

Who are we?



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Terminology and implementation support, with a focus on training and national adoption.



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Questions during the session: use the chat. Afterwards: info@snomed.org

Three-Part Session Agenda

PART ONE

Introduction

- 01 Why coded clinical data matters
- 03 What SNOMED CT is, and what it covers
- 03 Structured data entry, demonstrated
- 04 Code systems in Healthcare

PART TWO

SNOMED CT in EHDS

- 01 Health data does not travel well
- 02 What is the EHDS?
- 03 How EHDS preserves clinical meaning
- 04 What this means for Latvia?
- 05 What this means for You?
- 06 What does EHDS mean for all of us?

PART THREE

SNOMED CT in Practice

- 01 Is SNOMED CT too big?
- 02 Where is the evidence?
- 03 How difficult is it to implement?

Introduction

Anne Højen · SNOMED International

INTRODUCTION

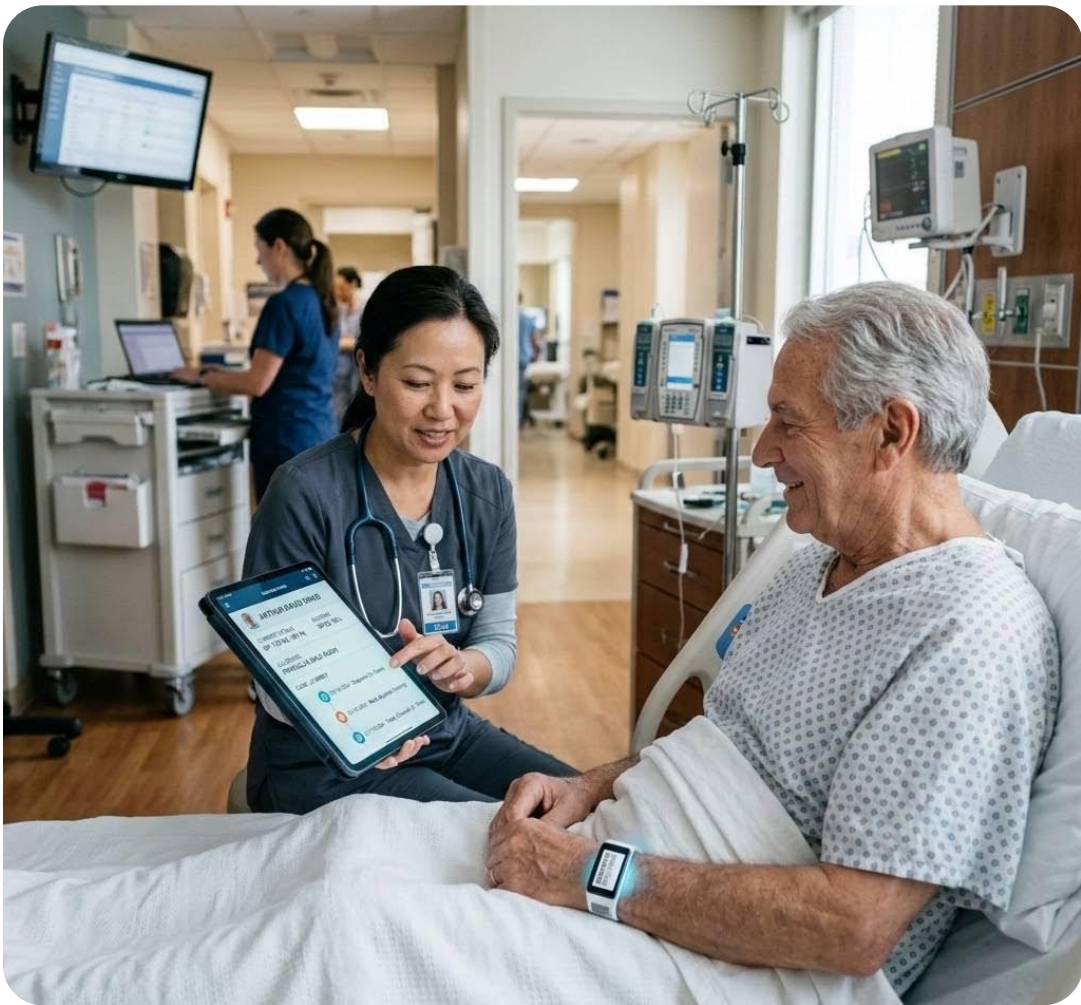
Why clinical terminology matters

Goals for Health IT & Clinical Data



Patient-Centered Care

Data is personal - it follows the patient across every care interaction.



**PATIENT** · Holistic Record

ACCURATE

Point of Care



- Ensuring health data is **accurate and precise** at the time decisions are made
- Supports consistent, data-informed clinical decisions

DETAILED

Rich Context



- Capturing **comprehensive, structured clinical data**
- Reflects the full history and nuanced medical background of the individual

SAFE

Patient Safety



- Protects patient safety across all clinical workflows
- Drives **better health outcomes**

Decision Support & Personal Treatments

Intelligent, real-time guidance seamlessly integrated into clinical workflows.

INTEGRATED Workflow Safety

- Guidance embedded in primary workflows
- Reduces cognitive burden & **prevents clinical errors**
- Ensures evidence-based guidelines are followed



AUTOMATED Real-Time Alerts

- **Instant safety checks** & conflict alerts at point of care
- Catches medication errors & drug interactions
- Flags known patient allergies before treatment



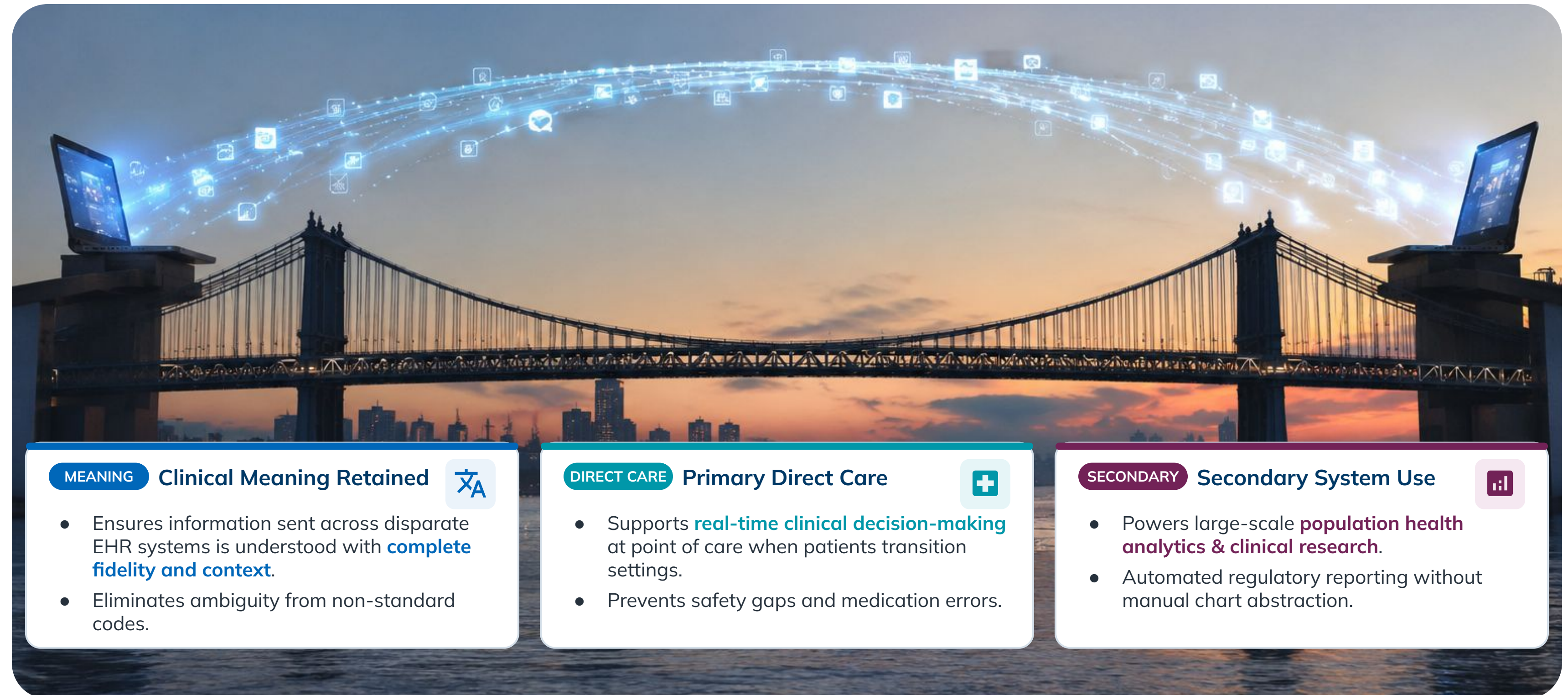
TAILORED Personalized Care

- Recommends **tailored order sets & therapies**
- Leverages complete, coded medical histories
- Precision pathways over one-size-fits-all care



Semantic Interoperability

Seamlessly bridging systems so data retains its full meaning across care boundaries.



