

# SNOMED CT

## An Introduction

SCIMP

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# Stands for!

- **S**ystematised
- **N**omenclature
- **O**f
- **MED**icine
- **C**linical
- **T**erms

Is...

# What is SNOMED CT?

SNOMED CT:

- Is the most comprehensive
- Is a resource with complete
- Enables consistent, precise
- Is mapped to other international
- Is already used in more than 100 countries

The **Systematized Nomenclature of Medicine (SNOMED)** is a systematic, computer-processable collection of medical terms, in human and veterinary medicine, to provide codes, terms, synonyms and definitions which cover anatomy, diseases, findings, procedures, microorganisms, substances, etc.

records.



= A spade

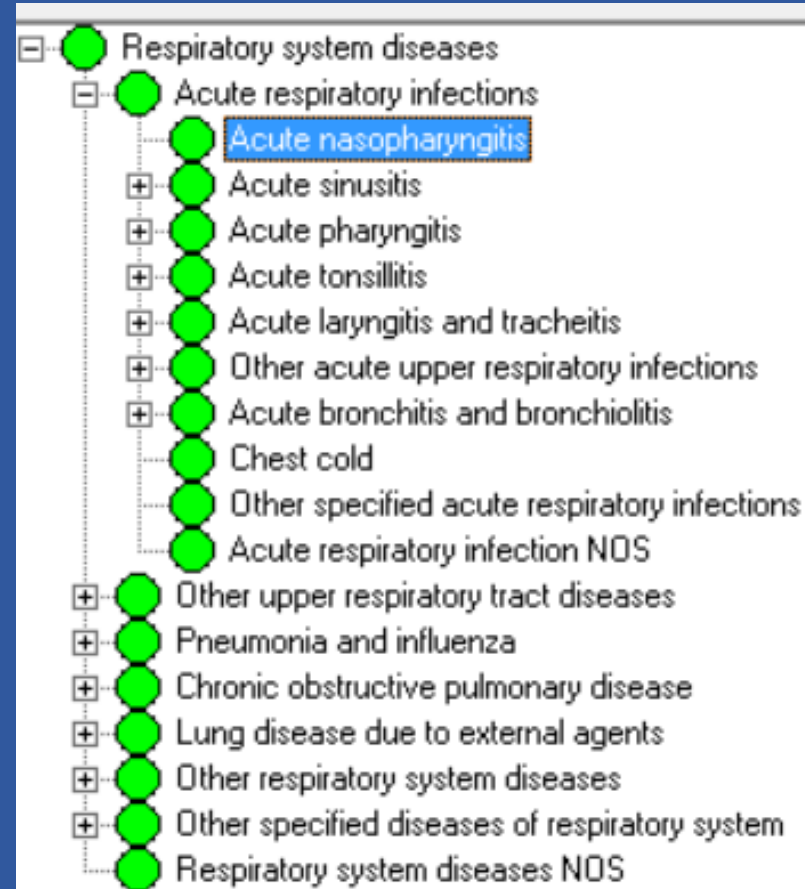


= Common Cold

82272006

# Read Codes

- Occupations
- History / symptoms
- Examination / Signs
- Diagnostic procedures
- Laboratory procedures
- Radiology/physics in medicine
- Preventive procedures
- Operations, procedures, sites
- Other therapeutic procedures
- Administration
- Infectious and parasitic diseases
- Neoplasms
- Endocrine, nutritional, metabolic and immunity disorders
- Diseases of blood and blood-forming organs
- Mental disorders
- Nervous system and sense organ diseases
- Circulatory system diseases
- Respiratory system diseases
- Digestive system diseases
- Genitourinary system diseases
- Complications of pregnancy, childbirth and the puerperium
- Skin and subcutaneous tissue diseases
- Musculoskeletal and connective tissue diseases
- Congenital anomalies
- Perinatal conditions
- [D]Symptoms, signs and ill-defined conditions
- Injury and poisoning
- Causes of injury and poisoning
- [X]External causes of morbidity and mortality
- Unspecified conditions



- Flat Hierarchy
- Parent & Child
- One way up or down

# Keyword

Read Dictionary

Find Read Term

Keyword:  Search Text:  Find

Code	Term	<input type="checkbox"/> Display from Formulary	<input type="checkbox"/> Display
12C2	FH: MI- Myocardial infarct <60		
12C3	FH: MI- myocardial infarct >60		
G111	Mitral incompetence - rheumatic		
G132	Mitral incompetence and aortic stenosis		
*G133	Mitral and aortic incompetence		
G30.	Cardiac rupture following myocardial infarction (MI)		
G30.	MI - acute myocardial infarction		
G3110	MI - myocardial infarction aborted		
*G32.	Old myocardial infarction		
G32.	Healed myocardial infarction		
G32.	Personal history of myocardial infarction		
*G35.	Subsequent myocardial infarction		
*G36.	Certain current complication follow acute myocardial infarct		
*G38.	Postoperative myocardial infarction		

Keywords:  Display All Keywords

M-I, M.I., MI, MI.

