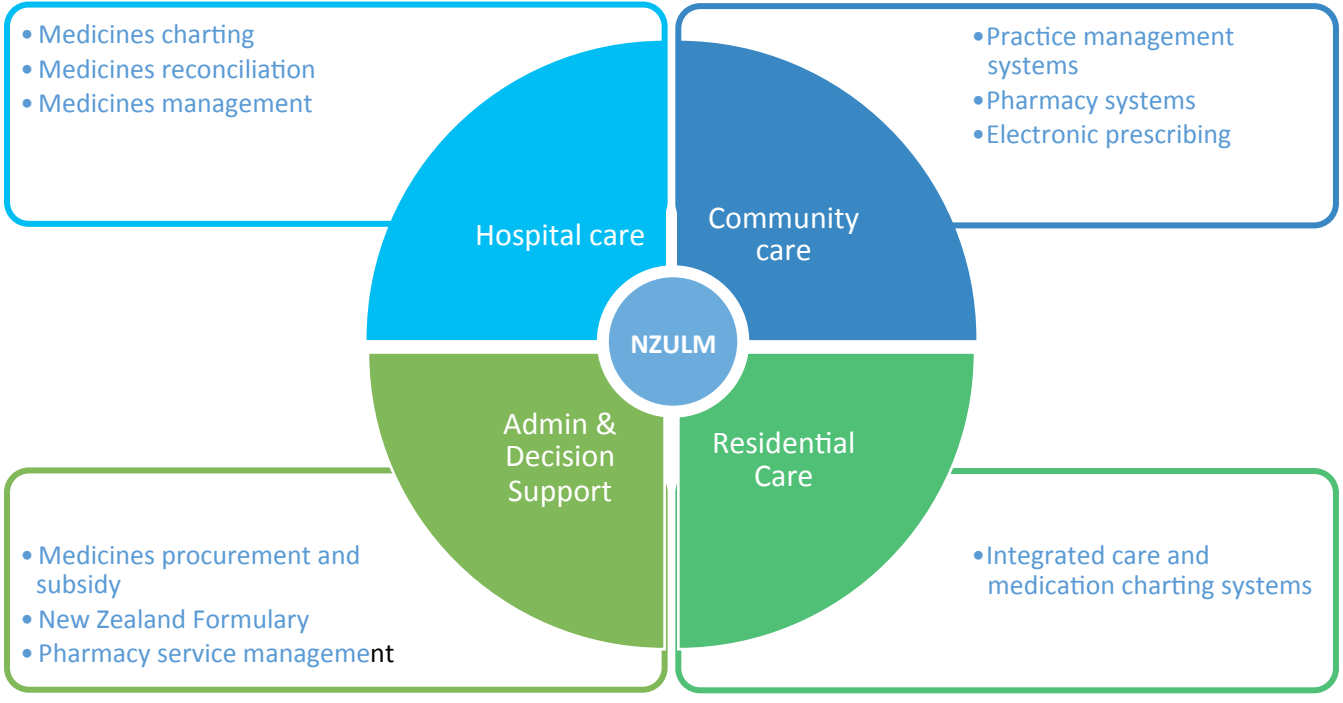
- Sponsor
- Formulation
- Legal status & restrictions
- Data sheets & CMI sheets