Analytics & Research Enabled by Data

Unlocking population-level insights by reusing structured data for clinical research, disease registries, and quality benchmarking at scale.



POPULATION Population Insights



- Large-scale **population health management** & tracking
- Aggregates granular clinical data across care networks
- Identifies outcomes, trends, and risk factors at scale

RESEARCH Clinical Research



- Accelerates cohort discovery & trial recruitment
- Reuses **structured, coded EHR data** effortlessly
- Eliminates manual chart abstractions to improve data fidelity

BENCHMARKING Quality & Registries



- Powers disease registries & **automated quality benchmarking**
- Removes administrative burden from clinical teams
- Ensures consistent quality measurement across care settings

Cost-Effective Healthcare Ecosystem

Optimizing resource allocation, reducing administrative overhead, and maximizing clinical outcomes through connected health data.

EFFICIENCY

Reduced Overhead



- Automates manual reporting to lower **operational expenditure**.
- Streamlines clinical workflows to minimize redundant paperwork costs.

OPTIMIZATION

Resource Utilization and Allocation



- Eliminates **duplicate diagnostic testing** via complete history access.
- Optimizes real-time allocation of clinical assets and equipment.

PREVENTION

Preventive Savings



- Identifies high-risk populations early to avoid **costly interventions**.
- Shifts care from reactive treatments to proactive health management.



The Target: A Connected, Data-Driven Health Ecosystem

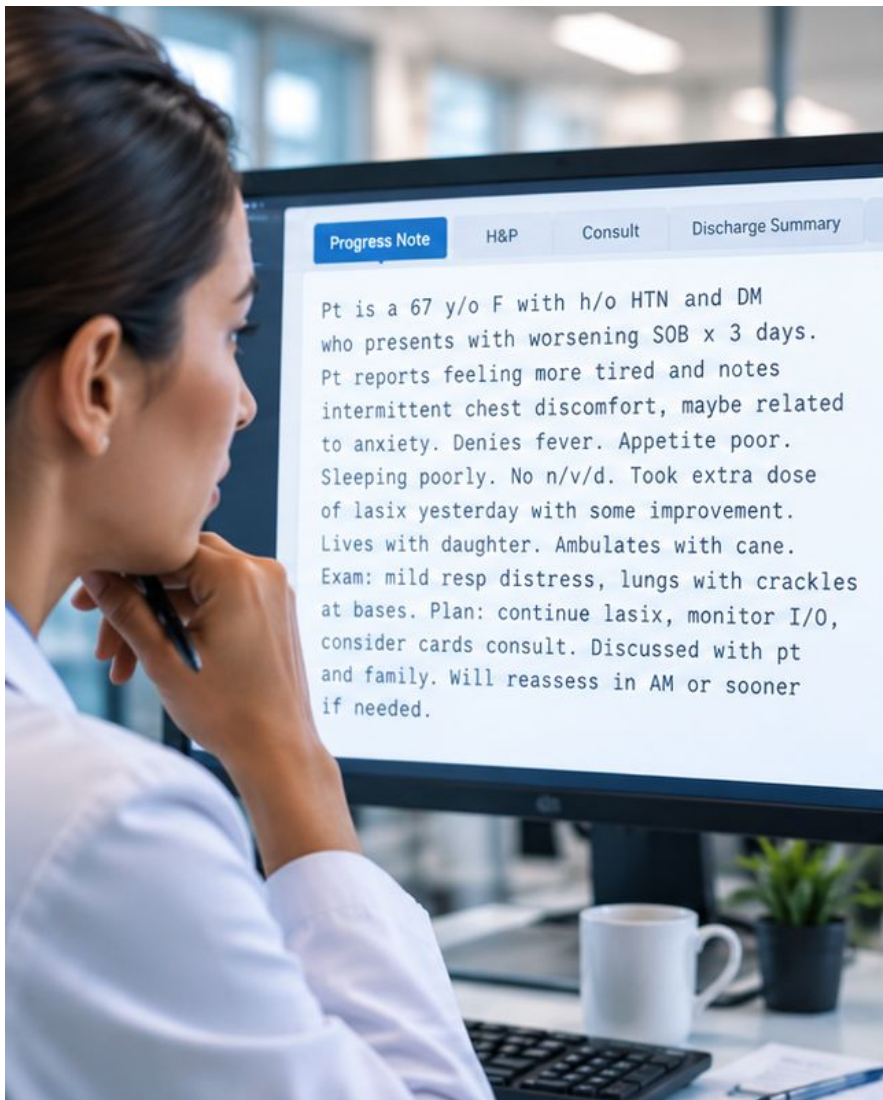


How clinical data is captured today

THE THREE MAJOR CHALLENGES IN MODERN HEALTH RECORDS

FORMAT

Free Text Narratives



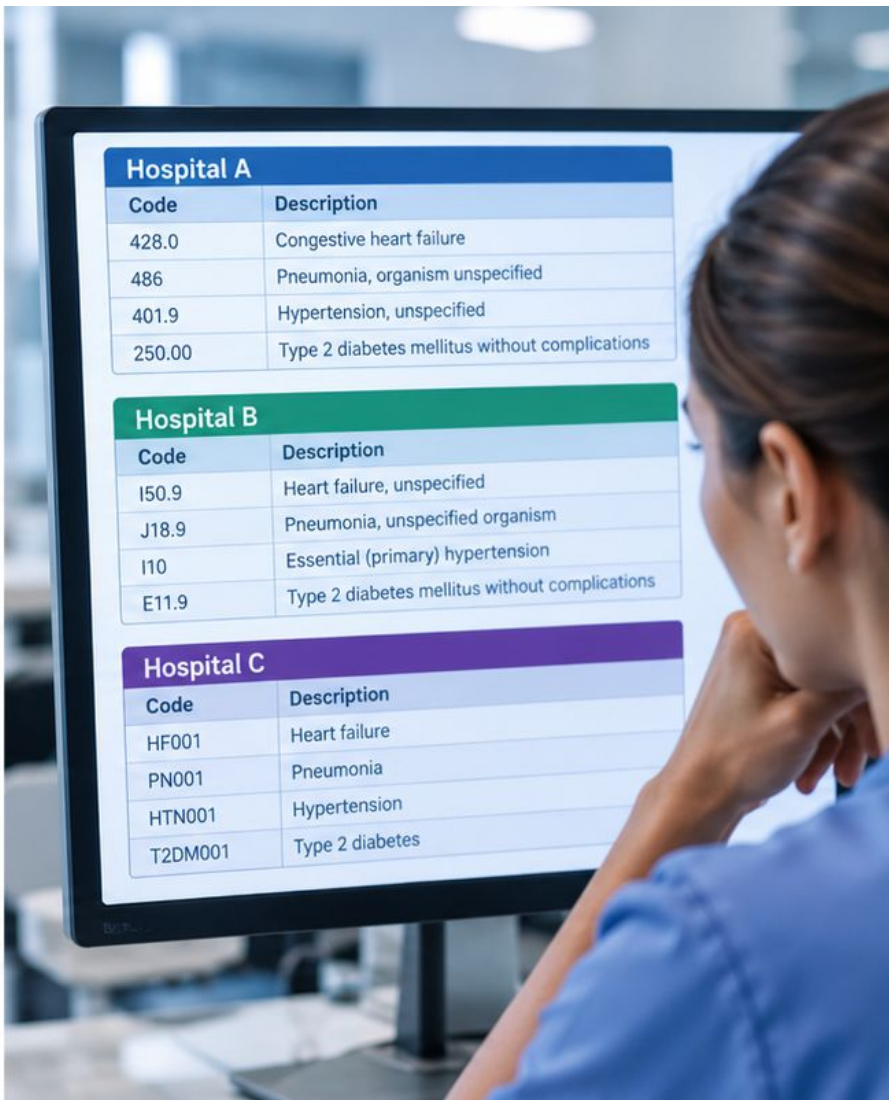
SEMANTICS

Ambiguous Terms & Jargon



CODING

Local Codes



Free text hides the signal

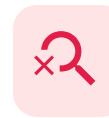
IN THE RECORD TODAY

TYPICAL PROGRESS NOTE

"65 yo M c/o CP x2h, hx of MI, started
on metoprolol."

