SNOMED CT Cardiology Reference Set Development, Malaysia

SNOMED CT Conference
Amsterdam, The Netherlands
30-31 October 2014
Content

- developmental process of the first SNOMED CT Reference Set (refset) development using the National Cardiovascular Disease (NCVD) Registry;
- establish methodology to be replicated in future refset;
- evaluation of tools;
- Implementation strategy & stakeholders involvement for early buy-in and early deliverables;
- MyHDW as a way forward
Malaysian Health Data Warehouse (MyHDW)
A Way Forward
MyHDW: Definition and Characteristics

A trusted source of truth of comprehensive healthcare data structured for query and analysis

- Optimized for analysis and reporting *
- Integrated, interoperable and comprehensive health data *
- Build based on national health informatics standards
- Overarching healthcare system governance
- Information available in ‘right time’
- ‘Build once use many’
- Support many reporting and analysis tools and interfaces
- Highest level of data quality through appropriate methods, tools and techniques
- Implements secure and privacy sensitive access
- Focus on Secondary Usage of health data
MyHDW: Category of Use & Data Sources

MyHDW Consumer

Health System Managers
Health System Researchers
Surveillance
Clinical Program Managers

Malaysia Health Data Warehouse (My HDW)

MyHDW Data Sources

HIS & SPP
TPC
OHCIS
LHR
KZM
FOSIM
FEXOC
Globinmed
FEXCIS
eNotice
CaseMix
HIMS
ePengamal
Quest3
Fomema
MedPCs
QAP
Disease Registries
Facility
SPA
Aset
CMIS
APC
SNOMED CT in MyHDW: SNOMED

Malaysian Health Data Warehouse (MyHDW)

Mi-Harmony (Mapping & Coding)

SNOMED CT coded database

Uncoded database

MyHDW Data Sources
Mi-Harmony Usage Model

Existing HIS
- HIS
- TPC
- OHCI

MIMOS Systems
- LHR/MyHIX
- Patient/Disease Registries
- SPP
- SMRP
- SIMKA

SNOMED CT Coding Phase
- Codification Engine
  - SNOMED-CT Coded Databases

Mapping Engine
- Un-coded Databases

Data Aggregation
- MALAYSIA HEALTH DATA WAREHOUSE (MyHDW)
- RefSets Server

ETL

Data Consolidation
- Cube Generation
Mi-Harmony System Architecture

1. Reference Sets
   - RefSet Authoring tool

2. DB Schema
   - Reverse Engineering (RE)

3. EHR sampled Database
   - Mapping tables
     - Mapping
     - SNOMED Codification
     - SNOMED-CT Coded Data
SNOMED CT Cardiology Reference Set
The Development
Strategy: Lessons Learnt

Intention
- MyHDW
- BDA

Team Player
- NRC Malaysia
- ICT Experts
- Domain experts
  - Cardiology

Scope
- Deliverable
- Early Result
- Buy-in
Tool Review:

- Tool review
  - 10 Browsers & Authoring tools
  - Factors: long-term financial implication, cost for human resource development, functions
- Tool decision: IHTSDO Workbench
First Workshop:

- Tripartite arrangement: Clinical domain experts, MIMOS, HIC + IHTSDO
- 2 sessions of 3-day workshops
- First session: Understanding SNOMED CT, potential benefits, video session and plan formulation by Domain experts
- Second session: Develop initial refset - online browsers

Immediate Term Goal

Getting ACS and PCI registries coded with SNOMED CT
Lessons Learnt 1

- Presented Cardiology Refset’s first draft to IHTSDO representatives over online discussion

Lessons learnt:
- Information Model: understanding it and its requirement; and
- Too early in tripartite arrangement – not cost effective to the clinicians

Moving forward:
- Learned about Information Model of the registry
- Learned more about SNOMED CT Concept Model
- Revision of Cardiology Refset by NRC Malaysia and MIMOS
- Approach Domain experts when clarification of clinical terms in registry/actual meaning/workflow needed
Lesson Learnt 2

- Presented Cardiology Refset’s revised draft during SNOMED CT Conference 2013

- Lessons Learnt
  - Application of logical model in the refset development
  - Approaches to postcoordination

- Designed method of developing and endorsing a refset
The Methodology

1. Information Model
- Decipher NCVD registry form
- Arrange the terms in registry into proper clinical terminology

2. Present to domain expert
- Matching SNOMED CT concepts:
  - Clinical meaning to the terms in registry and in SNOMED CT
  - Clear any reservations
- Used IHTSDO Workbench

3. Consensus & Endorsement
- Concensus among domain experts
- Endorsed by Head of Cardiology Malaysia
**SECTION 2 : STATUS BEFORE EVENT**

1. Smoking Status: 
   - Never
   - Former (quit >30 days)
   - Current (any tobacco use within last 30 days)

2. Status of Aspirin Use: 
   - None
   - Used less than 7 days previously
   - Used more than or equal to 7 days previously

