SNOMED CT in Practice

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Agenda

This presentation will draw on real life experience of how using SNOMED CT has impacted the Rotherham NHS Foundation Trust, offering insight on the processes and challenges as well as sharing lessons learned for wider service implications and ‘top tips’ to accurately predict and overcome challenges.

The NHS information technology (digital) strategic landscape has shifted:

- The focus in digital planning has shifted from trusts to the local health community, Sustainability and Transformation Partnerships (STPs) leading to **Integrated Care Systems (ICS)**
- The national agenda has changed from technology to 'digitisation'
- The Wachter Report to NHS England endorsed this and led to 12 Trusts being appointed 'Global Digitisation Champions' attracting matched funding up to £10m
- Trust-based systems are still critical in driving a paper-lite NHS agenda for the 2020's
- There is an increased awareness of CyberSecurity threats to the NHS

Over the past 10 years the Trust has implemented and developed core mission-critical patient systems around Meditech (Acute) and SystmOne (Community). **TRFT has implemented SNOMED CT.**

The Trust has also developed a successful Rotherham-wide information sharing system in the **Rotherham Health Record.** There is now an NHS England Programme for Local Health Care Record Exemplars (LHCREs) building on best practice for System Interoperability.

The vision for Informatics is to be 'digital by default' and be a lead in providing integrated digital services for the Trust, supporting integrated care in the local health community and beyond.

Why SNOMED CT?

- Global scope – contribution, utility
- Wide range of disciplines and specialties
- Ever growing and improving
- Meaning representation means multiple purposes
- Breadth of functionality supported
- Mandatory as NHS Information Standard (in England). Implementation:
  - Primary Care from 2018
  - Secondary Care from 2020

What SNOMED CT is ...

- Computer based file/s
- A coding system (uses codes)
- A clinical health terminology
  - Reference terminology
  - Interface terminology
- Resource - comprehensive scientifically validated content
- It is multiaxial and can be used to classify things (though not designed to incorporate 'not otherwise classified')
- Is essential for computable meaning in healthcare records and systems
- Can be mapped to and from other coding classifications
- Used in more than 50 countries
- Can be extended locally
- It is comprehensive, extensive ... and growing

SNOMED CT is also ...

- A classification
  - a multi-axial classification but it does not have the characteristics of a statistical classification (which is what we usually mean in healthcare when we refer to a classification) , in that it does not have ‘other’ and ‘not otherwise specified’ buckets.
- A reference terminology
  - with reference features which are supported by retrieval mechanisms inherent in the logical based structure of the terminology
- An interface terminology
  - supporting human interface through synonyms, reference sets, navigation hierarchies and search support resources
- Change to clinical coding
  - isn't going to replace the coding jobs but will change some areas of coding, movement towards assurance role and does offer an additional career pathway

SNOMED CT vs ICD Functionality

Characteristic	ICD-10	SNOMED CT
Supplementary concepts, such as: Not elsewhere classified	Yes	No
Representation of 'catch all' codes such as: Other	Yes	No – less ambiguous
Represent more than one concept with a single code	Yes – in some cases	No – more accurate
All inclusive – a place to represent anything in the area for which the classification or terminology is used	Yes – but only as 'not otherwise specified'	No – but able to be extended
Computable logical ontological structure and relationships. The structure and relationships of a concept define the concept.	Written descriptions, coding rules and guidance, and the place of the code within the classification	Logical, computable relationships such as: Is a Has finding site Has clinical course Has associated morphology

What is so difficult?

The Hobbit – An Unexpected Journey
(J.R.R. Tolkien)

" “Good Morning!" said Bilbo, and he meant it. The sun was shining, and the grass was very green. But Gandalf looked at him from under long bushy eyebrows that stuck out further than the brim of his shady hat.

"What do you mean?" he said. "Do you wish me a good morning, or mean that it is a good morning whether I want it or not; or that you feel good this morning; or that it is a morning to be good on?"

"All of them at once," said Bilbo”

The Problem ... the Meaning

- Healthcare is complex and its language even more so and a simple solution just won't do it
- Representation of clinical information is complex – SNOMED CT is complex for this reason
- Words and phrases change meaning according to:
  - The context in which they are used
  - The place where they are used
  - The disciplines and specialities using them
  - The time when they are used.

Which cold do you mean?