Unstructured clinical narrative
Implicit context & local shorthand

THE PROBLEM



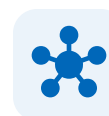
Can't be searched reliably

"MI", "heart attack" and "myocardial infarction" represent the same clinical event, but exist as three entirely separate text strings.



Can't trigger a decision-support alert

Clinical systems cannot execute automated logic or safety checks on unstructured sentences; they can only display them.



Can't be aggregated across systems

There is no shared, standardized way to count, compare, or analyze narrative text data across different healthcare organizations.

One abbreviation, several meanings

IN THE RECORD TODAY

WRITTEN IN AN ORDER OR A HANDOVER

MS

Ambiguous medical shorthand

THE PROBLEM

Morphine sulfate

an opioid painkiller

Magnesium sulfate

used for eclampsia and arrhythmias

Nothing in the record says which one was meant, so the next clinician has to guess

Local terms may be okay, as long as the meaning can be resolved and clarified instantly

Four clinics, one city, zero standard for the same condition

IN THE RECORD TODAY

Even within a single health system, departments record identical diagnoses differently:

PRIMARY CARE



"Type 2
Diabetes"

ENDOCRINOLOGY



"T2DM"

EMERGENCY DEPT



"Diabetes mellitus
type II"

INPATIENT WARD



"DM Type 2"

THE PROBLEM



Regional registries **fail to cohort patients** without complex string searching



The same cohort has to be searched for four ways, and a spelling nobody thought of is a **patient left out**



A referral between two of these departments carries words the receiving system **cannot act on**

Standardization makes information portable, understandable and reusable



PORTABLE

Traffic Lights

Universal signals travel anywhere without translation- instantly recognized across cultures.



UNDERSTANDABLE

Global Signage

Standardized iconography conveys instant clarity, transcending language barriers.



REUSABLE

Interlocking Bricks

Uniform standards allow modular components to be endlessly recombined into complex systems.

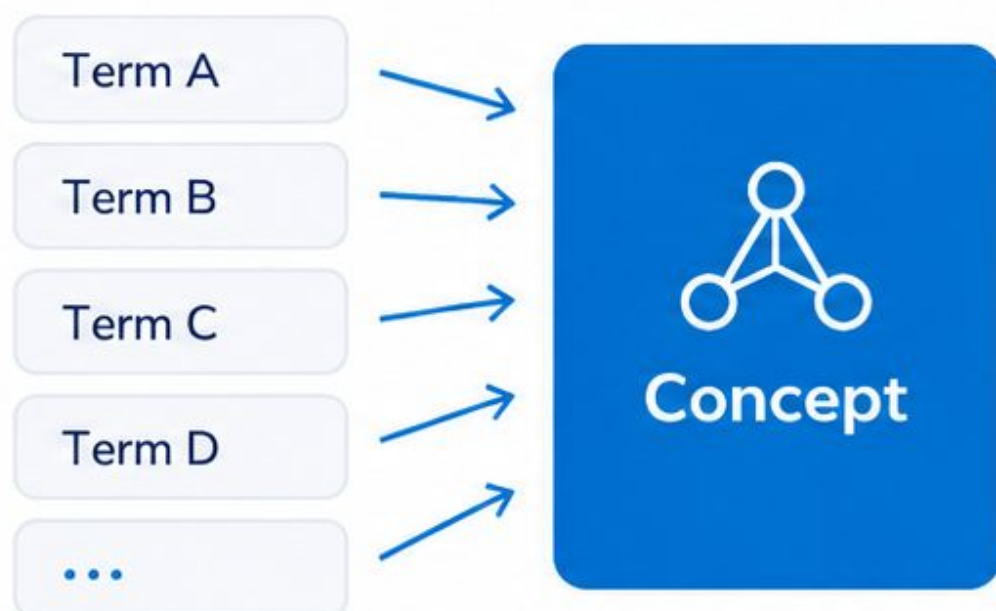
Shared standards transform complex data into portable, universally understood, and modular building blocks across systems.

Standardize **meaning** , not words - and make meaning **computable**

SEPARATE

Keep the term apart from the concept

Different words can refer to the same concept.



IDENTIFY

Give every concept one permanent identity

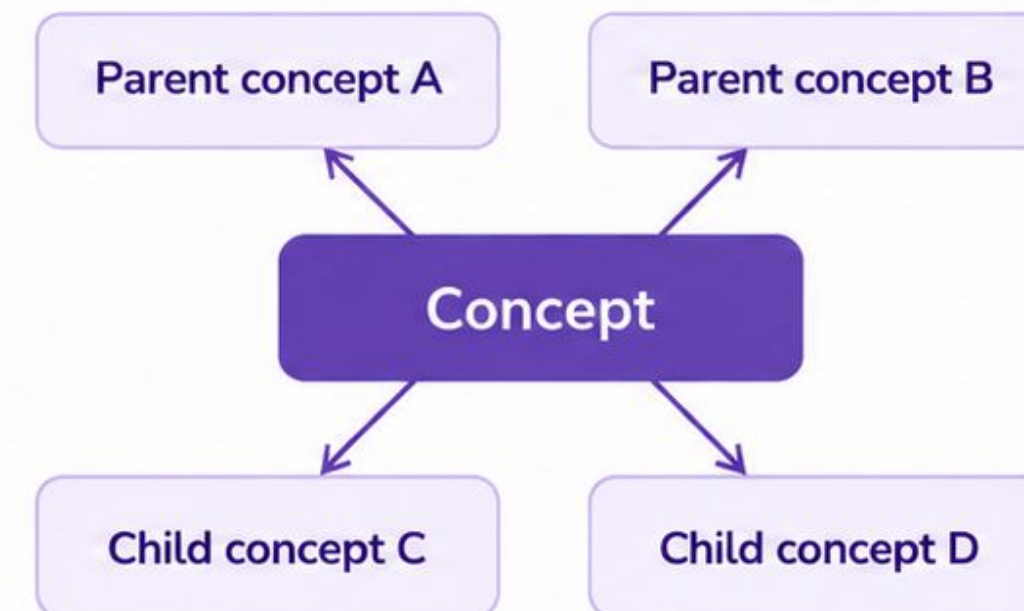
Each concept has a unique, stable identifier that never changes.



DEFINE

Meaning comes from relationships

A concept is defined by its relationships to other concepts and can have multiple parents.



SNOMED CT puts **meaning over text** into practice

SEPARATE · DESCRIPTIONS

Many terms, in many languages

Heart attack

MI - myocardial infarction

Cardiac infarction

Infarction of heart

Myocardial infarct

Infarto de miocardio **ES**

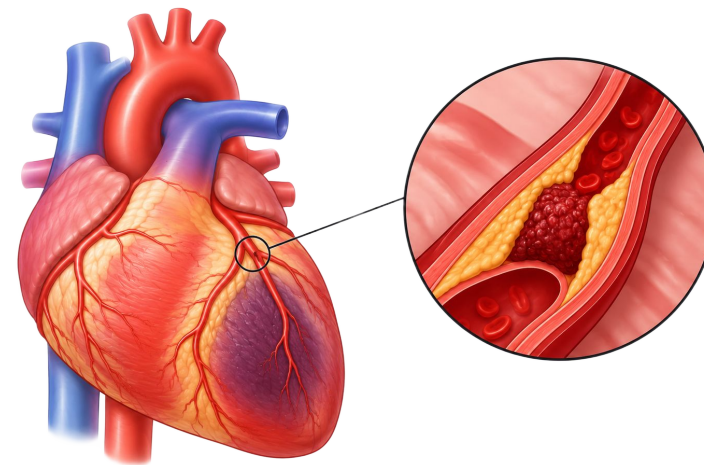
Herzinfarkt **DE**

National extensions add local terms and translations without changing the concept.

IDENTIFY · CONCEPT

One permanent identifier

22298006



One permanent identifier, independent of any language.

DEFINE · RELATIONSHIPS

Meaning a computer can reason with

Is a

Ischemic heart disease

Is a

Myocardial necrosis

Finding site

Myocardium structure

Morphology

Infarct

Two parents at once (poly-hierarchy). A query for either one also finds MI and all its subtypes, such as *Acute myocardial infarction*.