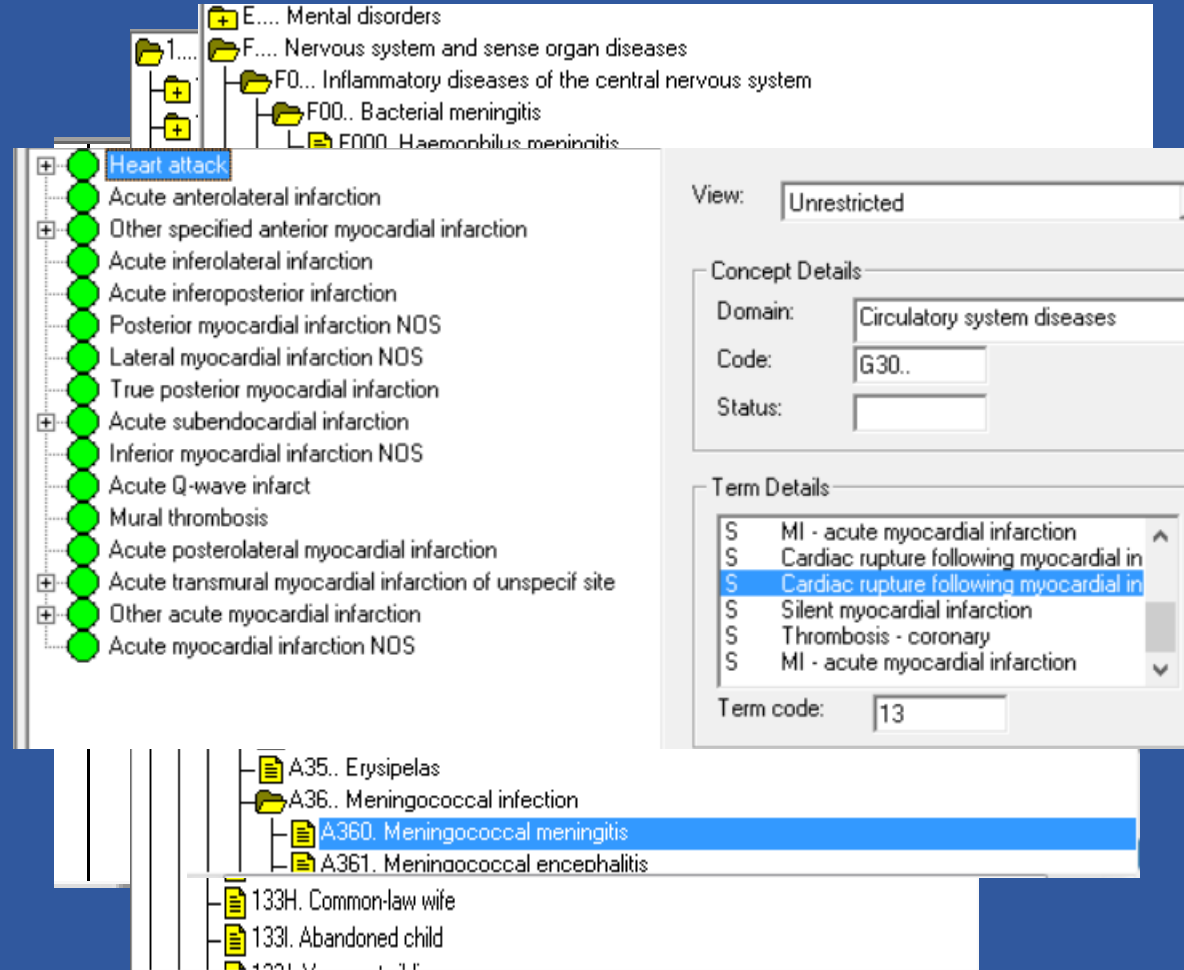
Synonyms:  Display Preferred Term  Display Synonyms

