

# **SNOMED CT – Distributed Content Management**

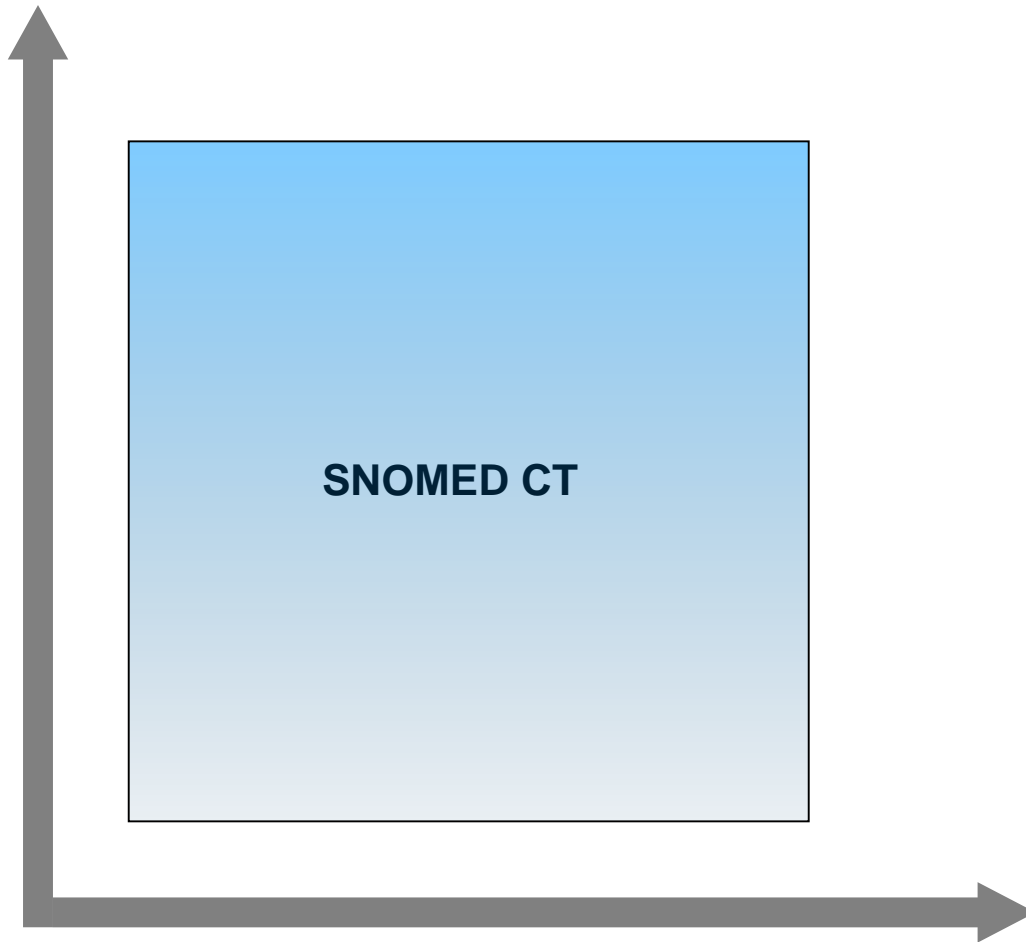
Stefan Schulz  
Content Committee  
April 2, 2009

# Problem statement

- SNOMED CT's size: barrier for effective content management and redesign
- Any action on SNOMED as a whole is a major undertaking
- Only a small fraction of this material has ever been used
- Concentration on quality-assured subset recommended