The New Zealand Medicines Terminology

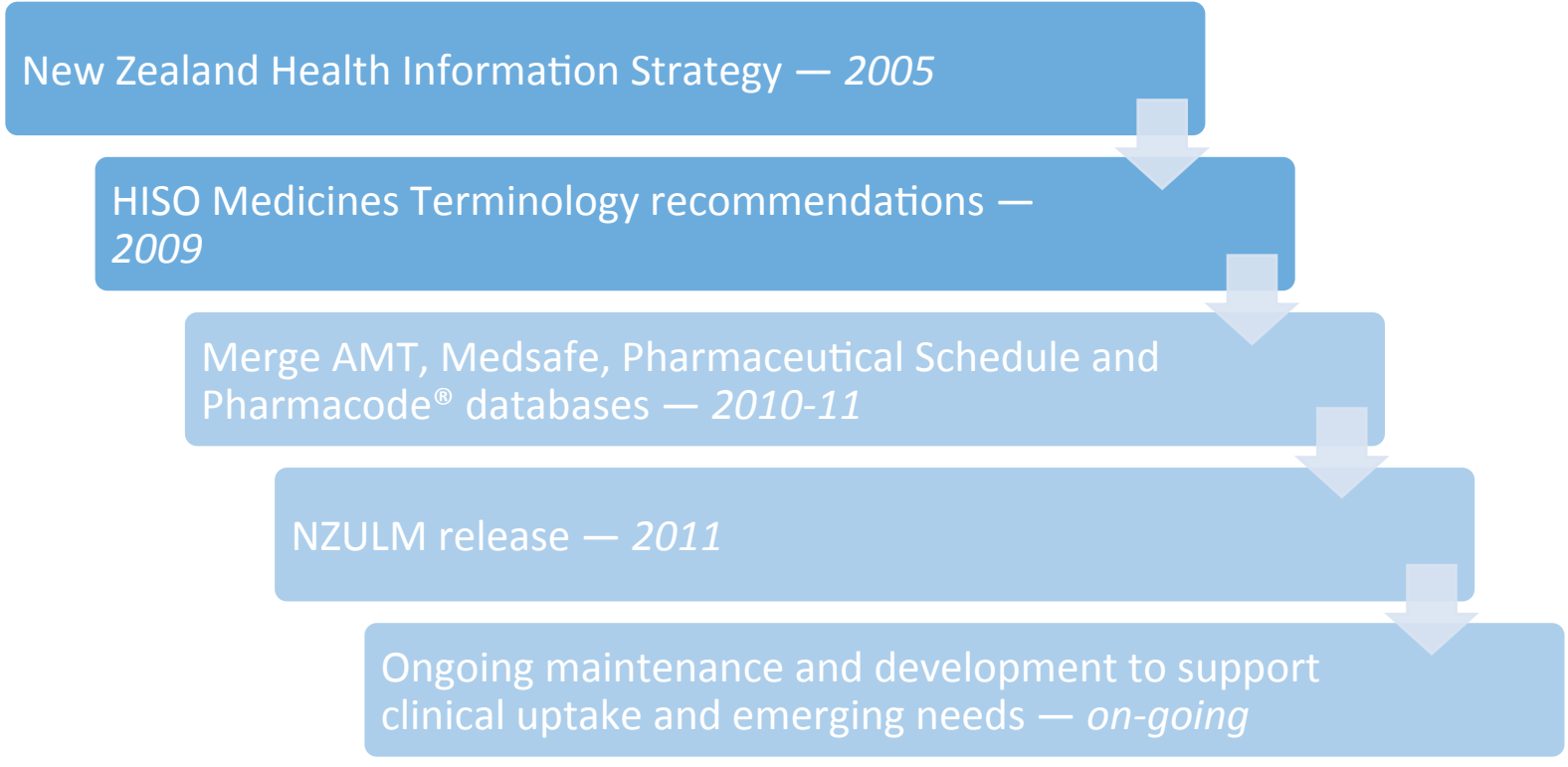


- SNOMED CT identifiers
- Based on:
  - Australian Medicines Terminology data model
  - Australian Medicines Terminology editorial rules
- Adapted for New Zealand needs
  - Alternate descriptions tailored for clinical Use Cases
- Provides foundation for the NZULM
  - Other data sources linked via identifiers

National roll-out



Key milestones



Lessons learned

Clinical implementation is everything but one size doesn't fit all	•Clinical guidance and input during development is essential •Current clinical practices and perceived risks are significant barriers to adoption •Flexibility without compromising core data integrity supports uptake
The size of the challenge to build the resource can't be over-estimated	•Building on existing data sources saves time but carries its own risks •Linking listing processes to other official processes and requirements builds overall support and drives participation and uptake
External standards beyond editorial rules and technical requirements are essential	•National standards for data presentation •Mechanisms for responding to emerging Use Cases are needed
Unintended and unexpected consequences are an ever present risk	•Multiple user groups draw on the same resource •Managing competing user needs requires careful balancing

Lessons learned

Every implementation is different	• Vendor and user needs differ. They determine how the resource is used. • Aim to achieve overarching coherence across systems
Successful implementations require data provider support	• Demonstrate data integrity and build confidence • Support to understand a complex data resource is essential • Provide common resources to simplify implementation and resolve recurring issues
Recognise the challenges of inserting new data into existing systems	• Expecting substantial changes in design and user experience is optimistic • Compromise is inevitable but it needs to be guided by long term objectives

The New Zealand Formulary

SNOMED CT Coded Indications in a National Formulary

The New Zealand Formulary

"a resource for healthcare professionals prescribing, dispensing and administering medicines across primary and secondary care. It addresses their need for general purpose, point of care information about the use of medicines in NZ"

The New Zealand Formulary

The New Zealand Formulary

Capsula Filicis 15 min. (*Caps. Filic.*)
Extract of Male Fern.
Dose: 1 to 2 capsules.

Enema Quassiæ (*Enem. Quass.*)
An infusion of a strength of 1 in 100 should be made with rasped quassia wood and cold water. Alternatively, the strong Infusion of Quassia may be diluted 10 times.
The quantity to be given is 20 fl. oz.

Tabella Santonini 1 gr. (*Tab. Santonin.*)
Dose: 1 to 3 gr.

Tabella Santonini Composita (*Tab. Santonin. Co.*)

Santonin	½ gr.
Mercurous Chloride	½ gr.

Oleum Chenopodii (*Ol. Chenopod.*)
Dose: 3 to 15 min. Dispensed in capsules.

CARDIOVASCULAR SECTION

CARDIAC

Tabella Digitalis Pulveratæ 1 gr. (*Tab. Digit. Pulverat.*)

NOTE.—1 gr. of Powdered Digitalis is equivalent to 10 min. of Tincture of Digitalis.

Tabella Digoxini 0·25 mg. (*Tab. Digoxin.*)
Dose: ¼ to 1 mg.

*** Mistura Digitalis** (*Mist. Digit.*)

Tincture of Digitalis	10 min.
Compound Tincture of Cardamom	15 min.
Water .. .. .. to	½ fl. oz.

*** Digitalis is best administrated in the form of Digitalis Pulverata.**

Pilula Digitalis Composita B.P.C. (*Pil. Digit. Co.*)

Powdered Digitalis	1 gr.
Squill, in powder	1 gr.
Pill of Mercury	1 gr.

Injectio Strophanthini $\frac{1}{250}$, $\frac{1}{100}$ gr. (*Inj. Strophanthin.*)
Dose: $\frac{1}{250}$ to $\frac{1}{60}$ gr. (0·25 to 1 mg.)

Injectio Ouabaini (*Inj. Ouabain.*)
Dose: ¼ to 1 mg.

Injectio Digoxini 0·5 mg. (*Inj. Digoxin.*)
Dose: ½ to 1 mg.

Tabella Quinidinæ Sulphatis 3 gr. (*Tab. Quinid. Sulph.*)
Dose: 3 to 10 gr.

VASCULAR

Capsula Amylis Nitritis 3, 5 min. (*Caps. Amyl. Nitrit.*)

Tabella Glycerylis Trinitratis $\frac{1}{100}$ gr. (*Tab. Glyc. Trinit.*)
(Synonym: Trinitrin Tablet.)

[P.P.] Tabella Phenobarbitoni et Theobrominæ B.P.C. (*Tab. Phenobarbiton. et Theobromin.*)

Phenobarbitone	½ gr.
Theobromine	5 gr.

*** Tabella Calcii Lactatis** 5 gr. (*Tab. Calc. Lact.*)
* Or Calcium Gluconate, if Calcium Lactate is not obtainable.

DIURETIC

Injectio Mersalyli B.P. (*Inj. Mersalyl.*)
Contains 10 per cent. w/v of Mersalyl.
Dose: ½ to 2 mil. (8–30 min.)