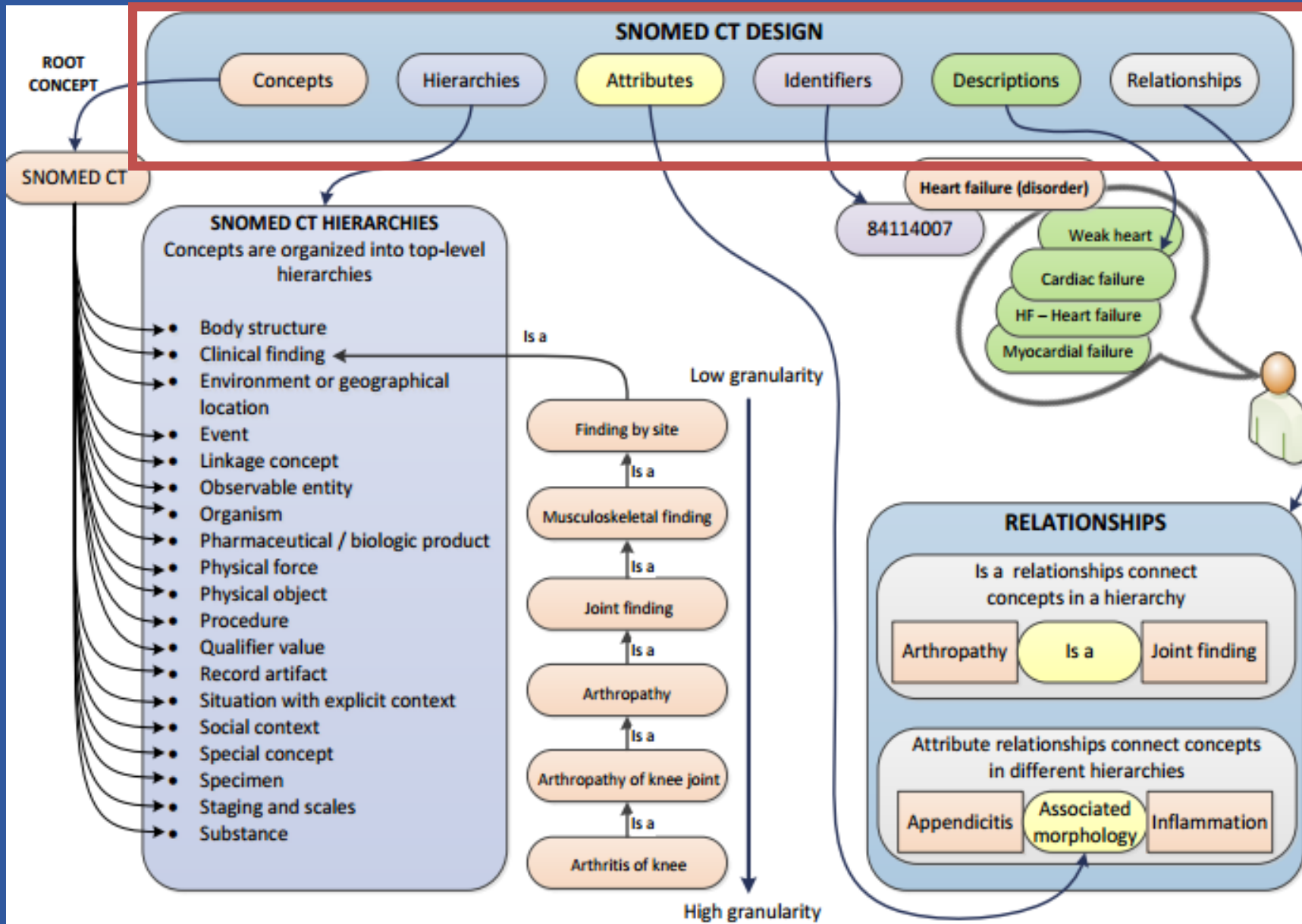
\*Acute myocardial infarction  
Attack - heart  
Coronary thrombosis

- Code – 5 Bytes H33..
- Term – the description
- Keywords – shorthand (not in SNOMEDCT)
- Synonyms and Preferred Terms

# Problems with Read

- Qualifiers
  - Negation
- Semantic issues
  - Student
  - CKD
- Flat Hierarchy
- Incorrect Synonyms
- Scalability & Scope







# Concept



“Common cold”

Common cold (disorder)

SCTID: 82272006



“On Exam Blood Pressure”

On examination – bp reading (finding)

SCTID: 163020007



“Gout”

Gout (disorder)

SCTID: 90560007

Created by the Scottish Clinical Information Management In Practice

- ▼ ● SNOMED CT Concept
  - ▶ ● Body structure (body structure)
  - ▶ ● Clinical finding (finding)
  - ▶ ● Environment or geographical location (environment / location)
  - ▶ ● Event (event)
  - ▶ ● Observable entity (observable entity)
  - ▶ ● Organism (organism)
  - ▶ ● Pharmaceutical / biologic product (product)
  - ▶ ● Physical force (physical force)
  - ▶ ● Physical object (physical object)
  - ▶ ● Procedure (procedure)
  - ▶ ● Qualifier value (qualifier value)
  - ▶ ● Record artifact (record artifact)
  - ▶ ● Situation with explicit context (situation)
  - ▶ ● SNOMED CT Model Component (metadata)
  - ▶ ● Social context (social concept)
  - ▶ ● Special concept (special concept)
  - ▶ ● Specimen (specimen)
  - ▶ ● Staging and scales (staging scale)
  - ▶ ● Substance (substance)

“Body parts”  
 “Illnesses”  
 Body Structure (body structure)  
 Clinical finding (finding)  
 SCTID: 123037004  
 SCTID: 404684003

**| Clinical finding |** represents the result of a clinical observation, assessment or judgment and includes normal and abnormal clinical states (e.g. **| asthma |**, **| headache |**, **| normal breath sounds |**). The **| clinical finding |** hierarchy includes concept used to represent diagnoses.

**| Procedure |** represents activities performed in the provision of health care. This includes not only invasive procedures but also administration of medicines, imaging, education, therapies and administrative procedures (e.g. **| appendectomy |**, **| physiotherapy |**, **| subcutaneous injection |**).

**| Observable entity |** represents a question or assessment which can produce an answer or result (e.g. **| systolic blood pressure |**, **| color of iris |**, **| gender |**).