- cold (ABC) cold sensation quality as in
  - “I feel cold when I’m outside in the snow”.
- cold (DEF) common cold
  - I feel awful, I have a cold.
- COLD (GHI) chronic obstructive lung disease
  - Mrs Smith has been suffering from cold for many years and is suffering from an acute exacerbation

The Structure of SNOMED CT

- Hierarchies,
- Concepts, Descriptions and Relationships (hierarchies),
- Morbidity - single purpose at a single point in time within an episode - known code system and code per condition, procedure, cause

Terminology / Ontology

- A structured, human and machine-readable representation of concepts
  - Represent inherent meanings of each concept by relationships
  - Apple
  - is a fruit

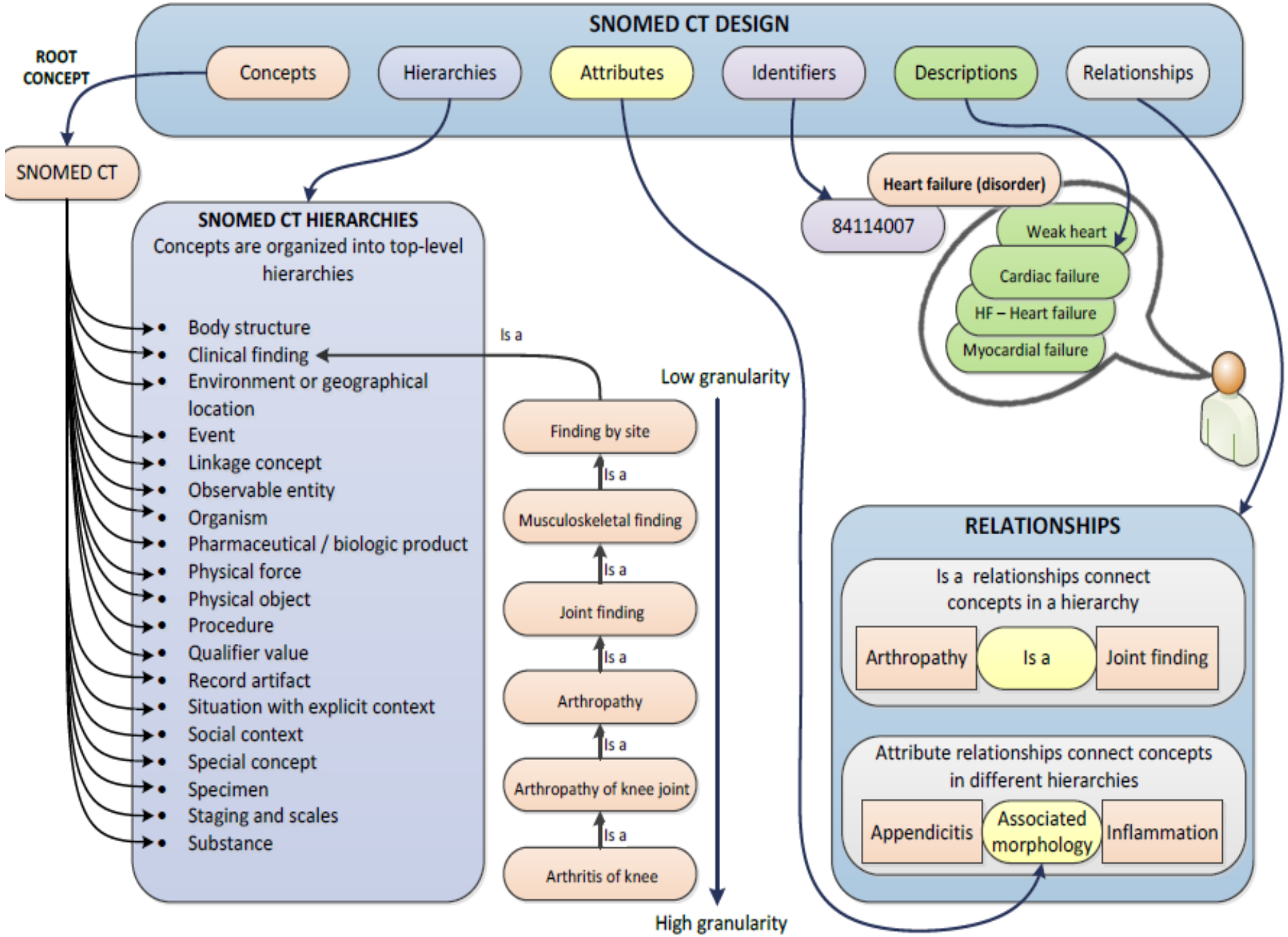
  - is produced by tree of the genus Malus
  - Supports retrieval by defining attributes
  - Gets complex and large very quickly

Welcome to SNOMED International

SNOMED International determines global standards for health terms, an essential part of improving the health of humankind.