INTRODUCTION

What is SNOMED CT?

SNOMED International and Key Design Features

Who we are

"By 2030, Clinical Terminologies will be used globally, which will result in better health and improved patient outcomes, supported by one language of health."



WHO OWNS IT

Not-for-profit, member-owned

SNOMED International produces and maintains SNOMED CT on behalf of its members

WHO'S AT THE TABLE Owned by its members

54 Member countries

Governed through the General Assembly, representing member nations worldwide

WHO SHAPES THE WORK

Clinical and technical input

Advised by the Member Forum and expert Advisory Groups from across the community

Licensing follows the territory

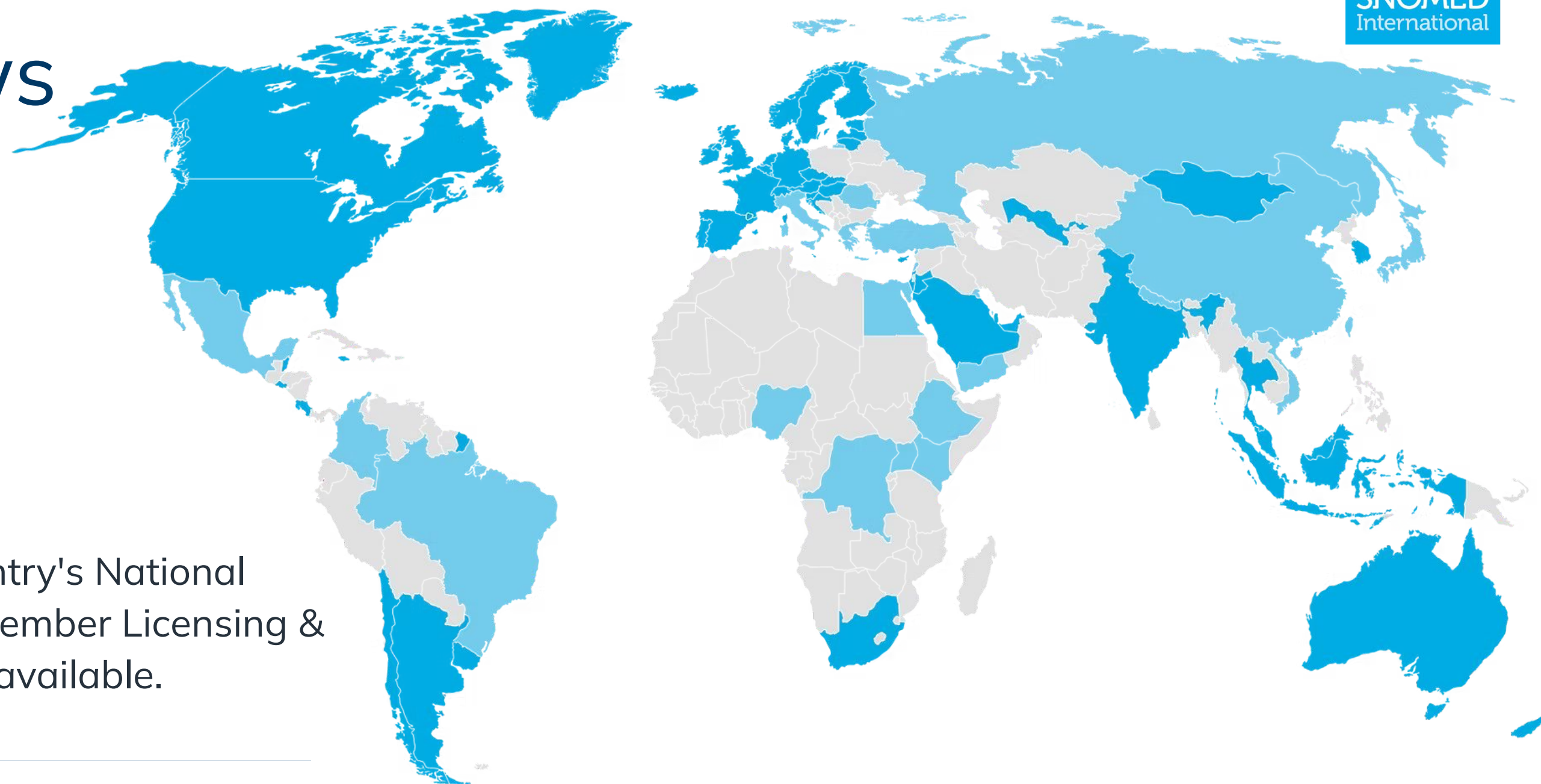
MEMBER COUNTRIES

Free to use. Register with your country's National Release Center, or access via the Member Licensing & Distribution Service (MLDS) where available.

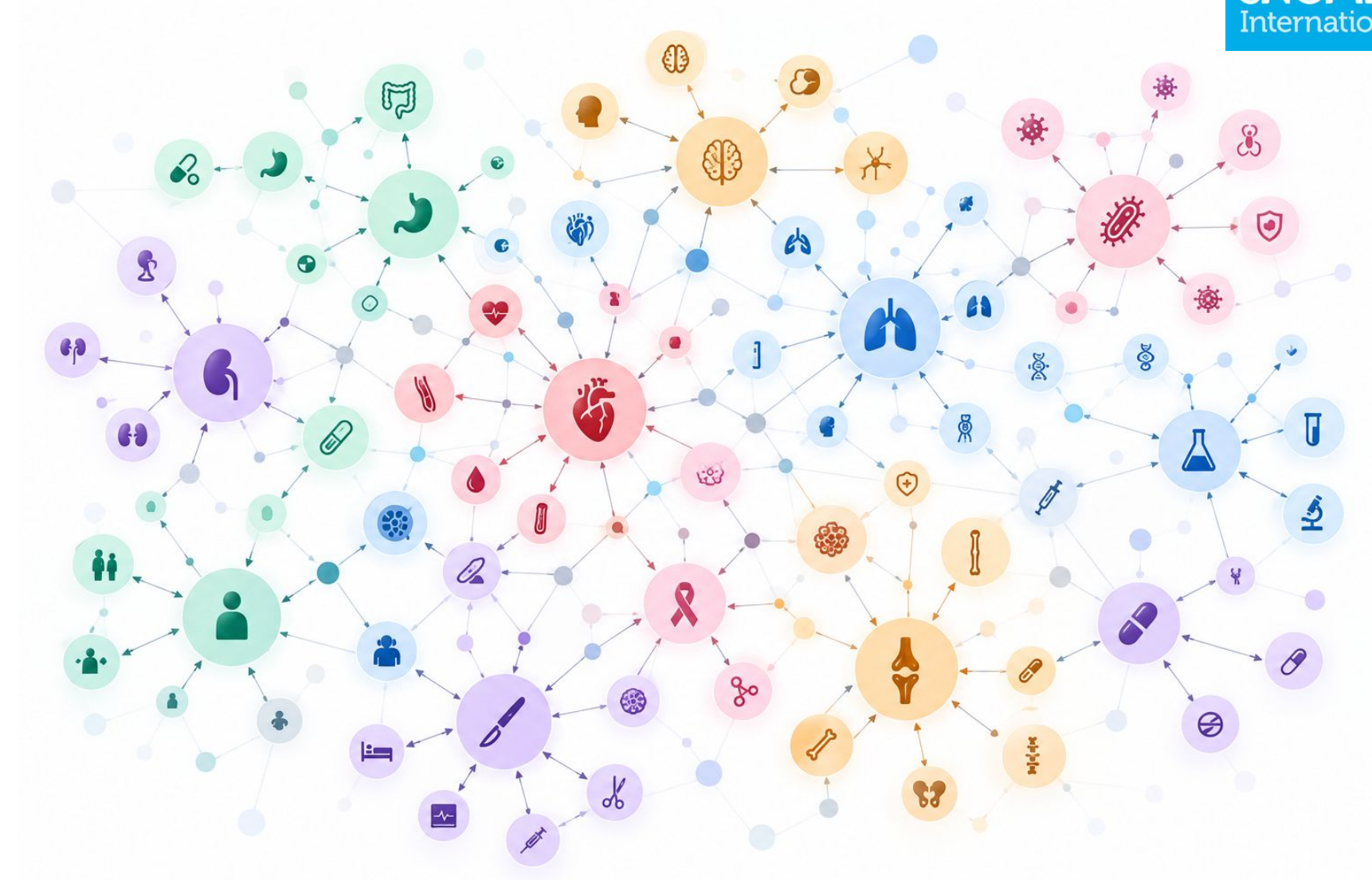
EVERYONE ELSE

An Affiliate License, applied for annually through MLDS. Fees are based on use and territory; a Statement of Usage is submitted each year.

