

Canadian Experience Implementing SNOMED CT for Microbiology Lab Results



Agenda

- Overview of the Canadian NRC & the requestor
- Approach
- Benefits
- Challenges & pragmatic solutions
- Lessons learned

Background & Context

Canada Health Infoway

- Small team and use excel for Requests for Change (RFC)

The Requestor & Canadian Domain

- Jurisdictional requestor represents an initiative with a live system being used to connect all laboratories and practitioners to facilitate the electronic exchange of lab orders and results.
- The jurisdictional repository contained:
 - Lab results for >9 million patients (70% of the population)
 - Laboratory data includes >900,000 test results
- Uses LOINC for result observation
- Had an existing microorganism list of 3,900 concepts. Some issues included:
 - Flat list
 - Spelling mistakes & duplicate concepts
 - Significant maintenance effort
- There is no standardized Microbiology reporting format in Canada

Approach

Infoway

- Met with the jurisdiction to discuss their needs
- Provided education to the jurisdictional team
- Reached out to Kent to confirm status of related content project
- Met weekly with requestor to discuss questions and collaboratively make decisions

Requestor

- Decision point – go no go with SNOMED CT (just before Christmas).
Requestor plan:
 - Current implementers would continue to use the existing codes & descriptions in their interface with the repository
 - new implementers would map microorganism related values to SNOMED CT & use the FSN in messaging
 - map existing concepts to SNOMED CT
 - Needed fast turnaround to meet windows of opportunity with new implementers.

Summary of Requests

- Received >1600 requests to add concepts over 9 months
 - Received them in batches as needed by implementer (without any grouping)
 - Unable to see the patterns
- Managed by 2 resources (not full time)
- Started with microorganism specific RFCs, but requestor soon saw the benefit of including microorganism-related values such as “Salmonella species not Salmonella typhi (finding)”.
 - This increased the volume of RFCs
- Estimated time spent per RFC was approximately 30 min

Benefits

- SNOMED-CT is both a pan-Canadian and an International Standard
 - 2 other provinces are now planning to use SNOMED CT for microorganisms
- Allows greater expression than existing nomenclature
 - it contains a much larger number of concepts (which minimized free-text) and
 - varying hierarchical levels support the needs of clinical use (e.g. high-level observations such as “Gram –positive diplococcus” to very specific such as “Neisseria meningitidis serogroup B”)
- Can be implemented without any programming changes in existing jurisdictional repository or for labs
 - Phased approach meant new labs can map to SNOMED CT at the outset while existing labs can migrate as time and resources permit
- Reduced maintenance effort
 - Ongoing maintenance of SNOMED CT microorganism concepts is handled by standards development organizations (IHTSDO and Infoway)

Benefits cont'd

- Jurisdictional team and Infoway learned a lot about SNOMED CT
- Existing issues with duplicates, spelling mistakes should be minimized
- Guidelines are now in place for consistent representation of content
- Will enable Health System Use e.g. public health surveillance
- More clarity of micro-related values
 - particularly for uncommonly used values such as 'Escherichia coli O rough:H45 (organism)'

Challenges

- Getting the RFCs in small batches contributed to inconsistency. If we received the RFCs all at once it would have enabled us to find patterns and develop better editorial guidelines and improve consistency.
- If there is an open project at IHTSDO, it is difficult to get recommendations/decisions, and things changed.
- It was really hard to know what was the source of truth for making decisions. There is conflicting information.

Micro Specific Challenges

- It is not always clear if a concept should be in organism hierarchy, or finding, or situation
- For concepts with the modifier 'like', should FSN be X like bacteria, X like virus, or X-like organism? Should they be in the organism hierarchy?

Enterovirus-like organism (finding)

Norovirus -like virus (organism)

Micro Specific Challenges (2)

- The use of plural form in FSN was confusing for requestor.
 - Organisms should be singular
 - Findings can be plural

Plural examples	Singular examples
Mixed anaerobic Gram negative bacilli (finding)	Anaerobic gram variable bacillus (organism)
Mixed anaerobic Gram positive cocci (finding)	Beta hemolytic Streptococcus non-Group A (organism)

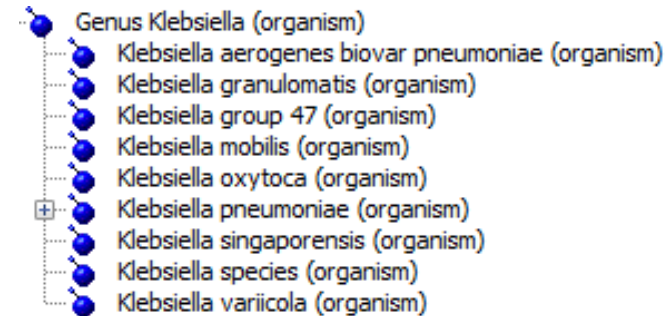
- The use of dashes between words is inconsistent in SNOMED CT, e.g.:
 - Between gram and positive
 - Between beta and lactamase
 - Between beta and hemolytic

Micro Specific Challenges (3)

- When to use commas in the description; e.g. Beta hemolytic Streptococcus non-Group A or Beta hemolytic Streptococcus, non-Group A?
- Negative and “presumptive” concepts, e.g.:
 - No Blastocystis hominis
 - No Cyclospora species
 - Presumptive Microsporidium species
 - Aerobic gram positive spore-forming bacillus, not Bacillus anthracis
 - Should these be findings or situations?

Micro Specific Challenges (4)

- X species:
 - E.g.:
 - Klebsiella species
 - Borrelia species
 - Rhinovirus species
 - There are several problems with these, e.g.:
 - They fall under Genus and become siblings to other species of the same Genus
 - What it really means is that the lab has found an organism and is down to the level of Genus but is not sure which species it belongs to
 - These will be modeled as:
 - Genus Salmonella (observation result)
 - Salmonella species unspecified (observation result)
 - Salmonella choleraesuis (observation result)
 - Etc.
 - Since observation result has not been added as a semantic tag yet, we created them as finding for now, e.g.:
 - Klebsiella species unspecified (finding)



Lessons Learned

- Expectations from requestors needs to be managed (process takes quite a bit of time). There was a gap in expectations with what could be delivered.
- Working with domain experts proved to be extremely important. We had 2 micro experts on the team and were in contact with other experts in the country and outside.
 - It would have been good to work directly with referral labs

Lessons Learned (2)

- When the requestor and the NRC communicate and collaboratively work out the best solution on the tough RFCs, the result is a satisfied requestor who has now learned a lot about SNOMED CT, how to use it, and ultimately a better product. This could apply to the interaction between NRCs and the IHTSDO
 - We decided to consider everything that was sent to the requestor, a beta-release, for a short period of time. This provided the requestor with an opportunity to confirm everything where there was a slight change.
 - Weekly meetings with the requestor worked very well

Lessons Learned (3)

- It is important to keep track of all the communication (within the team, with the requestor, and with external experts) regarding RFCs.
 - We added new columns /properties to our Excel sheets to help manage information, e.g.:
 - the requestor's internal id (to facilitate monitoring of the request)
 - A field to capture questions and answers from external experts
 - "Status" of the requests
 - Important to clearly define all columns and properties to ensure they are used consistently

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Thank you