# SNOMED CT: Ontology + Vocabulary

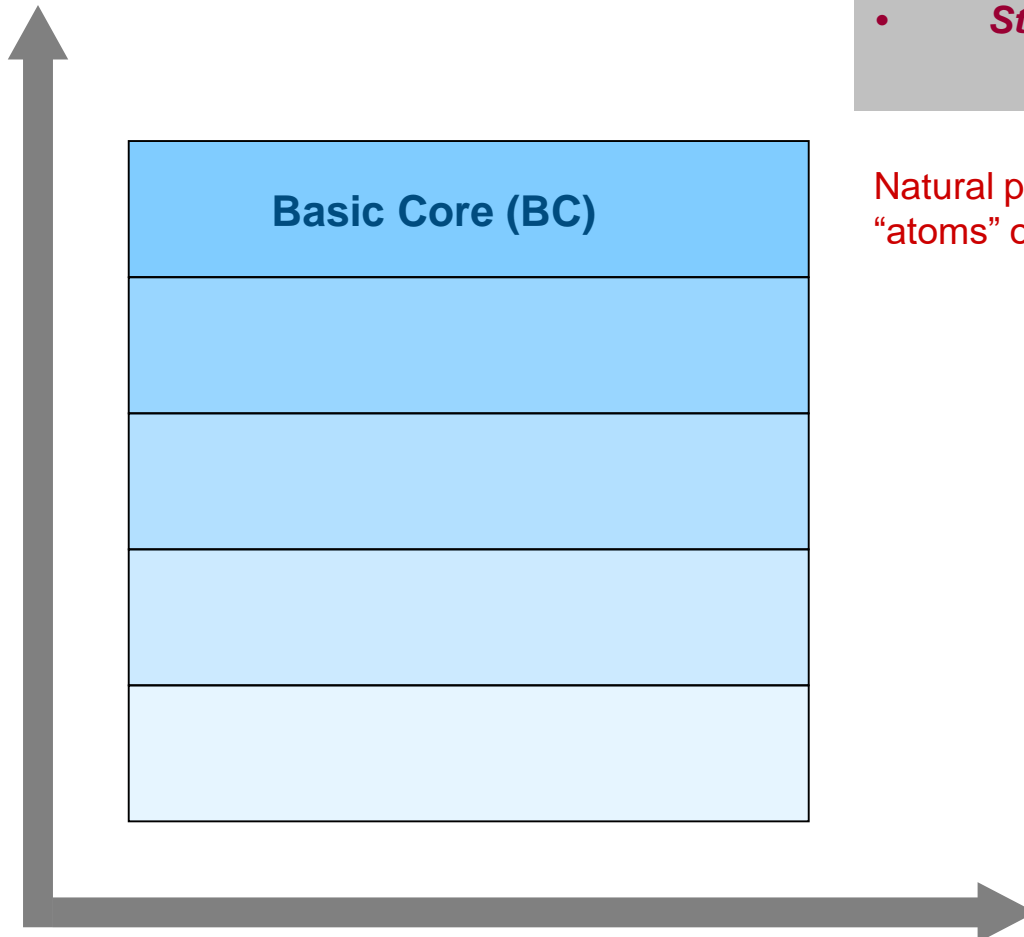
SNOMED – CT  
**Ontology**  
(concepts,  
relations)



SNOMED – CT  
**Vocabulary** (descriptions)

# SNOMED CT Ontology

SNOMED – CT  
**Ontology**  
(concepts,  
relations)



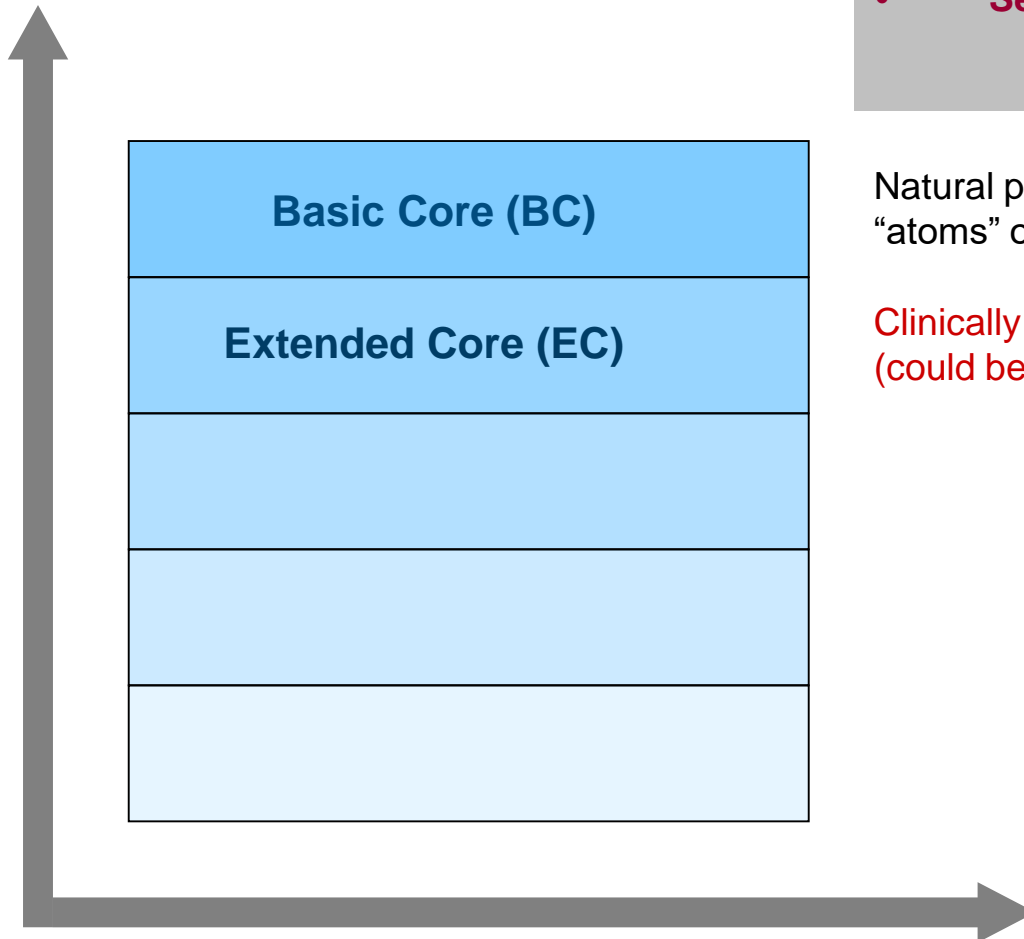
- *entire esophagus*
- *sarcoma*
- *L-carnitine*
- *Intensive care unit*
- *Stenosis*