54 countries and territories are currently
Members of SNOMED International



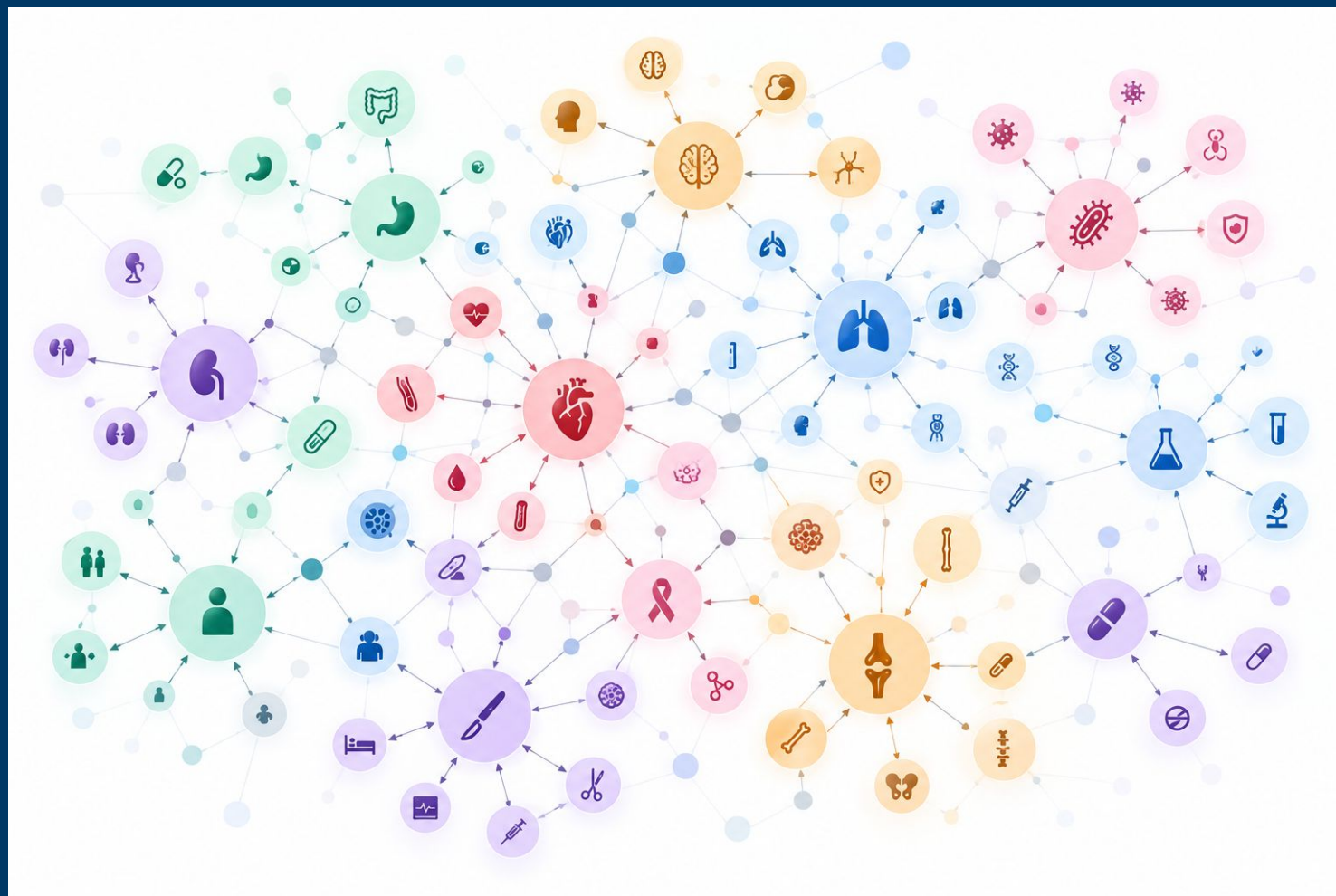
SNOMED CT is a structured, machine-readable way to record what happens in a clinical encounter, in the language clinicians actually use.



MORE THAN A CODE LIST

Other code systems give you labels and numbers. SNOMED CT gives expresses the meaning behind them, which is what intelligent decision support needs

Three parts to every clinical meaning



CONCEPT

One meaning, one identifier

Every clinical idea gets a numeric id that is never reused and never given another meaning

DESCRIPTIONS

Many ways to say it

A fully specified name, a preferred term, and as many synonyms as clinicians actually use

RELATIONSHIPS

Defining properties for each concept

IS A links to broader concepts, so a query for the parent finds every child beneath it. Attribute relationships specify additional defining properties

The record stores the id. Wording can change, be translated or be renamed without altering what was recorded.

Every concept has a computable definition

A concept is more than a label on a list. It is described to the system in terms of other concepts:

IS A



Ischaemic heart disease

FINDING SITE



Myocardium

ASSOCIATED MORPHOLOGY

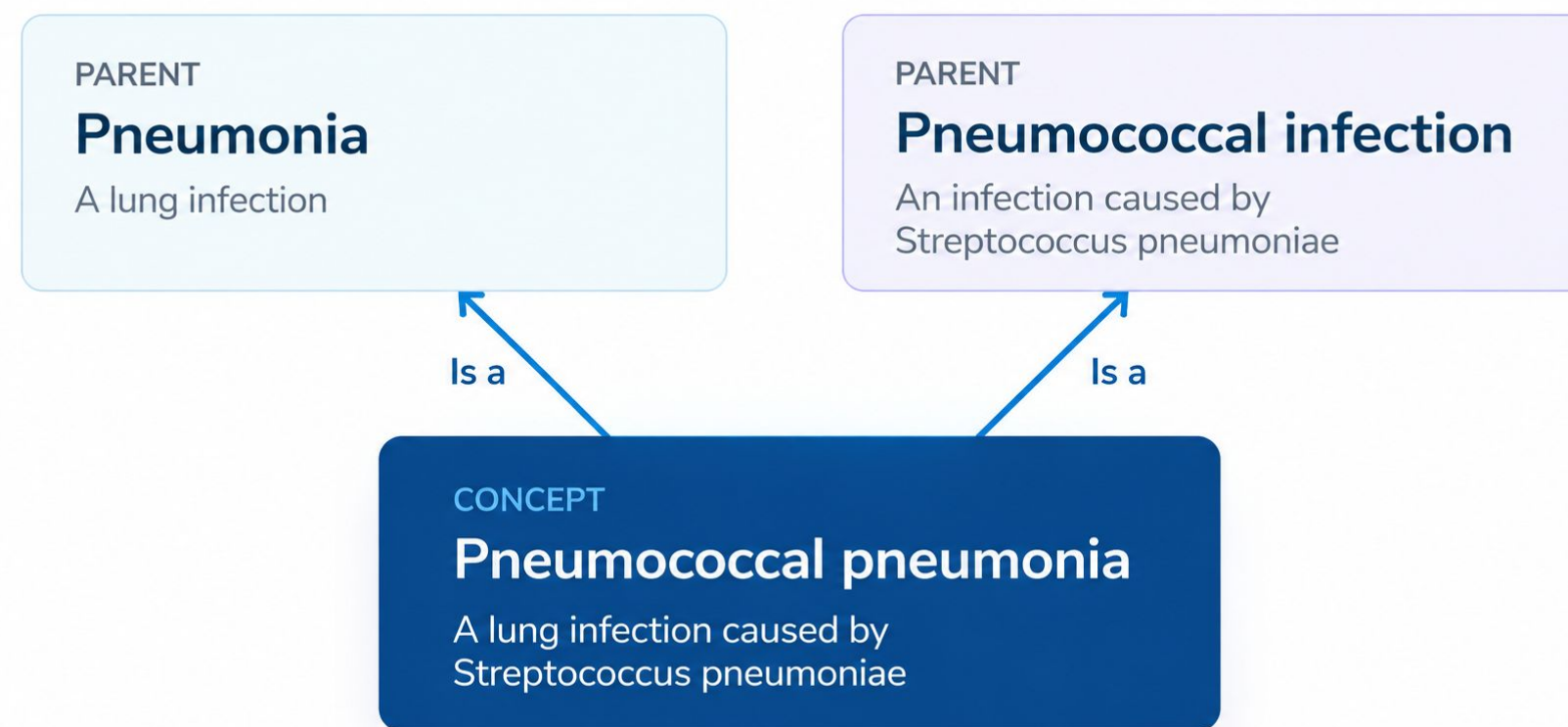


Infarct

A query for heart disease returns this case because the definition says so, not because someone remembered to add it to a list