We are committed to maintaining and growing our leadership as the global experts in healthcare terminology, ensuring that SNOMED CT, our world-leading product, is accepted as the global common language for health terms.

SNOMED CT design and development



Why Interoperability is Hard

- Information crossing boundaries of interpretive communities
  - Translation - A to HL7; HL7 to B
  - Bit-perfect - Computers are digital
  - User language - Each specialty has its own context-specific dialect
  - Developer language - Each vendor has its own computer-specific dialect

Semantic Interoperability

- Ability to interchange data and to interpret and use the data according to its meaning
  - not words or codes but meaning
- Source system – extract data
  - send to another system
- Receiving system - correctly process and action clinical information without changing meaning to:
  - identify if test already done
  - Provide reminders according to computer based rules
  - Provide warnings, alerts and knowledge when needed
  - Identify common trends and profiles of care to improve practice.

SNOMED CT – Pros and Cons

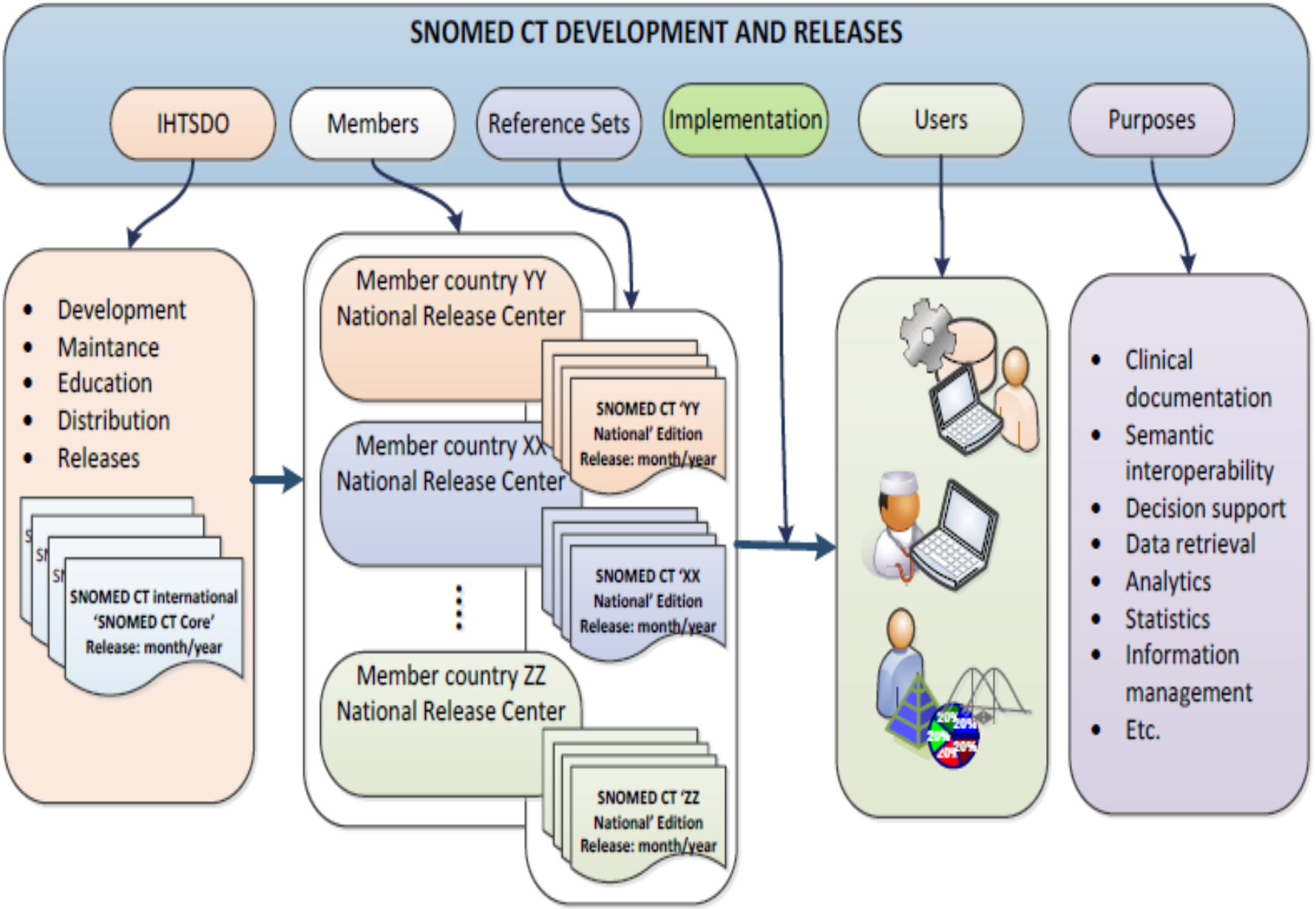
- Problems of SNOMED CT - Legacy baggage, lack of transparency, limited access, lack of good web-based tools, complexity, full post-coordination is not yet a practical proposition, undefined boundaries
- Benefits of SNOMED CT - Future-proof structure, can be improved and made fit for purpose, inherently multi-lingual, broad coverage