**| Situation with explicit context |** represents concepts in which the clinical context is specified as part of the definition of the concept itself. These include presence or absence of a condition, whether a clinical finding is current, in the past or relates to someone other than the subject of the record (e.g. **| endoscopy arranged |**, **| past history of myocardial infarction |**, **| family history of glaucoma |**).

Is a

The image shows a screenshot of a clinical classification system. On the left, a tree view lists various diseases under the category 'Other bacterial diseases'. The terms are: Other bacterial diseases, Leprosy, Other mycobacterial diseases, Diphtheria, Whooping cough, Streptococcal sore throat and scarlatina, Erysipelas, Meningococcal infection, Meningococcal meningitis, Meningococcal encephalitis, Meningococcal septicaemia, Waterhouse-Friderichsen syndrome, and Meningococcal carditis. Two red ovals labeled 'IS A' are positioned between the tree and a details panel. Arrows point from 'Other bacterial diseases' to the top 'IS A' oval, from 'Meningococcal meningitis' to the bottom 'IS A' oval, and from both 'IS A' ovals to 'Meningococcal infection'. The details panel on the right shows 'View: Unrestricted', 'Concept Details' with 'Domain: Infectious/parasitic diseases', 'Code: A360.', and 'Status:'. Below this, 'Term Details' shows 'P Meningococcal meningitis'.

# ISA

The screenshot displays a hierarchical list of clinical terms on the left and a details panel on the right. The list includes:

- Inflammatory diseases of the central nervous system
- Bacterial meningitis
- Haemophilus meningitis
- Pneumococcal meningitis
- Streptococcal meningitis
- Staphylococcal meningitis
- Meningitis - tuberculous
- Meningitis - meningococcal (highlighted in blue)
- Meningitis in other bacterial disease cla
- Other specified bacterial meningitis
- Bacterial meningitis NOS

Two red ovals labeled "ISA" are positioned over the interface. Orange arrows indicate ISA relationships:

- From "Meningitis - meningococcal" to "Bacterial meningitis"
- From "Meningitis - meningococcal" to "Inflammatory diseases of the central nervous system"
- From "Meningitis in other bacterial disease cla" to "Bacterial meningitis"
- From "Meningitis in other bacterial disease cla" to "Inflammatory diseases of the central nervous system"

The details panel on the right shows:

- Unrestricted (dropdown menu)
- Concept Details:
  - Domain: Nervous system/sense organ dis
  - Code: F005.
  - Status: [empty field]
- Term Details: [empty field]

# “Meningitis caused by meningococci”

Other Bacterial Disease

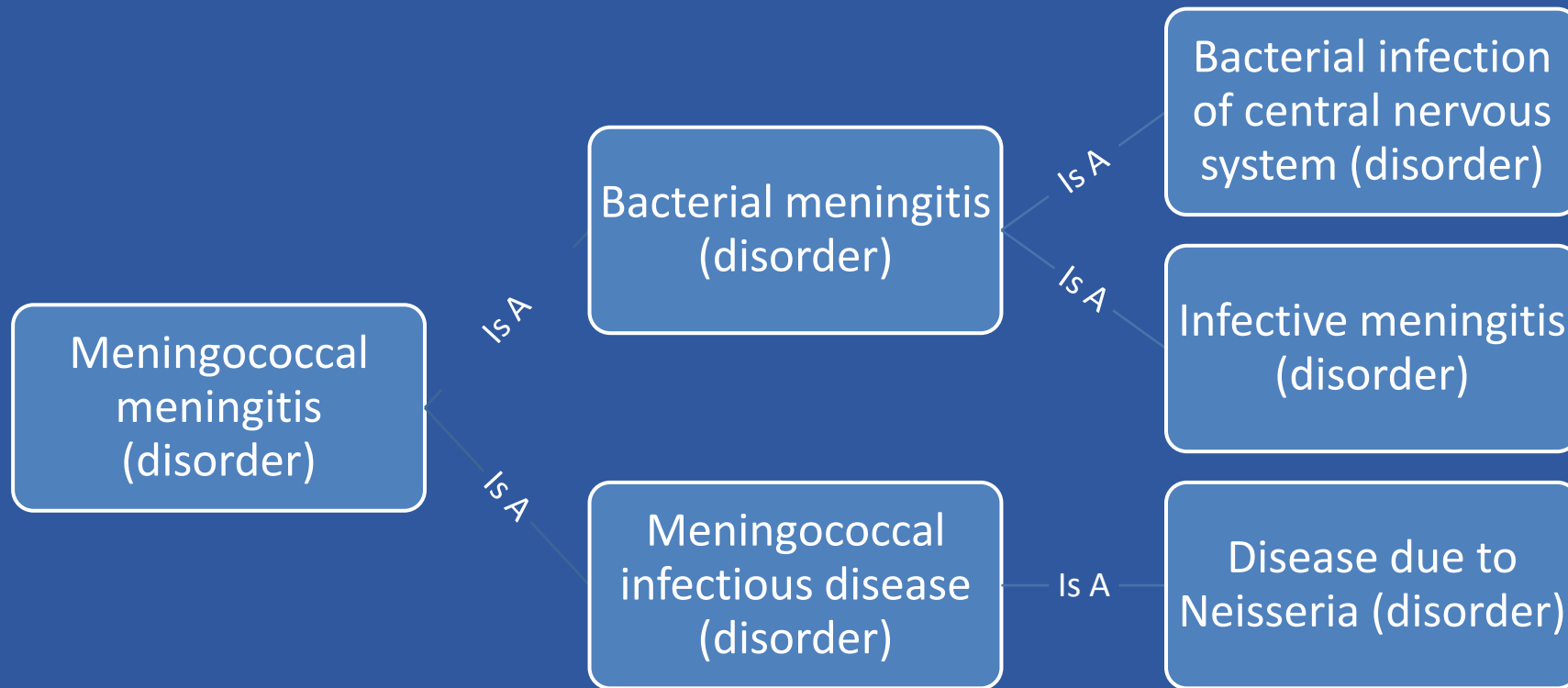
A360..