The New Zealand Formulary

View in the NZFC

digoxin

Indications heart failure (see also section 2.5.5); supraventricular arrhythmias (particularly atrial fibrillation and atrial flutter; see also section 2.3.2)

Contra-indications intermittent complete heart block; second degree AV block; supraventricular arrhythmias associated with accessory conducting pathways e.g. Wolff-Parkinson-White syndrome; ventricular tachycardia or fibrillation; hypertrophic cardiomyopathy (unless concomitant atrial fibrillation and heart failure—but use with caution); myocarditis; constrictive pericarditis (unless to control atrial fibrillation or improve systolic dysfunction—but use with caution)

Cautions recent myocardial infarction; sick sinus syndrome; thyroid disease; reduce dose in the elderly; severe respiratory disease; hypokalaemia, hypomagnesaemia, hypercalcaemia, and hypoxia (risk of digitalis toxicity); monitor serum electrolytes and renal function; avoid rapid intravenous administration (risk of hypertension and reduced coronary flow); cardiac amyloidosis

Interactions Stockley's alerts: digoxin; BNF summary: digoxin

Renal impairment reduce dose and monitor plasma-digoxin concentration; toxicity increased by electrolyte disturbances

Pregnancy A ; may need dosage adjustment

Breast-feeding compatible eTG complete

Adverse effects see Cardiac glycosides; also nausea, vomiting, diarrhoea, arrhythmias, conduction disturbances, dizziness, blurred or yellow vision, rash, eosinophilia; *less commonly* depression; *very rarely* anorexia, intestinal ischaemia and necrosis, psychosis, apathy, confusion, headache, fatigue, weakness, gynaecomastia on long-term use, thrombocytopenia

Dose

Child and neonate see NZF for Children

Atrial fibrillation and atrial flutter

Oral

Rapid oral loading

Adult 0.75–1.5 mg over 24 hours in divided doses

Maintenance (according to renal function, clinical response and drug concentration monitoring)

Adult usual range 62.5–250 micrograms daily

Emergency loading dose [unapproved indication]

Intravenous infusion

Adult 0.75–1 mg over at least 2 hours (see also Cautions), then maintenance dose by mouth on the following day

Heart failure (for patients in sinus rhythm)

Oral

Adult usual maintenance dose 62.5–125 micrograms once daily

Note

The above doses may need to be reduced if digoxin has been given in the preceding 2 weeks. When switching from intravenous to oral route may need to increase dose by 20–33% to maintain the same plasma-digoxin concentration. For plasma concentration monitoring, blood should be taken at least 6 hours after a dose.

The New Zealand Formulary

1992	•Department of Health RFP
2002	•PHARMAC EOI
2007	•PHARMAC / DHBNZ Business Case
2008	•Budget funding for the NZMF
2009/10	•NZULM created
2010/11	•NZF RFP
2011	•NZMF Limited Partnership formed and awarded 10 year contract to deliver and maintain the NZF and NZF for children
2012	•NZF released 23rd July

The New Zealand
Formulary

PHARMAC
Pharmaceutical Management Agency

MEDSAFE

New Zealand GUIDELINES GROUP
Te Rōpū Rarangi Tohutohu

NZULM
NEW ZEALAND UNIVERSAL LIST OF MEDICINES

HEALTH QUALITY & SAFETY COMMISSION NEW ZEALAND

bpac nz
better medicine

eTG complete

WORLD ANTI-DOPING AGENCY
play true

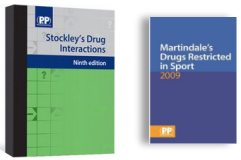
Australian Government
Department of Health and Ageing
Therapeutic Goods Administration

THE COCHRANE COLLABORATION

World Health Organization

NHS
National Institute for Health and Clinical Excellence

NEW ENGLAND JOURNAL OF MEDICINE



Universities
DHBs
GPs

NZ specific

international

BNF

supporting

clinical experts

The New Zealand Formulary

NZULM
NEW ZEALAND UNIVERSAL LIST OF MEDICINES

NZ specific data

clinical experts

supporting data

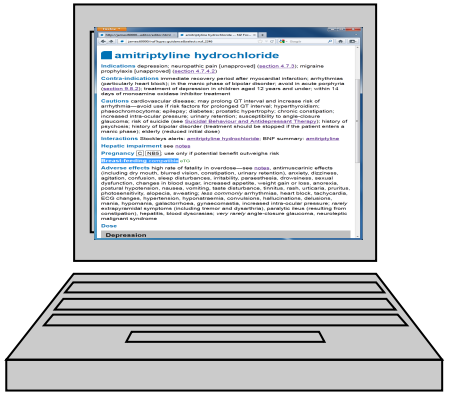
international data

BNF data

Editorial Advisory Board

NZF editorial team

BNF editorial team



The New Zealand Formulary

SNOMED CT

The New Zealand Formulary

New Zealand adverse events reported for 2012–13 include:

- 179 clinical management events
  - delays in treatment
  - concerns about the accuracy of diagnoses
  - inadequate patient monitoring in hospital
  - and near misses
- 24 medication events
  - 11 related to administration of an incorrectly prescribed drug or drug dose.

Making health and disability services safer —Serious Adverse Events report 2012–13 (HQSC)

The New Zealand Formulary

Meaningful Objectives

- Improve quality, safety, efficiency and reduce disparities
- Engage patients
- Improve coordination of care
- Improve population health and interact with public health programs

The New Zealand Formulary

Alerts & Reminders

- May reduce errors through timely information about
  - Indications
  - Contra-indications
  - Drug-Drug interactions
  - Appropriate dose ranges
  - Drug allergies
  - Drug-Food interactions
  - Precautions for specific drug-disease combinations
  - Relevant abnormal laboratory test results (e.g. rising creatinine levels)

The New Zealand Formulary

colchicine

Indications acute gout; short-term prophylaxis of gout [unapproved]; acute pericarditis [unapproved]; recurrent pericarditis [unapproved]

Contra-indications severe renal impairment; severe hepatic impairment; blood disorders; children

Cautions elderly; gastro-intestinal disease; cardiac disease; see also SafeRx bulletin: Colchicine—Safe Prescribing

