# Common Drug Codes for India (CDCI)

**Achyut Patil**

National Resource Centre for EHR Standards (NRCeS)

C-DAC Pune

# Outline

- Impetus
- Availability for Use
- Scope of CDCI
- Tools Used
- Current Release
- Challenges

# Impetus

- Cater to national needs of coding medications in EHR
  - Allow/ban certain drugs, use of generic name, use of certain brands, etc.
- Able to communicate drug-related information efficiently and unambiguously.
- Enable linkages to terminology and use in application/system for Clinical Documentation
  - Data Retrieval
  - Data Analytics
  - Reporting
  - ePrescription
  - Stock management
  - Supply Change management

# Availability for Use

- The Common Drug Codes for India are distributed in two different formats for ease of use and adoption:
  - Common Drug Codes for India (Terminology Integrated Package)
    - As Extension to SNOMED CT
    - Through MLDS to registered Affiliates
  - Common Drug Codes for India (Flat Files Package)
    - Enables integration of drug codes without need of integrating the complete Terminology
    - Tab Separated Values in text files

# Scope of CDCI

- Include generic, supplier, and branded medicines covering all medicines, except devices, surgical implants, and combination packs, from National Programs:
  - National List of Essential Medicines (NLEM) 2015
  - Pradhan Mantri Jan-Aushadhi Yojana
  - Affordable Medicines and Reliable Implants for Treatment (AMRIT)
- Referenced with July 2020 SNOMED CT International Edition release
- Release included CDs, RCDs, RMPs only.
- *PCD* and *RPCD* concepts NOT included (future scope)

- Model based on
  - *SNOMED International Medicinal Product Hierarchy - Editorial Guidelines*
  - *SNOMED CT Drug Model for supporting National Extension v1.0*.

# Tools Used

- Drug Information Repository (DIR)
  - Single page web application to support curation of Medicine and Generic
  - Follows two step review process with various roles include User, Reviewer, and Staff
  - The curated output of DIR (will be) fed to the authoring platform
- Terminology release validation and packaging services from Authoring Platform Service Stack provided by SNOMED International
  - RVF, Classifier Service
- Scripts to generate Flat Files Package from Terminology Integrated Package

# Current Release

- First BETA release of India Drug Extension for SNOMED CT was on January 2018 which included around 1000 medicines/ clinical drug concepts for tablets and capsules with oral dose form
- Developer Preview released on **November 22, 2019**
- **Production release on August 28, 2020**
- Containing additional concepts covering Suppliers, Brand and Supplier combination, Clinical Drug, and Branded Medicines
- Offers total Generic **6936** and **14948** Branded Medicines

| Concept Type | Count |
|---|---|
| Supplier (Manufacturer) | 1918 |
| Product Name (trade or brand name) | 16061 |
| Clinical drug (Generic Medicine) | 598 |
| Real Clinical Drug (Branded Medicine) | 14948 |

# Challenges

- Missing Dose Form
- Strength Conversion
- Inconsistency in BoSS and Precise Active Ingredient attribute
- Unstable model
- Content Request

# Missing Dose Form

- **Requirement:**

  Azithromycin 500 mg film-coated tablet

  Atorvastatin 20 mg prolonged-release film-coated oral tablet

- As per **SNOMED CT Medicinal Product Model Specification v1.0**,

  Attribute “Has manufactured dose form” should have Descendants of 736542009|Pharmaceutical dose form **(dose form)**

- 385057009 | Film-coated tablet **(basic dose form)** | is not descendent of Pharmaceutical dose form
- Unlike 385053008 | Prolonged-release oral capsule (dose form) | and 420692007 | Conventional release oral capsule (dose form) |, both belongs to Pharmaceutical dose form

# Strength conversion - I

- **Requirement:** Most of the branded medicines defined using presentation strengths