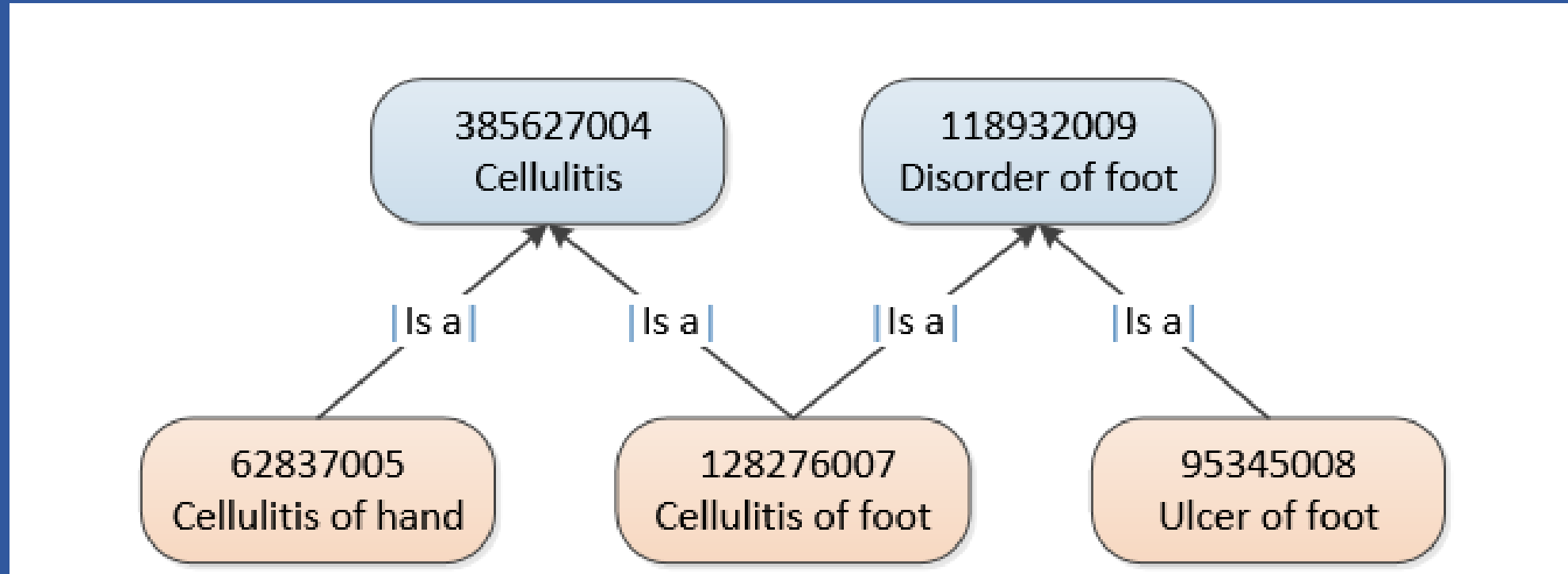
OR

Inflammatory Disease of CNS

F005.

But not both at the same time...