Risk of serious toxicity if recommended dose is exceeded; see also HQSC Medication Alert-Colchicine

Interactions Stockley's alerts: colchicine; BNF summary: colchicine

Hepatic impairment use with caution

Renal impairment reduce dose or increase dosage interval if eGFR 10–50 mL/minute/1.73 m^2; avoid if eGFR less than 10 mL/minute/1.73 m^2

The New Zealand Formulary

Alert Examples—Indications

- Diagnosis: Acute Gout
- Rx: Colchicine

The New Zealand Formulary

Alert Examples—Contra-Indications

Diagnosis: Acute gout

Rx: Colchicine

Previous Clinical Finding: Haemophilia

The New Zealand Formulary

Challenges

- **≈3000 individual indications**

  ≈350 directly match SCT

- **≈2000 individual contra-indications**

  ≈ 300 directly match SCT

The New Zealand Formulary

Troublesome Indications

Example:

- prevention of gastrointestinal haemorrhage when ulcers present
- benign gastric and duodenal ulcers
- benign gastric and duodenal ulceration
- duodenal and benign gastric ulcer
- benign gastric ulcer

The New Zealand Formulary

Troublesome Contra-Indications

Example:

- blood disorders
  - ? Haemophilia
  - ? Blood clots
  - ? Anaemia
  - ? Leukaemia
  - ? Lymphoma
  - ? Myeloma

The New Zealand Formulary

What Next?

Image source: Learning about SNOMED CT
A road map to SNOMED CT training, documentation and other resources
(https://elearning.ihtsdotools.org/pluginfile.php/653/mod_resource/content/2/ELSP_FA01_LearningAboutSnomed_s2_20160630.pdf)

The New Zealand Formulary

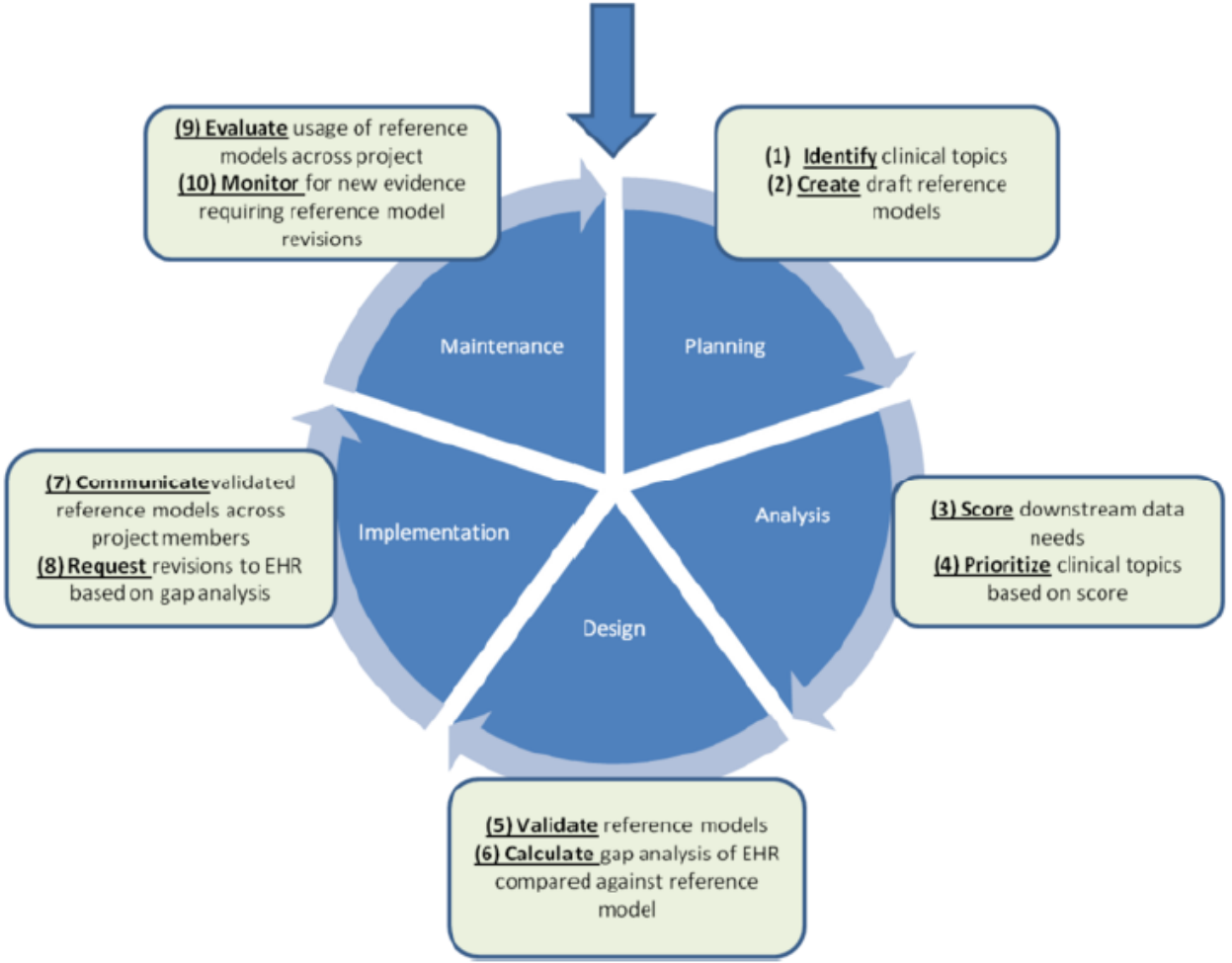


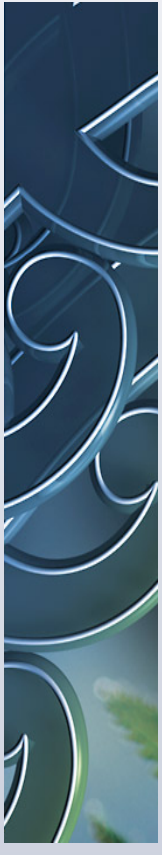
Figure 1 - Practical Approach for Data Governance for Structured Data Elements