A concept can have more than one parent

A concept can sit under more than one parent:
SNOMED CT is a polyhierarchy, not a strict tree



- A query for pneumonia returns this case. So does a query for pneumococcal infection
- Nobody has to decide in advance which branch the patient belongs in, or record them twice
- A classification cannot do this: its categories are designed to be mutually exclusive

More than conditions and procedures

SNOMED CT covers the information in and around a clinical record, not only the diagnosis and the operation:

WHAT WAS FOUND Myocardial infarction	WHAT WAS DONE Coronary angioplasty	WHERE IT WAS DONE Left anterior descending artery
WHAT WAS GIVEN Aspirin 75 mg tablet	WHAT WAS MEASURED Systolic blood pressure	WHAT WAS SAMPLED Venous blood specimen
WHAT CAUSED IT Streptococcus pneumoniae	WHAT WAS USED Coronary artery stent	THE CONTEXT AROUND IT Family history of diabetes

One concept model, many hierarchies

Every concept sits somewhere in a set of top-level hierarchies, including:

Clinical finding 	Procedure 	Body structure 	Organism 
Substance 	Pharmaceutical / biologic product 	Specimen 	Observable entity 
Physical object 	Event 	Situation with explicit context 	Social context 
Environment or geographical location 	Staging and scales 	Record artifact 	Qualifier value 

One concept, many terms

A single SNOMED CT concept links multiple clinical descriptions and synonyms to represent the same underlying meaning:

FSN (FULLY SPECIFIED NAME)

**Appendectomy
(procedure)**

PREFERRED TERM

Appendectomy

SYNONYM

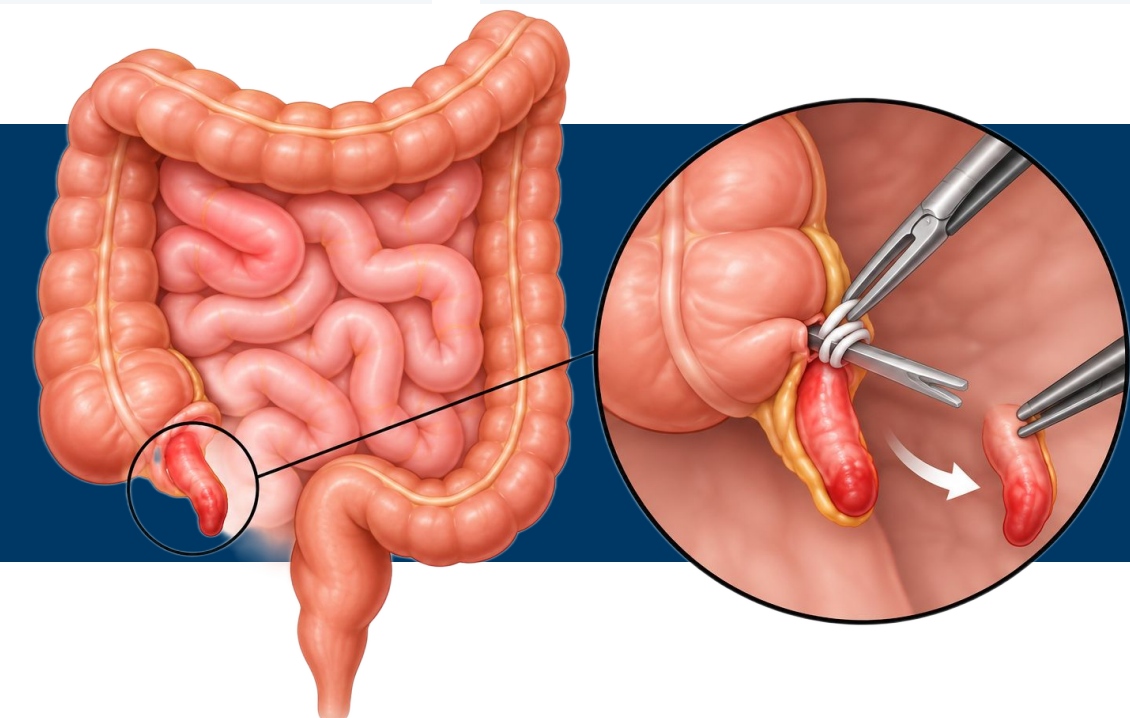
Excision of appendix

SYNONYM

Removal of
appendix

80146002

the same stored value in every one of those records



One concept, many languages

Descriptions are attached to the concept per language, maintained by each Member's release centre:

EN 

appendectomy

ES 

apendicectomía

NO 

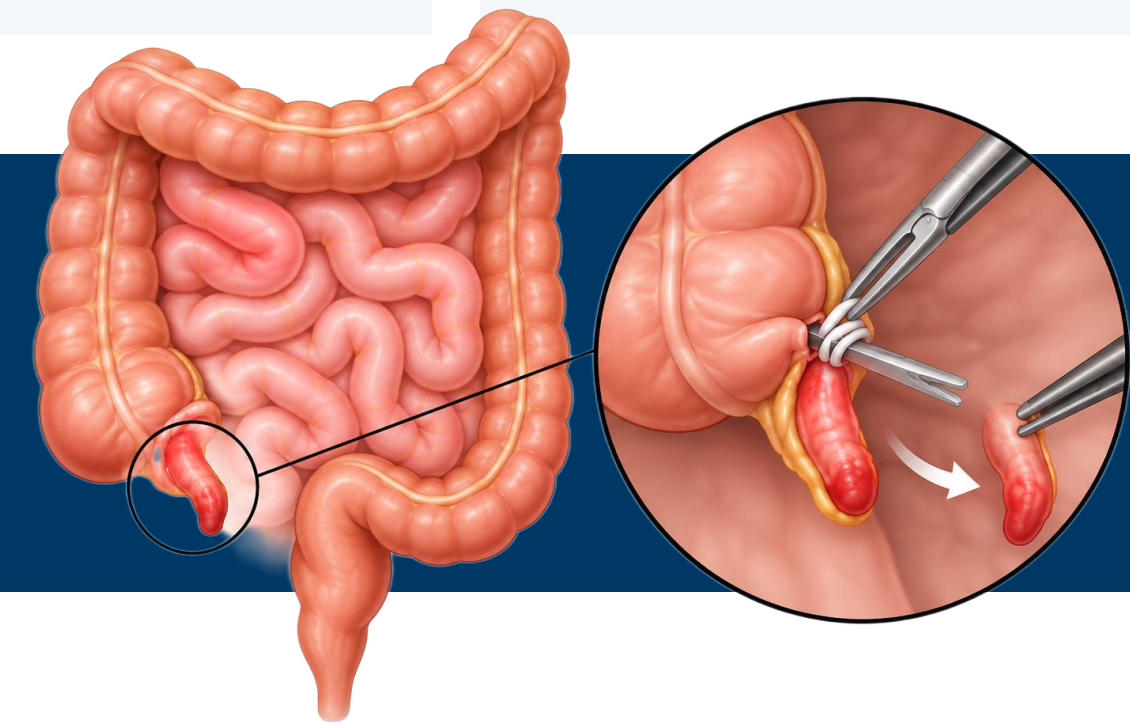
appendektomi

LV 

apendektomija

80146002

the same stored value in every one of those records



what the clinician sees

ADD TO PROBLEM LIST

Asthma

- Allergic asthma
- Exercise-induced asthma
- Asthma attack
- Childhood asthma

WHAT THE RECORD STORES

195967001

This clinician sees “Asthma”. A colleague in another country sees the word in their own language. It is the same number underneath.

SEVERITY	Moderate
CLINICAL STATUS	Active
ONSET	Childhood

One field for each idea, and every field uses SNOMED CT. The clinician just types and picks.