3. Premorbid or past medical history:
   - Dyslipidaemia
     - Yes
     - No
     - Not known
   - Hypertension
     - Yes
     - No
     - Not known
   - Diabetes
     - Yes
     - No
     - Not known
   - Family history of premature cardiovascular disease
     - Yes
     - No
     - Not known
   - Myocardial infarction history
     - Yes
     - No
     - Not known
   - Documented CAD > 50% stenosis
     - Yes
     - No
     - Not known
   - Chronic Angina (onset more than 2 weeks ago)
     - Yes
     - No
     - Not known
   - New onset angina (Less than 2 weeks)
     - Yes
     - No
     - Not known
   - Heart failure
     - Yes
     - No
     - Not known
   - Chronic lung disease
     - Yes
     - No
     - Not known
   - Renal disease
     - Yes
     - No
     - Not known
   - Cerebrovascular disease
     - Yes
     - No
     - Not known
   - Peripheral vascular disease
     - Yes
     - No
     - Not known
   - None of the above

**SECTION 3 : ONSET**

1a. Date of onset of ACS symptoms:
   - d d m m y y

1b. Time of onset of ACS symptoms:
   - h h m (24hr) Not available

2a. Date Patient presented:
   - d d m m y y

2b. Time Patient presented:
   - h h m (24hr) Not available

3. Was patient transferred from another centre?
   - Yes
   - No
NCVD PCI
Section 7: PCI Procedure Details (No 6)

(PCI S7 no 6) Lesion description

<table>
<thead>
<tr>
<th>Lesion Description</th>
<th>FINDING OF LESION</th>
</tr>
</thead>
<tbody>
<tr>
<td>(PCI S7 no 6) Lesion description: ostial CORONARY OSTIUM STENOSIS</td>
<td>(PCI S7 no 6) Medina Classification Finding</td>
</tr>
<tr>
<td>(PCI S7 no 6) Lesion description: bifurcation BIFURCATION LESION OF CORONARY ARTERY</td>
<td>(PCI S7 no 6) Medina Classification Finding: Main Branch proximal 0</td>
</tr>
<tr>
<td>(PCI S7 no 6) Lesion description: Total occlusion &lt;3mo TOTAL; CORONARY OCCLUSION</td>
<td>(PCI S7 no 6) Medina Classification Finding: Main Branch proximal 1</td>
</tr>
<tr>
<td>(PCI S7 no 6) Lesion description: CTO &gt;3mo CHRONIC; TOTAL; CORONARY OCCLUSION</td>
<td>*MEDINA CLASSIFICATION FINDING: MAIN BRANCH PROXIMAL 0</td>
</tr>
<tr>
<td>(PCI S7 no 6) Lesion description: thrombus CORONARY ARTERY THROMBUS</td>
<td>*MEDINA CLASSIFICATION FINDING: MAIN BRANCH PROXIMAL 1</td>
</tr>
<tr>
<td>(PCI S7 no 6) Lesion description: calcified CALCIFICATION OF CORONARY ARTERY</td>
<td>(PCI S7 no 6) Medina Classification Finding: Main Branch distal 0</td>
</tr>
<tr>
<td>(PCI S7 no 6) Lesion description: LMS LEFT MAIN CORONARY ARTERY DISEASE</td>
<td>(PCI S7 no 6) Medina Classification Finding: Main Branch distal 1</td>
</tr>
<tr>
<td></td>
<td>*MEDINA CLASSIFICATION FINDING: MAIN BRANCH DISTAL 0</td>
</tr>
<tr>
<td></td>
<td>*MEDINA CLASSIFICATION FINDING: MAIN BRANCH DISTAL 1</td>
</tr>
<tr>
<td></td>
<td>(PCI S7 no 6) Medina Classification Finding: Side Branch 0</td>
</tr>
<tr>
<td></td>
<td>*MEDINA CLASSIFICATION FINDING: SIDE BRANCH 0</td>
</tr>
<tr>
<td></td>
<td>(PCI S7 no 6) Medina Classification Finding: Side Branch 1</td>
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</tbody>
</table>
Finalized Method

- Method and Refset presented to members of IHTSDO during Business Meeting April 2014
- Method was acknowledged by IHTSDO
- Next:
  - Future refsets: Oncology, SMRP (HIMS)
  - Mi-Harmony
- Concurrent work:
  - Harmonizing activity for SNOMED CT with MyHDW, LOINC, ICD, MyHDD
  - Collaboration with University Malaya - implementation at user-interface level
Take Home Message

- SNOMED CT is aligned with ministry or national initiative
- NRC sets overarching strategy: Early result, maintain buy-in;
- Stakeholder engagement: Who, When, How;
- Domain experts own goal motivates and maintain buy-in;
- Continuous skill development in SNOMED CT;
- Team work: tripartite arrangement;
- Method: Information model → Present & Clarify → Endorse;
- Start small, validate, replicate, expand;
- Start right the first time.
BDA IMPLEMENTATION MANDATE

"...the Communications and Multimedia Ministry with the support of the Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) and MDeC will jointly implement four government initiated Big Data Analytics (BDA) pilot projects by 2015 to drive ICT services."

Prime Minister Datuk Seri Najib Tun Razak
The 25th MSC Malaysia Implementation Council Meeting
14 November 2013

25th MSC Malaysia Implementation Council Meeting (ICM)
14 November 2013

1. To develop the Big Data Framework for Malaysia
2. To implement 4 Government-initiated BDA pilot projects
Thank you
from NRC Malaysia

30th October 2014
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NRC Malaysia