A Practical Approach to Governance and Optimization of Structured Data Elements
S.A. Collins *et al*
Studies in Health Technology and Informatics , 2015, Vol.216, p.7-11

Summary

- NZF has the potential to enable improved healthcare in New Zealand.
- Many challenges
  - Difficult technology
  - Labour intensive
  - Still evolving

The New Zealand Formulary



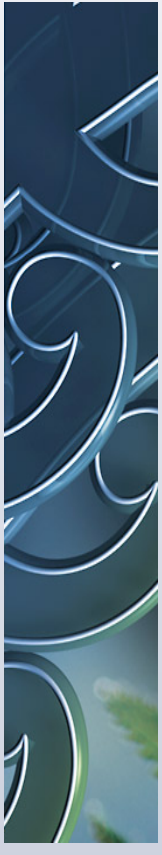
Clinical Applications
Allergy Groups

David J Woods

Clinical Adviser, New Zealand Formulary

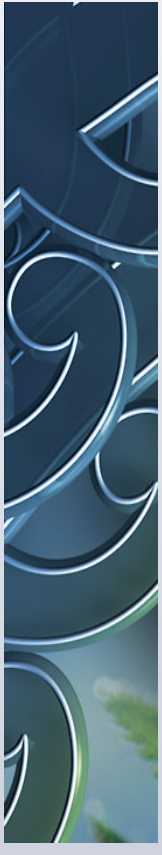
The New Zealand Formulary

General objectives



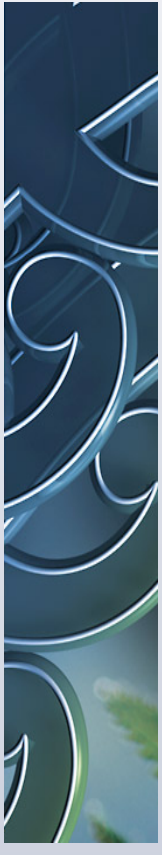
- What is a drug group?
- Basic purpose/function of an “allergy group”
- Implications for SNOMED
- Broader applications – “drug property propensity group”

Drug allergy checking



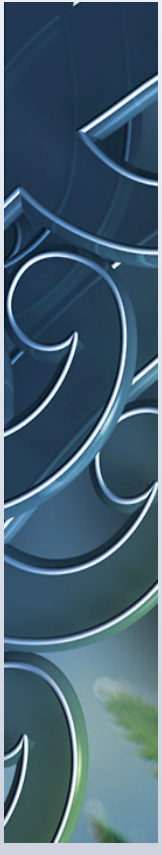
- Drug groups with common potential for drug allergy (drug hypersensitivity)
- Based on concept of cross reactivity or cross intolerance
  - beta lactam antibiotics
  - iodinated radiocontrast media
  - aromatic anti-epileptic drugs
  - ACE inhibitors

Beta lactam antibiotics



- Beta lactams
  - Penicillins
  - Cephalosporins
  - Carbapenems
- Group exists in SNOMED and in WHO ATC

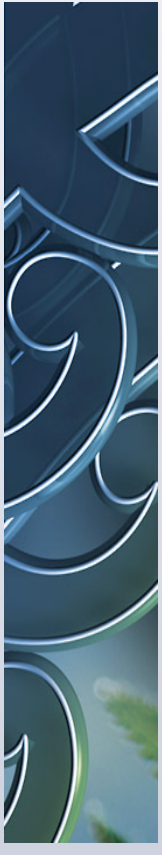
ACE inhibitors (pseudoallergy)



- Captopril
- Enalapril
- Lisinopril
- Quinapril + many others

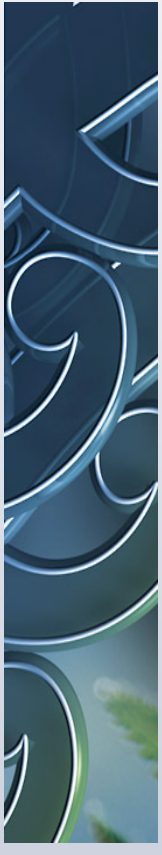
- Compatible with SCT terminology and ATC groups

Aromatic anti-epileptic drug



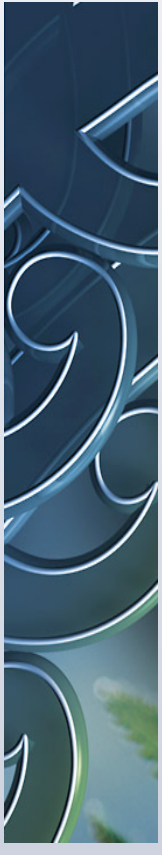
- Drugs with propensity to cause *anticonvulsant hypersensitivity syndrome (delayed hypersensitivity)*
  - Phenytoin
  - Carbamazepine
  - Phenobarbitone
  - Primidone + others
- Not described adequately in SCT or grouped in ATC

Creating drug allergy groups



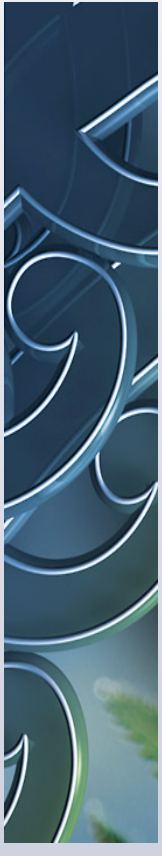
- International “open source” sets not available
- Most exist within commercial systems; expensive, no standards
- Several advantages of “home-grown” systems or an international standard for local implementation

New Zealand development



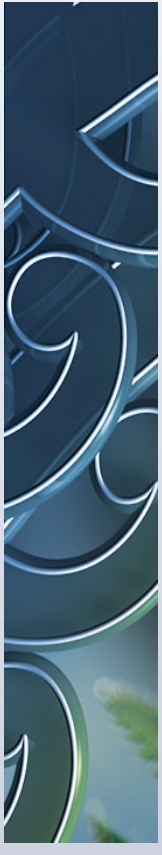
- A drug allergy group data set for national implementation – will utilise the SCT ontology that NZF is currently aligning to
- Clinical transparency, responsive to feedback and development
- Drive implementation standards