Mapping and Subsets

- Understand use case for mapping of SNOMED CT to other terminological resources examples, issues and problem. Check also ISO standards in development
- Specific to your implementation - If you want x functionality what skills will you need in your organisation to build this accurately
- There are nationally and internationally defined subsets ... check these first

Mapping (to and from) SNOMED CT

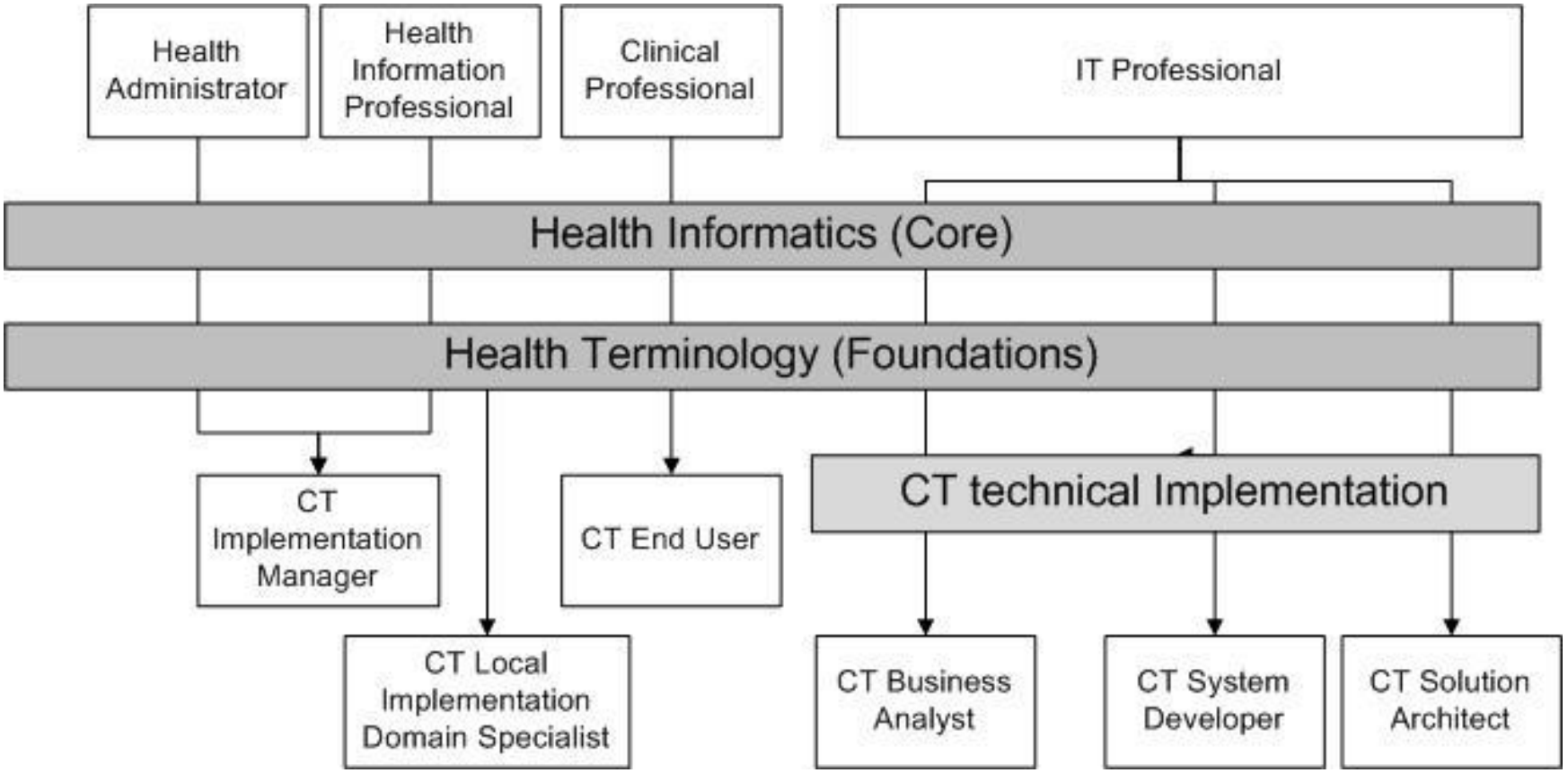
- Mapping data from clinical records encoded using non-SNOMED CT code systems to SNOMED CT for analysis may be considered when there is a requirement to produce:
  - Management information for care service audit or delivery planning
  - Statistical information for epidemiology
  - Links from clinical records to clinical knowledge resources
  - Links between clinical records and decision support tools
  - An integrated data warehouse for querying from multiple heterogeneous sources
  - Other types of research, reports or surveillance that requires SNOMED CT
- Two important characteristics of a map, which affect its ability to be used for a particular purpose, are the direction of the map, and the correlation between the source and target codes.
- Designing and authoring maps requires expertise and appropriate resources. Large maps e.g. tens of thousands of codes are typically created and maintained by SNOMED International, National Release Centres, large healthcare organizations, specialist data suppliers and large system vendors. However, smaller maps may be created and maintained by smaller system suppliers, hospitals or clinics. Maps must be maintained to ensure that both the SNOMED CT content and non-SNOMED CT content remains current whenever either code system is updated.