DEMONSTRATION

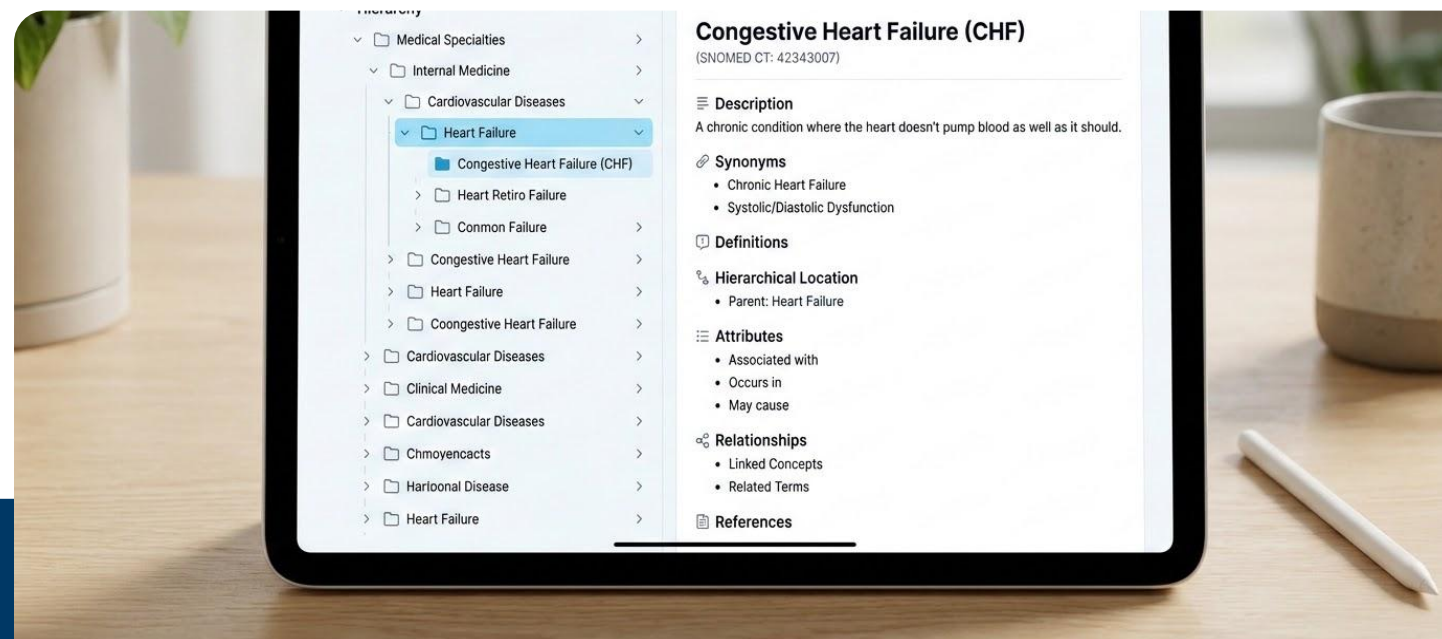
SNOMED CT in Action

01 · EXPLORATION & STRUCTURE

SNOMED CT Browser

Navigating clinical hierarchies, relationships, and concepts in real-time to inspect the underlying terminology engine.

<https://snomedbrowser.org/>

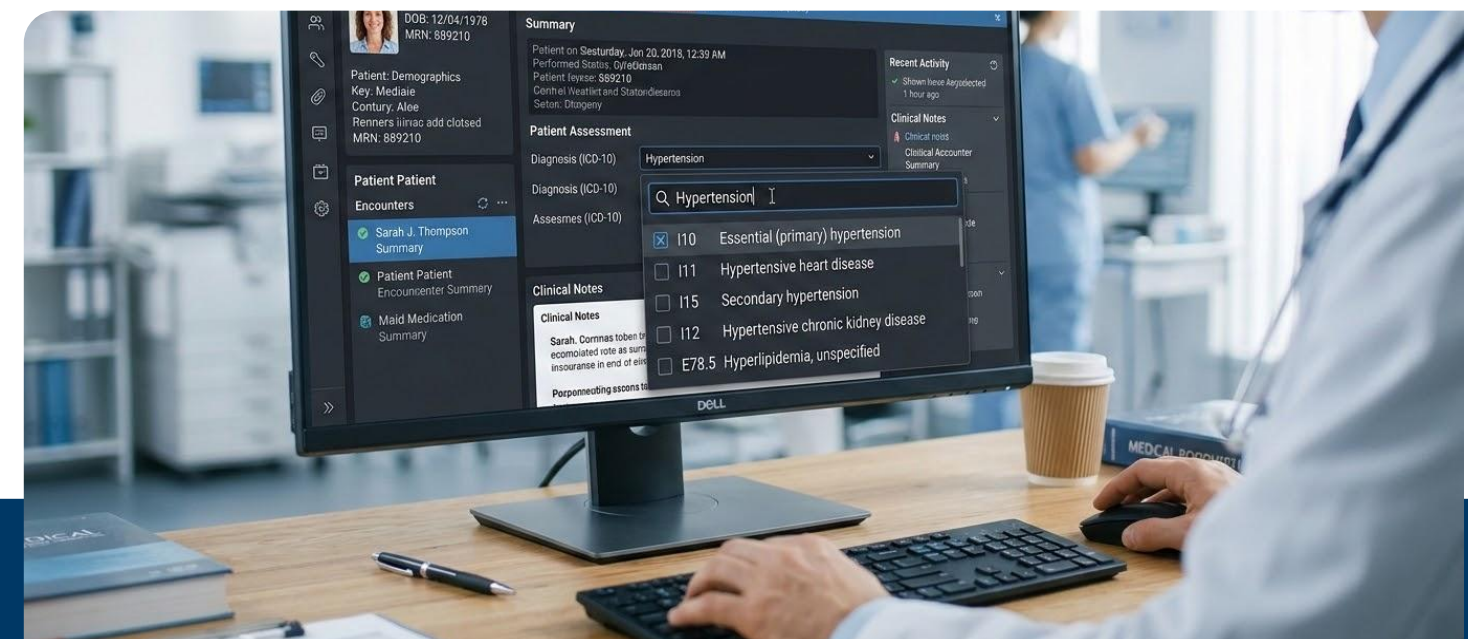


02 · CLINICAL WORKFLOW

User Interface Integration

Demonstrating point-of-care data entry, term searching, auto-complete, and seamless storage of structured clinical data.