Implications and opportunities for SNOMED



- **SNOMED groups and hierarchies do not completely match with NZ drug allergy set**
  - **Complete match – *allergy to penicillins (disorder)***
  - **Partial match – *NSAID allergy (disorder)***
  - **Group absent – *aromatic anti-epileptic; thienopyridine antiplatelet***

Allergy to penicillin (disorder)

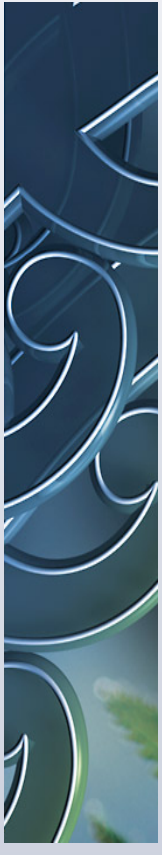


Children (6)

- ≡ Antipseudomonal penicillins allergy (disorder)
- ≡ Broad spectrum penicillins allergy (disorder)
- Combined penicillin preparation allergy (disorder)
- ≡ Mecillinam allergy (disorder)
- ≡ Penicillinase-resistant penicillins allergy (disorder)
- ≡ Penicillinase-sensitive penicillins allergy (disorder)

Complete match *but*
no higher level term beta lactam allergy disorder

NSAID allergy disorder – partial match

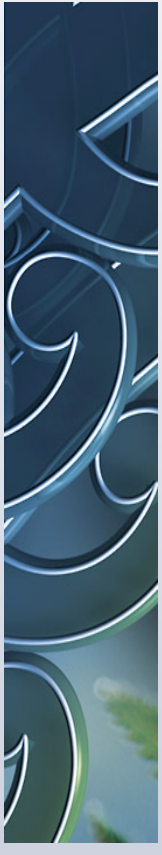


Children (25)

- ≡ Acemetacin allergy (disorder)
- ≡ Acetaminophen and dextropropoxyphene allergy (disorder)
- ≡ Azapropazone allergy (disorder)
- ≡ Diclofenac allergy (disorder)
- ≡ Dipyrone allergy (disorder)
- ≡ Etodolac allergy (disorder)
- ≡ Felbinac allergy (disorder)
- ≡ Fenbufen allergy (disorder)
- ≡ Fenoprofen allergy (disorder)……

Relationship to aspirin and COX-2 inhibitors e.g. celecoxib?

NSAID allergy disorder



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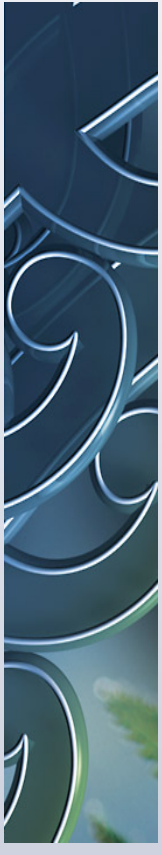
- ≡ Fenbufen allergy (disorder)
- ≡ Fenoprofen allergy (disorder)……

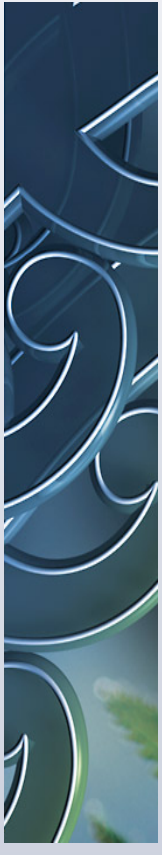
Selection "cherry picking"
to produce appropriate sensitivity

If group is absent in SNOMED?



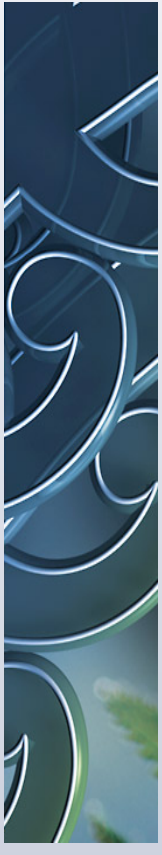
- Create rules and relationships for local implementation – *How?*
- Create relationships and groups in the international release?
- Introduce clinical governance and standards!

Drug property propensity groups



- Additional opportunities
  - Genetic predisposition to ADRs (HLA status)
  - Metabolic pathways (e.g. CYPs) and genotypes
  - Anticholinergic load
  - Fall risk
  - Banding according to dosing in renal impairment

Conclusion and vision
Maximising leverage of SNOMED CT



- A terminology with optimal relationships for implementation into clinical decision support
- Exploration of the concept of drug property propensity groups to assist in adverse event and therapeutic outcome prediction
- International standards and governance
- *That's all!*

Practical Applications

Allergies and Adverse Drug Reactions

Rob Ticehurst – Clinical Lead Pharmacist Medicines Governance & Informatics

Auckland District Health Board

It’s appropriate for me to follow the previous speakers as none of this would be possible without the foundations built by NZULM and NZF

I’ll be explaining how these can (or should) be used practically to support patient care in the context of allergy and adverse drug reaction clinical decision support

Auckland District Health Board

- Auckland City Hospital
- Starship Children's Hospital
- Greenlane Clinical Centre
- Community rehab and mental health
- 8000 FTE
- 1477 medical staff
- Budget $2 billion
- Population of ≈0.5 million
- Over 10,000 inpatient admissions each month

Electronic Systems at ADHB

Over 500 electronic clinical applications in use

- eReferrals – RMS [Orion]
- Electronic Discharge Summaries (eDS) – Concerto [Orion]
- Electronic Medicines Reconciliation (rolling out) – Concerto [Orion]
- Electronic Prescribing & Administration (two wards) – MedChart [CSC]
- Scanning of clinical notes on discharge – ChartView [3M]