SNOMED CT DEVELOPMENT AND RELEASES
IHTSDO
Members
Reference Sets
Implementation
Users
Purposes
Development
Maintance
Education
Distribution
Releases
SNOMED CT international 'SNOMED CT Core' Release: month/year
Member country YY National Release Center
SNOMED CT 'YY National' Edition Release: month/year
Member country XX National Release Center
SNOMED CT 'XX National' Edition Release: month/year
Member country ZZ National Release Center
SNOMED CT 'ZZ National' Edition Release: month/year
Clinical documentation
Semantic interoperability
Decision support
Data retrieval
Analytics
Statistics
Information management
Etc.

Skills Needed

- SNOMED CT Core +
  - SNOMED CT general principles
  - SNOMED CT structure and contents
  - SNOMED CT tools
  - SNOMED CT reference sets
    - The purpose
    - Understand the results of applying a reference set mechanism
    - Identify implementation issues related to reference set mechanisms
  - Clinical terminology map use

SNOMED CT Implementers



IHTSDO Education SIG Status of Implementer Competency Specification Development 2013 – Grain, Ryan, Jones et al

Lessons Learned from Implementation (1)

- Implementing an EPR was a big change for clinicians and on top we implemented SNOMED CT. Clinicians went from free text on paper forms to an electronic look up of SNOMED CT terms
- The initial training for EPR GO LIVE concentrated on the EPR and did not concentrate enough on the training needed on SNOMED CT terms
- TRFT spent 6 months following the initial implementation period providing dedicated 1-1 training by SNOMED CT Specialist on how to search, which terms to choose, using favourites and subsets
- Clinicians complained there was too much choice using SNOMED CT. We had to concentrate on setting up the users favourites (and subsets) to lower the amount of terms in the look up

Lessons Learned from Implementation (2)

- The favourite's functionality initially was not designed to meet the clinicians need. This provided them one big list and the clinicians would like to have multiple smaller lists (recommend better use of subsets)
- Having access to SNOMED CT specialist(s) was essential
- Need to have a clinical lead from each speciality to help determine user favourites and subsets. This was set up as part of post implementation phase
- Clinical coding team was not sufficiently engaged with initially and therefore not prepared for the change EPR and SNOMED CT would bring
- Their role has changed to include more of an assurance function. i.e. the outpatient batch coding was automated but then required the coders to check the files

Benefits … is it worth it?

- To get the full benefit from an Electronic Patient Record the content must be recorded using a clinical terminology. Supports true digitisation.
- It is designed by clinicians for clinicians
- Safety case is supported by contextual information i.e. it is easier to understand unintended consequences
- Interoperability is better (and will get better with primary care using SNOMED CT)
- Implementing mandatory National Datasets is easier. ECDS was straightforward and TRFT was the first trust in England to send daily submissions. Met CQUIN target and additional early adopter bonus (£20K).

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