coffee & chat

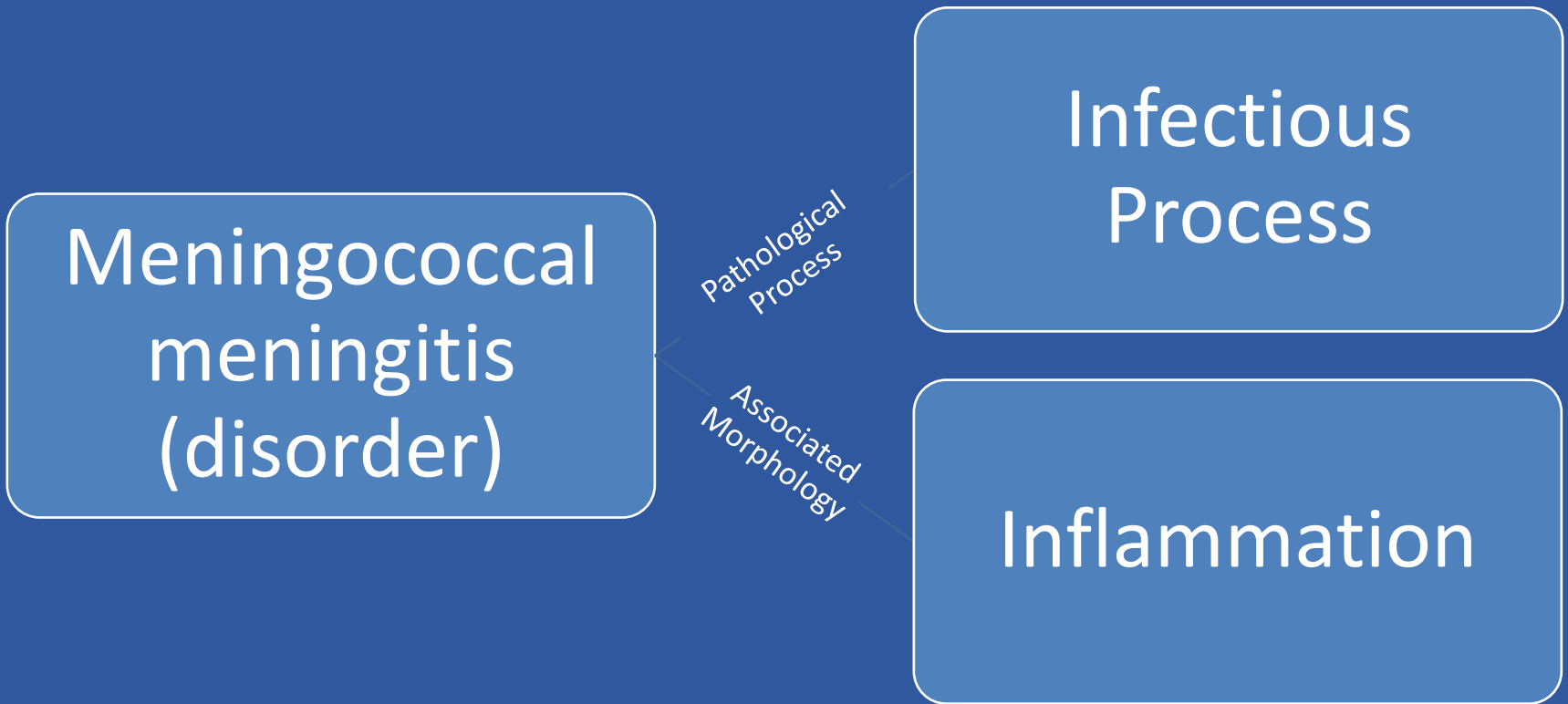
MORE  
FUN than  
a handbag  
Full of  
SNAKES

# Review!

- SNOMEDCT – Stands for...
- Concept – core idea
- Fully Specified Name
- Concept ID
- Polyhierarchy

# Attributes (Relationship Types)

- Further defines concepts
  - Finding Site – what bit does it affect?
  - Causative Agent – what thing causes this?
  - Associated Morphology – what happens at a tissue level?
- 50 types used by 9 hierarchies
- Logical model stops silliness
  - Domain – The Hierarchy to which the attribute can be applied  
|Procedure| cannot have |associated morphology|
  - Range – the set of concepts allowed as values  
The range for the attribute |finding site| is |body structure|



192644005  
Meningococcal meningitis (disorder)



95883001  
Bacterial meningitis (disorder)

23511006  
Meningococcal infectious disease (disorder)



370135005  
Pathological process (attribute)

441862004  
Infectious process (qualifier value)

116676008  
Associated morphology (attribute)

23583003  
Inflammation (morphologic abnormality)

363698007  
Finding site (attribute)

1231004  
Meninges structure (body structure)

246075003  
Causative agent (attribute)

409822003  
Superkingdom Bacteria (organism)



370135005  
Pathological process (attribute)

441862004  
Infectious process (qualifier value)

246075003  
Causative agent (attribute)

17872004  
Neisseria meningitidis (organism)

# Identifiers

- Are the numbers
- Unique for every concept, description, relationship
- Up to 18 digits
- Not going to remember them!
- Use your words!

☰ Urinary tract infectious disease (disorder) ☆

SCTID: 68566005

68566005 | Urinary tract infectious disease (disorder) |

Urinary tract infectious disease (disorder)