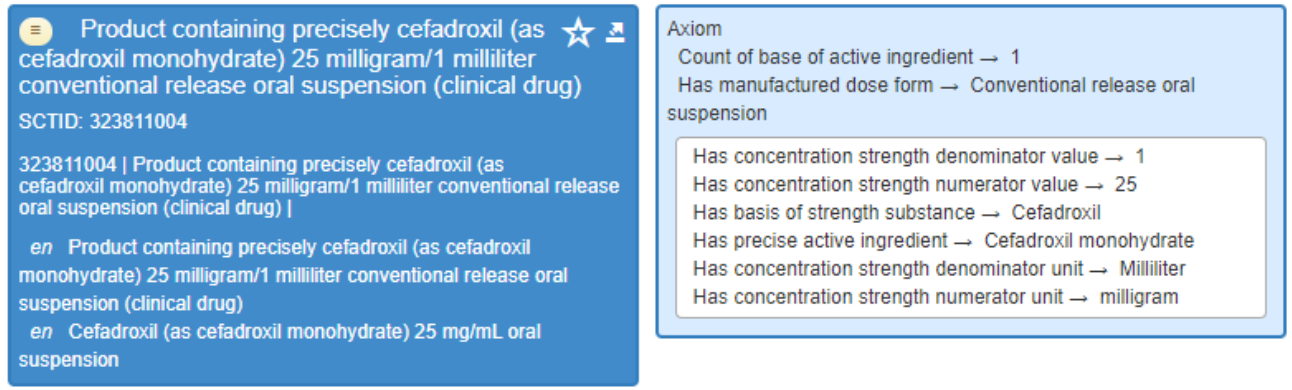
  E.g., Cefadroxil 125 mg/5 mL oral suspension

- International release covers CD with concentration strengths

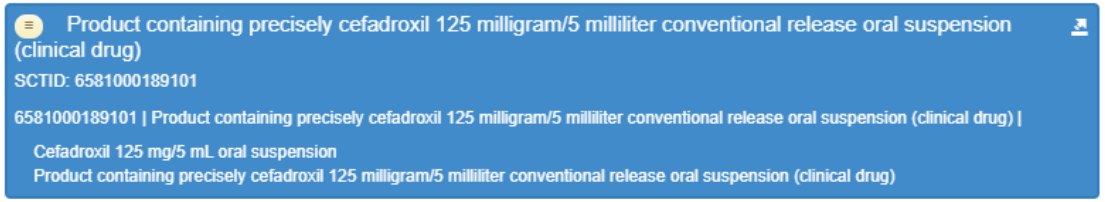
  E.g. 100mg/ml, 5mg/ml, 2mg/ml, 1mg/ml, 5mg/g)

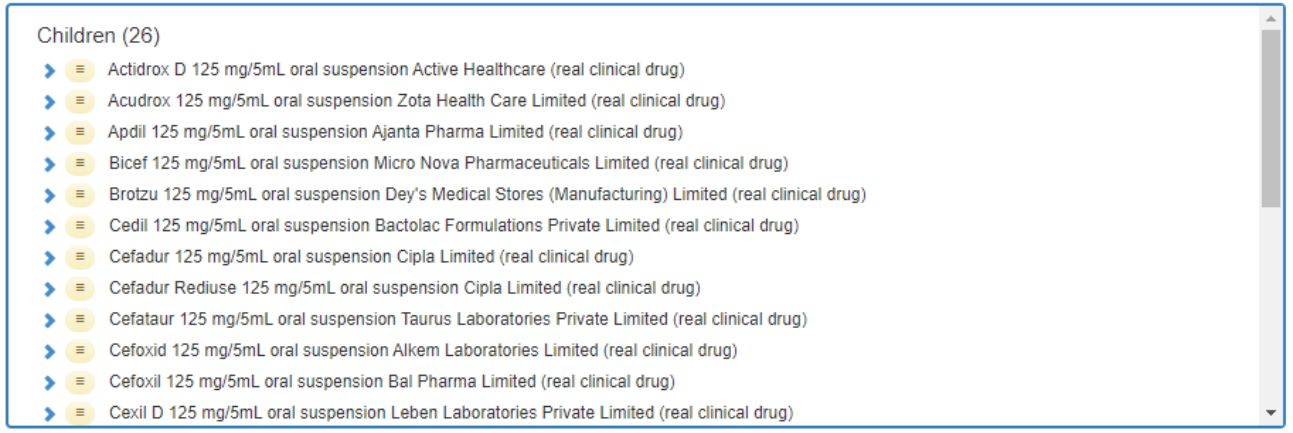
- A clarity is needed if the modelled branded medicines in the extension also always require a CD to be modelled for presentation strengths