<https://ihtsdo.github.io/sct-implementation-demonstrator/#/ehr-lab>



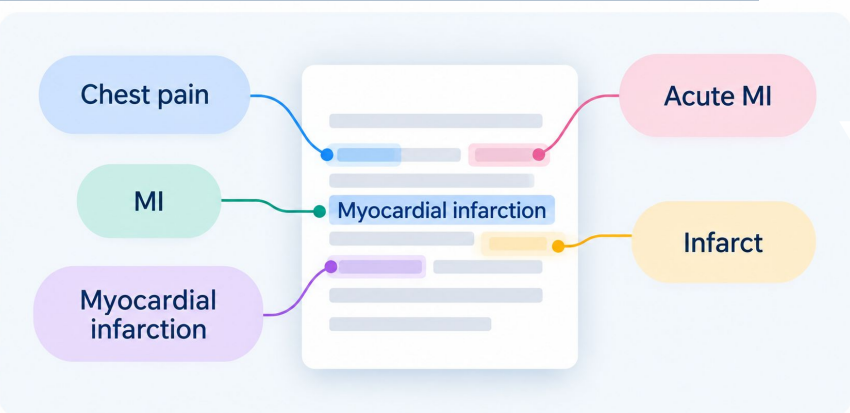
INTRODUCTION

Code Systems in Healthcare

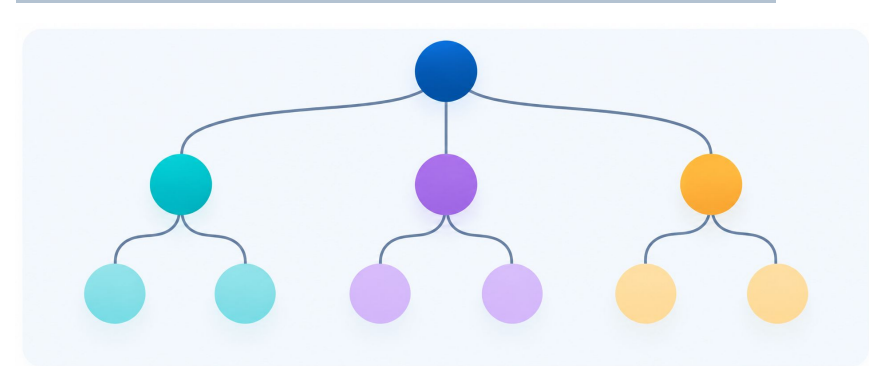
Terminology, classifications and groups

One record, several purposes

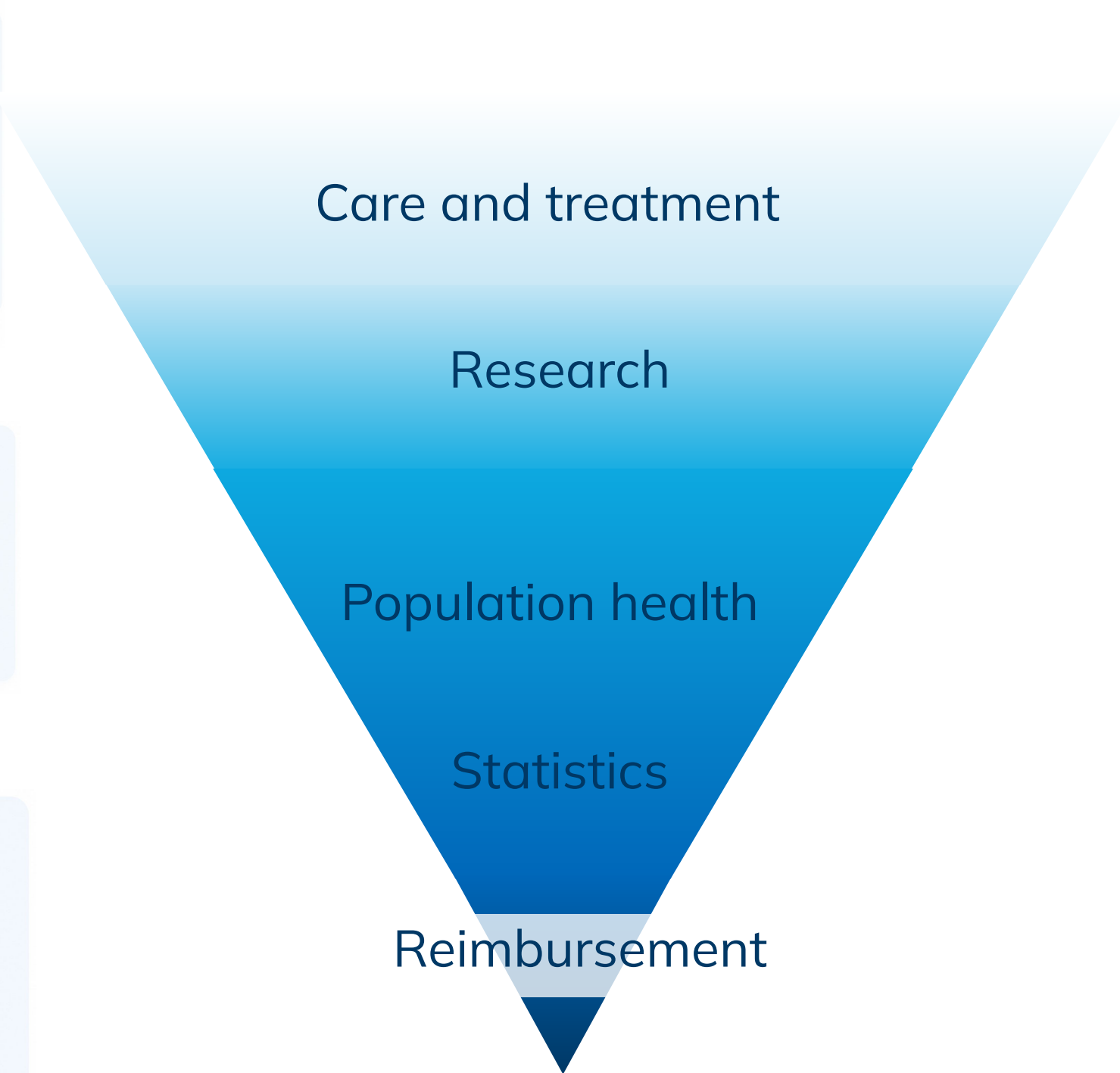
Clinical terms



Classifications



Groups



CLINICAL TERMINOLOGY

e.g. SNOMED CT, LOINC, MedDRA, Orphanet

CLASSIFICATION OF DISEASES

e.g. ICD-9, ICD-10

CLASSIFICATION OF PROCEDURES

e.g. ICHI, ICD-10-PCS

CLASSIFICATION OF ...

RESOURCE GROUPS

e.g. DRG, CPT, HCPCS

Terminology and classification solve different problems

Terminology, SNOMED CT

PURPOSE

Capture clinical detail as care happens

USED AT

The point of care, inside the clinical record

STRUCTURE

A polyhierarchy, a concept can have several parents

EXAMPLE

Myocardial infarction of anterior wall (disorder)

Classification, e.g. ICD-10 / ICD-11 MMS

PURPOSE

Group cases for statistics, funding and reporting

USED AT

The point of reporting, after the encounter

STRUCTURE

Exhaustive, largely mutually exclusive categories

EXAMPLE

I21.0, Acute transmural MI of anterior wall

Five patients, one category

A classification has to keep its categories few and stable so counts stay comparable over years. Grouping is not a flaw in it. It is the purpose.

WHAT THE CLINICIANS RECORDED

Severe persistent allergic asthma

Occupational asthma

Exercise induced asthma

Mild intermittent asthma

Aspirin induced asthma

ALL BECOME



IN THE NATIONAL RETURN

J45

Correct for counting asthma admissions. It can no longer tell you severe from mild, allergic from occupational, or which patients need a review.

The grouping is fine. The question is whether it happens to the report, or to the record.

detail can be reduced, never recovered

WORKS

Terminology in the record → map → classification for the return

The map is maintained centrally and applied by software. The clinical detail stays in the record and is still there next year.

DOES NOT WORK

Classification in the record → no way back to the clinical detail

The distinctions were never captured. No later processing, and no amount of analysis, can restore what was not recorded.

Three things that depend on it

- 01 Decision support.** Alerts and pathways fire on the specific concept, not on a category that covers five conditions.
- 02 Finding patients.** Cohorts for research, audit and recall depend on distinctions a classification has already discarded.
- 03 Questions not yet asked.** Tomorrow's question can only be answered by data that was detailed enough when it was recorded.

Record at terminology granularity. Derive the classification from it.

SNOMED CT can help answer clinical questions



Across chapters

“Which patients have any heart disorder?”

Find patients across related codes in one chapter.



By defining features

“Which conditions are caused by Streptococcus pyogenes?”

Search by attributes such as causative agent or finding site.



Full clinical detail

“How many patients have this specific rare disease?”

Get detailed results, including ‘other specified’ and ‘unspecified’.



Beyond diagnoses

“Who had an operation on the left kidney?”

Find procedures, body sites, organisms, substances and products.



Context and absence

“Who has no history of diabetes?”

Identify presence or absence using clinical context.



At any level

“All viral inflammatory disorders of the gut”

Search and analyse at any level of the SNOMED CT hierarchy.

SNOMED CT can help answer clinical questions

QUESTION

Any heart disorder

EXPRESSION CONSTRAINT LANGUAGE QUERY

```
<< 56265001 |Heart disease (disorder)|
```

QUESTION

Caused by *Streptococcus pyogenes*

EXPRESSION CONSTRAINT LANGUAGE QUERY

```
<< 64572001 |Disease| : 246075003 |Causative agent| = << 80166006  
|Streptococcus pyogenes|
```

QUESTION

Operation on the left kidney

EXPRESSION CONSTRAINT LANGUAGE QUERY

```
<< 71388002 |Procedure| : 405813007 |Procedure site - Direct| = << (64033007  
|Kidney structure| : 272741003 |Laterality| = 7771000 |Left|)
```

QUESTION

No history of diabetes

EXPRESSION CONSTRAINT LANGUAGE QUERY

```
<< 243796009 |Situation with explicit context| : { 246090004 |Associated  
finding| = << 73211009 |Diabetes mellitus|, 408729009 |Finding context| =  
410516002 |Known absent| }
```

Record once in SNOMED CT.
Use Classifications for statistics.

Classifications

One count per case, for international comparison, mortality and reimbursement.

SNOMED CT

Full clinical meaning, for care, decision support, research and cohort finding.

Maps

Link the two, so clinicians code once and statistics follow.



SNOMED
International

Thank You
Questions & Discussion