UTI - Urinary tract infection

Urinary tract infection

Urinary tract infectious disease

# Descriptions

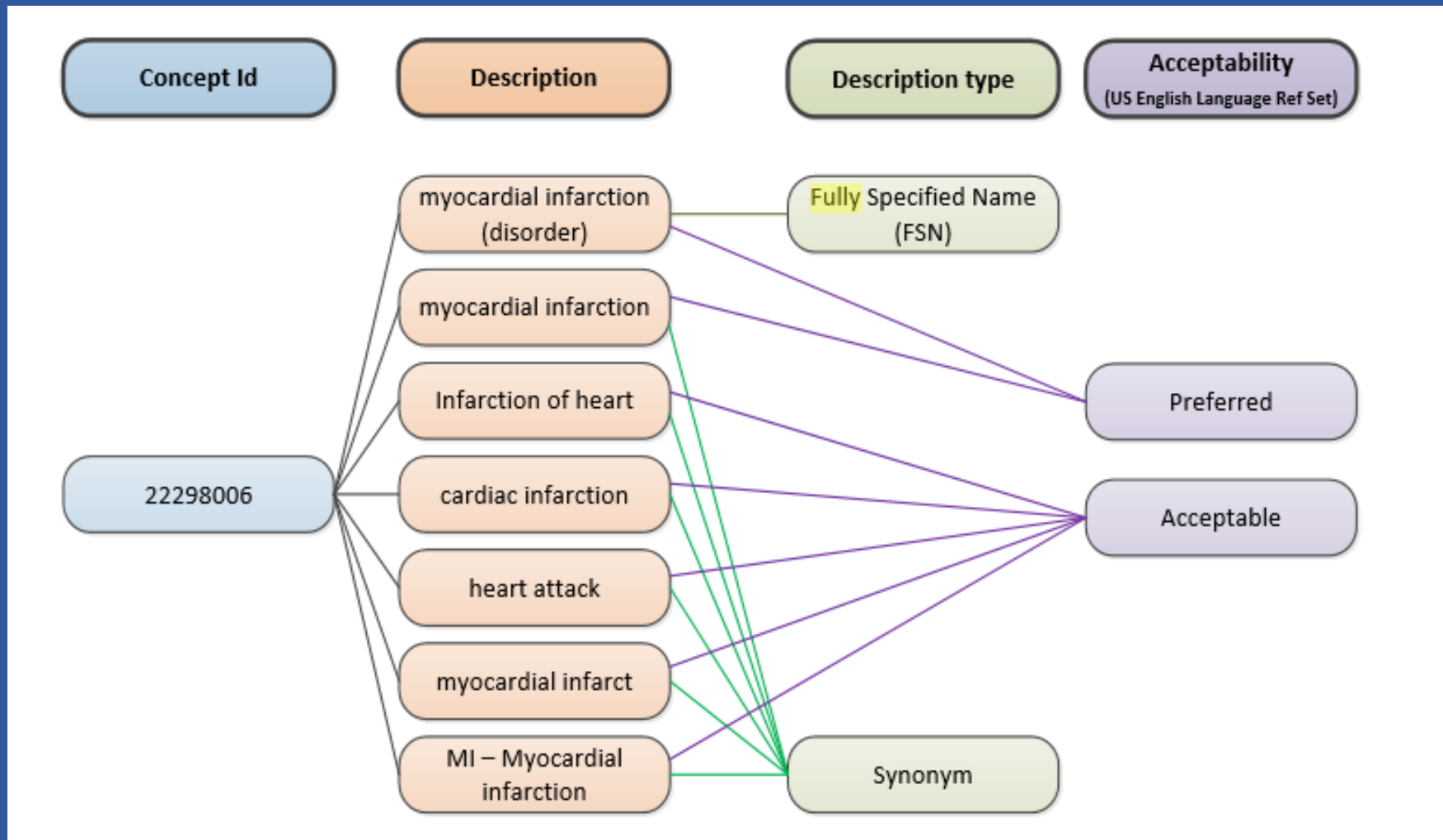
- Description Types
  - Fully Specified Name (has brackets (hierarchy))
    - Not meant to be used in records interfaces (!)
  - Synonyms
- Acceptability
  - Preferred (only one)
  - Acceptable (none to many)

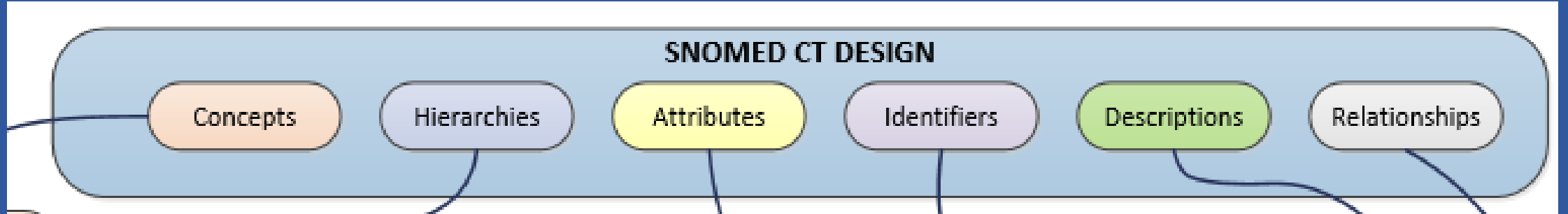
☰ Myocardial infarction (disorder)

SCTID: 22298006 , Fully defined , Active

Term	Acceptability(GB)
F ☆ Myocardial infarction (disorder)	Preferred
S ✓ Cardiac infarction	Acceptable
S ✓ Heart attack	Acceptable
S ✓ Infarction of heart	Acceptable
S ✓ MI - Myocardial infarction	Acceptable
S ✓ Myocardial infarct	Acceptable
S ★ Myocardial infarction	Preferred









# SNOMED CT Migration

- NHS Digital Requirements
- Why?
- When?
- What will happen?