Allergies and ADRs

Manual paper recording process

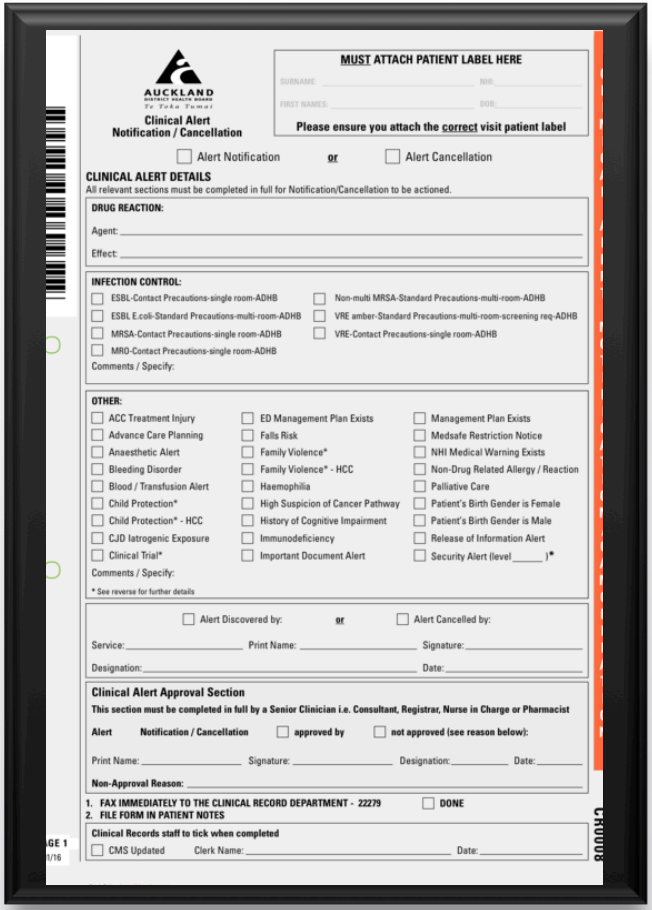
- Completed by Doctor, Pharmacist, Nurse

Data clerk enters into Patient Administration System (PAS)

- Generic warning – not drug or reaction specific

Automatically uploaded to National Medical Warning System (NMWS)

- Available for viewing by other National users of NMWS



AUCKLAND DISTRICT HEALTH BOARD
Te Toka Tumai

Clinical Alert Notification / Cancellation

MUST ATTACH PATIENT LABEL HERE

SURNAME: NHI:
FIRST NAMES: DOB:

Please ensure you attach the correct visit patient label

☐ Alert Notification or ☐ Alert Cancellation

CLINICAL ALERT DETAILS
All relevant sections must be completed in full for Notification/Cancellation to be actioned.

DRUG REACTION:
Agent:
Effect:

INFECTION CONTROL:
- ☐ ESBL-Contact Precautions-single room-ADHB
- ☐ ESBL E.coli-Standard Precautions-multi-room-ADHB
- ☐ MRSA-Contact Precautions-single room-ADHB
- ☐ MRO-Contact Precautions-single room-ADHB
- ☐ Non-multi MRSA-Standard Precautions-multi-room-ADHB
- ☐ VRE amber-Standard Precautions-multi-room-screening req-ADHB
- ☐ VRE-Contact Precautions-single room-ADHB

Comments / Specify:

OTHER:
- ☐ ACC Treatment Injury
- ☐ Advance Care Planning
- ☐ Anaesthetic Alert
- ☐ Bleeding Disorder
- ☐ Blood / Transfusion Alert
- ☐ Child Protection*
- ☐ Child Protection* - HCC
- ☐ CJD Iatrogenic Exposure
- ☐ Clinical Trial*
- ☐ ED Management Plan Exists
- ☐ Falls Risk
- ☐ Family Violence*
- ☐ Family Violence* - HCC
- ☐ Haemophilia
- ☐ High Suspicion of Cancer Pathway
- ☐ History of Cognitive Impairment
- ☐ Immunodeficiency
- ☐ Important Document Alert
- ☐ Management Plan Exists
- ☐ Medsafe Restriction Notice
- ☐ NHI Medical Warning Exists
- ☐ Non-Drug Related Allergy / Reaction
- ☐ Palliative Care
- ☐ Patient's Birth Gender is Female
- ☐ Patient's Birth Gender is Male
- ☐ Release of Information Alert
- ☐ Security Alert (level_____)*

Comments / Specify:
* See reverse for further details

☐ Alert Discovered by: or ☐ Alert Cancelled by:
Service: Print Name: Signature:
Designation: Date:

Clinical Alert Approval Section
This section must be completed in full by a Senior Clinician i.e. Consultant, Registrar, Nurse in Charge or Pharmacist
Alert Notification / Cancellation ☐ approved by ☐ not approved (see reason below):
Print Name: Signature: Designation: Date:
Non-Approval Reason:

1. **FAX IMMEDIATELY TO THE CLINICAL RECORD DEPARTMENT - 22279** ☐ **DONE**
2. **FILE FORM IN PATIENT NOTES**

Clinical Records staff to tick when completed
☐ CMS Updated Clerk Name: Date:

CRU008

AUCKLAND DISTRICT HEALTH BOARD

Clinical Alert Notification / Cancellation

ARN1608

MUST ATTACH PATIENT LABEL HERE

☑ Alert Notification **or** ☐ Alert Cancellation

CLINICAL ALERT DETAILS

All relevant sections must be completed in full for Notification/Cancellation to be actioned.

DRUG REACTION:

Agent: Pheroxymethyl penicillin

Effect: anaphylaxis.