SNOMED International CD



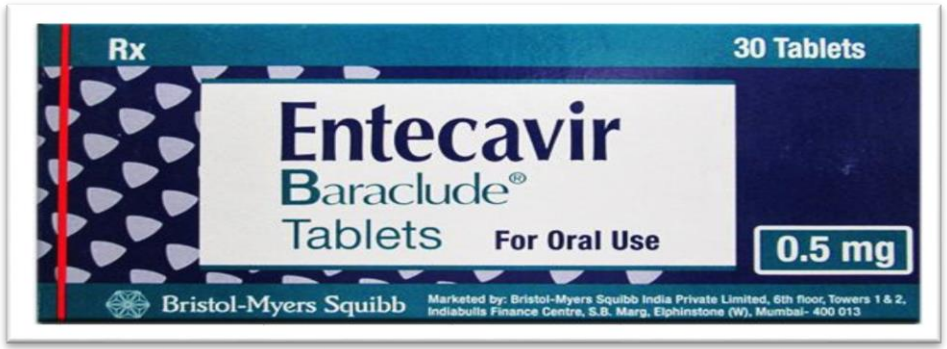

Extension CD



# Strength conversion - II

- **Requirement**: Available branded medicines for extension is
  - Barclude entecavir 0.5 mg tablet
- As per SCT General Terming and modeling guide - product strength for metric units to be normalized like
  - Use milligram if value is <1000; if > then convert to gram
  - Use microgram if value is <1000; if > then convert to milligram
  - Use nanogram if value is <1000; if > then convert to microgram
  - Use picogram if value is <1000; if if > then convert to nanogram
- Very difficult for doctors to search and choose
- Such conversions and modeling requirements would become barrier for adoption
- Can *Barclude 0.5 mg oral tablet* be a preferred term is such cases?




Product containing precisely entecavir 500 microgram/1 each conventional release oral tablet (clinical drug)

SCTID: 417515001

417515001 | Product containing precisely entecavir 500 microgram/1 each conventional release oral tablet (clinical drug) |

Entecavir 500 microgram oral tablet

Product containing precisely entecavir 500 microgram/1 each conventional release oral tablet (clinical drug)

Children (2)

- Baraclude 500 mcg oral tablet Bms India Private Limited (real clinical drug)
- Entehep 500 mcg oral tablet Zydus Cadila Healthcare Limited (real clinical drug)

# Strength conversion - III

- **Requirement:**

  Available branded medicines have strengths in %, % w/w , % w/v , % v/v etc.

  E.g., Fusidic Acid Cream 2% w/w

  Barium sulphate oral liquid 100% w/v

- In SNOMED CT, strength expressed as mg/g, mg/mL etc.

Product containing precisely fusidic acid 20 milligram/1 gram conventional release cutaneous cream (clinical drug)

SCTID: 332825002

332825002 | Product containing precisely fusidic acid 20 milligram/1 gram conventional release cutaneous cream (clinical drug) |

Fusidic acid 20 mg/g cutaneous cream

Product containing precisely fusidic acid 20 milligram/1 gram conventional release cutaneous cream (clinical drug)

Children (5)

- Fucibet 20 mg/1g cutaneous cream Ranbaxy Laboratories Limited (real clinical drug)
- Fucidin 20 mg/1g cutaneous cream Ranbaxy Laboratories Limited (real clinical drug)
- Fusibact 20 mg/1g cutaneous cream East West Pharmaceuticals Private Limited (real clinical drug)
- Fusital 20 mg/1g cutaneous cream Talent Healthcare (real clinical drug)
- Sofinox 20 mg/1g cutaneous cream Apex Laboratories Private Limited (real clinical drug)