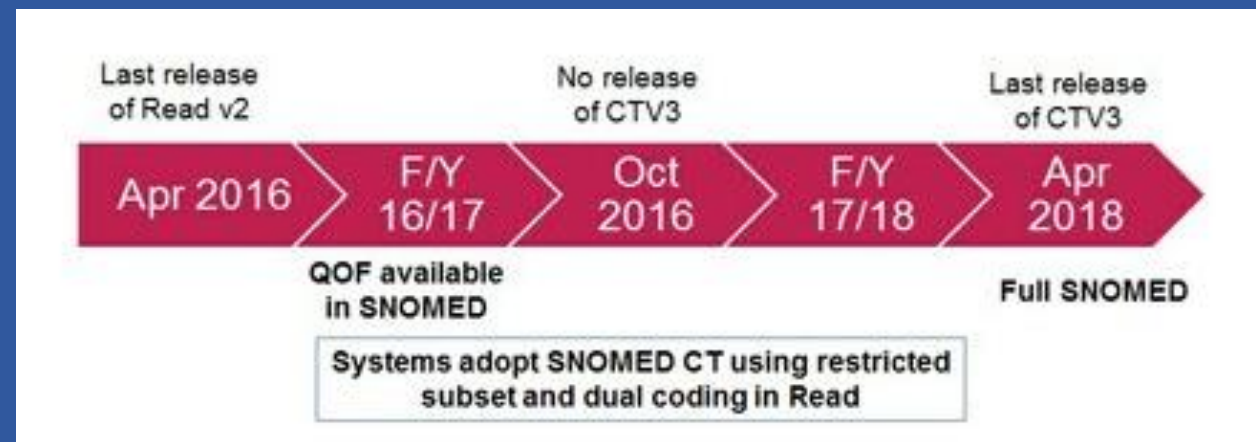
# Why?

- Read is full
- Read is wrong and cannot be changed
- SNOMED CT is across health care
- SNOMED CT is international
- SNOMED CT better at communicating computable clinical meaning

# When?

## Latest news

**2 June** - An [Advanced Notification](#) has been issued by the Standardisation Committee for Care Information (SCCI) which announced changes to the SNOMED CT standard, including that systems used by primary care service providers must adopt SNOMED CT as the clinical terminology within the system before the 1 April 2018.



# What will happen?

- Mapped Read to SNOMED CT
- Read Code and Term preserved on migrated data
- Assured terms
- Functions to be able to remap un-assured
- All user interaction driven by/using Read2 and CTV3 terminology to be driven by/using SNOMED CT
- SNOMED CT to Read for some terms
- Suppliers build interface
- Clinical Assurance Programme

# Pre & Post Co-ordination

## Pre-coordinated

- Use a single SNOMED CT identifier
- Already in SNOMED CT
- Provided for you

## Post-coordinated

- Contain more than one SNOMED CT identifier
- Allows additional detail e.g. laterality
- Expressed using SNOMED CT compositional grammar
- Can be computed to equivalence
- Can be used to generate clinical ideas not in SNOMED CT Pre-coordinated concepts



# Reference Sets

- A defined mechanism to:
  - Refer to a subset of SNOMED CT components
  - Add customised information to components
- Allows for:
  - Languages
  - Maps (from Read, ICD10)
  - Picklists
  - Hierarchies and Ordered Lists
- Need authored and maintained!

# More Information

- SNOMEDCT Starter Guide:
  - <http://snomed.org/sg.pdf.html>
- Browser:
  - <http://browser.ihtsdotools.org/>
- IHTSDO Learning Centre:
  - <http://www.ihtsdo.org/snomed-ct/learn-more>

The screenshot shows the IHTSDO website with a navigation bar at the top containing links for Home, IHTSDO, SNOMED CT (highlighted), and Participate. The main content area is divided into two columns. The left column has sections for 'What is SNOMED CT?', 'Why SNOMED CT?', and 'Learn More'. The 'Learn More' section lists several resources: 'E-Learning Overview', 'E-learning Server', 'SNOMED CT Foundation Course Applications', 'SNOMED CT Challenge', 'Document Library', 'Consultant Terminologist Program', and 'SCT Implementation Advisor Scheme'. Below this is a section for 'SNOMED CT Worldwide' and 'SNOMED CT & Other Terminologies'. The right column features a 'Learn More' section with a sub-section for 'SNOMED CT E-Learning Service'. It provides a paragraph about IHTSDO's online courses and a link to the 'E-Learning Overview'. Below that is the 'SNOMED CT Starter Guide' section, which describes the guide as a practical starting point for healthcare information and provides a link to download the latest version in Information Sheets. The 'SNOMED CT Document Library' section is also present, mentioning online and downloadable specifications, guides, and discussion papers. At the bottom of the right column is an 'Information sheets' section with a link to 'SNOMED CT - Starter Guide 2014--7-31'.