INFECTION CONTROL:

- ☐ MRO positive-single room – Contact Precautions
- ☐ MRO-ESBL positive-single room – Contact Precautions
- ☐ MRO-VRE positive-single room – Contact Precautions
- ☐ MRSA positive-single room – Contact Precautions

Comments / Specify:

OTHER:

- ☐ ACC Treatment Injury
- ☐ Advanced Care Planning
- ☐ Anaesthetic Alert
- ☐ Bleeding Disorder
- ☐ Blood / Transfusion Alert
- ☐ Child Protection*
- ☐ Child Protection* - HCC
- ☐ CJD Iatrogenic Exposure
- ☐ Clinical Trial*
- ☐ ED Manageme
- ☐ Falls Risk
- ☐ Family Violenc
- ☐ Family Violence* - HCC
- ☐ Haemophilia
- ☐ Immunodeficiency
- ☐ Important Document Alert
- ☐ Palliative Care
- ☐ Patient's Birth Gender is Female
- ☐ Patient's Birth Gender is Male
- ☐ Release of Information Alert
- ☐ Security Alert (level ____)*

Comments / Specify:

* See reverse for further details

☑ Alert Discovered by: **or** ☐ Alert Cancelled by:

Service: ORL - on admission Print Name: _____ Signature: _____

Designation: _____ Date: _____

Clinical Alert Approval Section

This section must be completed in full by a Senior Clinician i.e. Consultant, Registrar, Nurse in Charge or Pharmacist

Alert Notification / Cancellation ☑ **approved by** ☐ **not approved (see reason below):**

Print Name: _____ Signature: _____ Designation: _____ Date: 8/1/13

Non-Approval Reason: _____

1. **FAX IMMEDIATELY TO THE CLINICAL RECORD DEPARTMENT - 22279** ☑ **DONE**
2. **FILE FORM IN PATIENT NOTES** Already On.

Clinical Records staff to tick when completed

☐ CMS Updated Clerk Name: _____ Date: 15.1.2014

CLINICAL ALERT/ION/CANCELLATION

CR0008

PAGE 1

08/13

CLINICAL ALERT DETAILS

All relevant sections must be completed in full for Notification/Cancellation to be actioned.

DRUG REACTION:

Agent: Pheroxymethyl penicillin

Effect: anaphylaxis.

ARN1608 [redacted] Clinical Alert

Patient Summary 12:09 10/9

Rticehurst
Help Home
Logout

Patient Searches
Recent Patients
Patient Search
Current Inpatient / ED Search
Outpatient Search
Clinical Viewer Search
Worklists
Applications
Document Completion
Settings
Shared Care
Messaging

Showing all documents

View By Date Look For Clear

Date	Title	Author
Dynamic Patient Summary		
User Home Page		
Last 12 Months (2)		
All Previous (7)		

ADHB Patient View

Patient Demographics

Patient:	ARN1608 - [redacted]
Gender:	Female
Date of Birth:	[redacted]
Age:	
Home Address:	
Phone Number:	
Mobile Number:	
Spoken Language:	
Religion:	
Ethnicity:	New Zealand European
Email Address:	[redacted]

Minor NHI Numbers

None.

Patient Contacts

Name	Relationship	Address	Phone
[redacted]	Health Practitioner	[redacted]	649-521 1120
	Spouse		
[redacted]	Mother		5758470

Patient Alias

Alias
[redacted]

Shared Care Record

There is no shared care record available for this patient

Alerts and Allergies

Alert/Allergy Name
Drug Reaction

Severity	Onset Date	Alert
Warning	09/01/2014	Drug reaction: contact ADHB Clinical Rec on 3074949 ext.22288

There has to be a better way…….

- Paper forms are laborious
- Doctors handwriting is difficult to read
- A lot of effort for very little gain from a patient safety perspective
- No electronic decision support potential
- No real incentive for the clinician to report (WIIFM)
- No driver for software vendors if we don't have structured data

What's needed?

- Patient details
  - Based on National Health Identifier (NHI)
- Drug / drug class (NZULM & NZF)
- Reaction(s) (SNOMED CT Australian extension – Clinical Manifestation)
- Severity (SNOMED CT Severities – 7 options)
- Date of reaction
- Freetext comments field
- Reporter details
  - Based on Health Practitioner Index (HPI)
- Report date

Debatable value

- Certainty (SNOMED CT Certainty of Diagnosis)
- Avoid in future? (yes/no)

What about historical data?

'It's full of junk'

ADHB Patient Administration System (CMS)

- 1574 living patients with drug-related CR0008 on file
- Manual review of all forms
  - Coded with NZULM/NZF for drug terms
  - Aussie Refset (745 terms) for drug reactions
- Completed over 900 reviews
  - No significant issues with coding so far

National Medical Warning System

Established 40 years ago

First report in 1978 – allergic reaction to aspirin

Contains almost 750,000 alerts reported over that time period (living and dead)

Auckland DHB cohort from NMWS:

- 482,000 patients (2015/16 estimate)
- 35,966 warnings (not all drug related)
  - 24,075 warnings for living patients
  - ADHB reported = 863 living patients with drug reactions

Reviewed random sample 150 drug reactions in NMWS (non-ADHB reported)

- NZULM/NZF substance and allergy classes
- CSIRO SHRIMP refset viewer
  - great synonym search

ALL 150 could be accurately coded (<45 minutes)

Centre for Adverse Reaction Monitoring

New Zealand has had the highest rate of reporting adverse reactions to medicines per population in the world for at least the last two decades

- Medical Warnings - entered for medicines that have caused serious or potentially serious allergic reactions or other reactions likely to lead to serious illness or distress if re-administered
- Medical Dangers - entered for medicines that are likely to cause life-threatening or fatal reactions if re-administered

All included in the NMWS

All CARM added alerts are reviewed by a medical assessor (vs automated from most DHBs)

Recoding effort

NZ population = 4.5 million

20 District Health Boards covering the 4.5 million

Auckland DHB – catchment of 500,000 patients

CARM added records for ADHB catchment

1875 Warnings

529 Dangers

Scaled up for population

≈17,000 Warnings (283 hours)

≈ 4700 Dangers (78 hours)

Two people could complete this task in one month

Rob's vision

- National repository of coded allergy & ADR detail
- Standardised national web-based reporting form
- Any electronic system recording or editing allergies & ADRs utilises/ interfaces with National form
- Any electronic system using allergy/ADR clinical decision support interfaces with National repository for patient details

- Don’t let the great get in the way of the good – Voltaire, France, 1770
- Work smarter not harder -Allan F. Mogensen, USA, 1930
- NZ, stop talking and start doing – Rob Ticehurst, NZ, 2016

Acknowledgements

- Northern Region Allergy and ADR review group
- Anne Goodwin (MoH)
- Janelle Ashton (CARM)
- Liz Fagan (ADHB Pharmacy)