# Inconsistency in BoSS and Precise Active Ingredient

- Inconsistency in modelling

**For same strength**

Product containing precisely ciprofloxacin (as ciprofloxacin hydrochloride) 500 milligram/1 each conventional release oral tablet (clinical drug)

SCTID: 783330006

783330006 | Product containing precisely ciprofloxacin (as ciprofloxacin hydrochloride) 500 milligram/1 each conventional release oral tablet (clinical drug) |

Ciprofloxacin (as ciprofloxacin hydrochloride) 500 mg oral tablet

Product containing precisely ciprofloxacin (as ciprofloxacin hydrochloride) 500 milligram/1 each conventional release oral tablet (clinical drug)

**BoSS ≠ Active ingredient**

Product containing precisely ciprofloxacin hydrochloride 500 milligram/1 each conventional release oral tablet (clinical drug)

SCTID: 374580006

374580006 | Product containing precisely ciprofloxacin hydrochloride 500 milligram/1 each conventional release oral tablet (clinical drug) |

Ciprofloxacin hydrochloride 500 mg oral tablet

Product containing precisely ciprofloxacin hydrochloride 500 milligram/1 each conventional release oral tablet (clinical drug)

**BoSS = Active ingredient**

**For different strength**

Product containing precisely cefotaxime (as cefotaxime sodium) 20 milligram/1 milliliter conventional release solution for injection (clinical drug)

SCTID: 784783008

784783008 | Product containing precisely cefotaxime (as cefotaxime sodium) 20 milligram/1 milliliter conventional release solution for injection (clinical drug) |

Cefotaxime (as cefotaxime sodium) 20 mg/mL solution for injection

Product containing precisely cefotaxime (as cefotaxime sodium) 20 milligram/1 milliliter conventional release solution for injection (clinical drug)

**BoSS ≠ Active ingredient**

Product containing precisely cefotaxime sodium 40 milligram/1 milliliter conventional release solution for injection (clinical drug)

SCTID: 785115008

785115008 | Product containing precisely cefotaxime sodium 40 milligram/1 milliliter conventional release solution for injection (clinical drug) |

Cefotaxime sodium 40 mg/mL solution for injection

Product containing precisely cefotaxime sodium 40 milligram/1 milliliter conventional release solution for injection (clinical drug)

**BoSS = Active ingredient**

# Inconsistency in BoSS and Precise Active Ingredient

- Difficult to identify clinical drug and model related branded medicine
- **Question:**
  - How to identify the Basis of Strength Substance?
  - Is there any technical way/rule in modelling?

- **Observation:**
  - **In SNOMED CT,** Base ingredient substances can be identified from their modifications (substance) through the relation 738774007|Is modification of (attribute)


  - **Is this a ways to define BoSS and Precise Active Ingredient substance in clinical drugs**
- Clear guidelines with examples is needed in modelling guide

# Unstable model

- The product hierarchy is continuously evolving and covering the different use cases.
- Change log of **Medicinal Product Hierarchy** model in last 3 years
  - Update in presentation and concentration strengths
  - Attribute description changes - |Has manufactured dose form|
  - Update related to |Has basis of strength substance|
  - Update in CDs FSN

    "Product containing" to "Product containing only" to "Product containing precisely"
- It has been a challenge to keep up to the international version

# Content Request

- So far, CDCI has
  - Clinical drug (Generic Medicine) : 598
  - Real Clinical Drug (Branded Medicine) : 14948
- SNOMED International also parallelly adding new clinical drugs, this makes few duplicate modelling of clinical drugs.
- SNOMED International accepting content request 2 months prior to bi-annual release.
- Wait time for inclusion of content is minimum 6-7 months
- This delays the availability of branded medicine in the extension release by 8 months
- The content request window for Drug and substance concepts may be extended until the hierarchy gets stable
- Some way of collaboration between member countries to avoid duplicates and rework may be devised


# Thank You

nrc-help@cdac.in