Natural primitives constituting the conceptual “atoms” of the domain.

SNOMED – CT  
**Vocabulary** (descriptions)

# SNOMED CT Ontology

SNOMED – CT  
**Ontology**  
(concepts,  
relations)



- *esophagitis*
- *esophageal neoplasm*
- *entire left upper extremity*
- *Severe asthma*

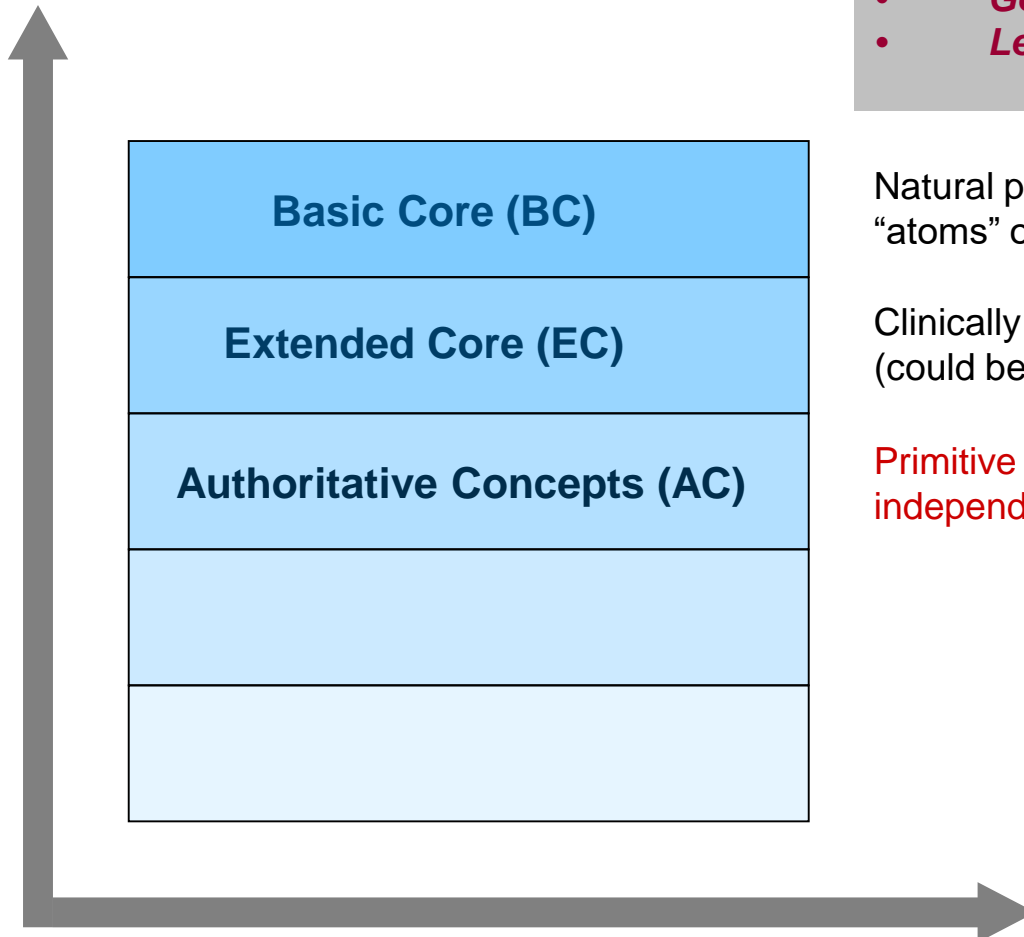
Natural primitives constituting the conceptual “atoms” of the domain.

Clinically relevant frequent concepts that are (could be) expressed by full definitions

SNOMED – CT  
**Vocabulary** (descriptions)

# SNOMED CT Ontology

SNOMED – CT  
**Ontology**  
(concepts,  
relations)



**Basic Core (BC)**

**Extended Core (EC)**

**Authoritative Concepts (AC)**

- *prednisolone 50 mg tablet*
- *L-Carnitine product*
- *nurse – RAF*
- *Georgia state*
- *Leishmania donovani*

Natural primitives constituting the conceptual “atoms” of the domain.

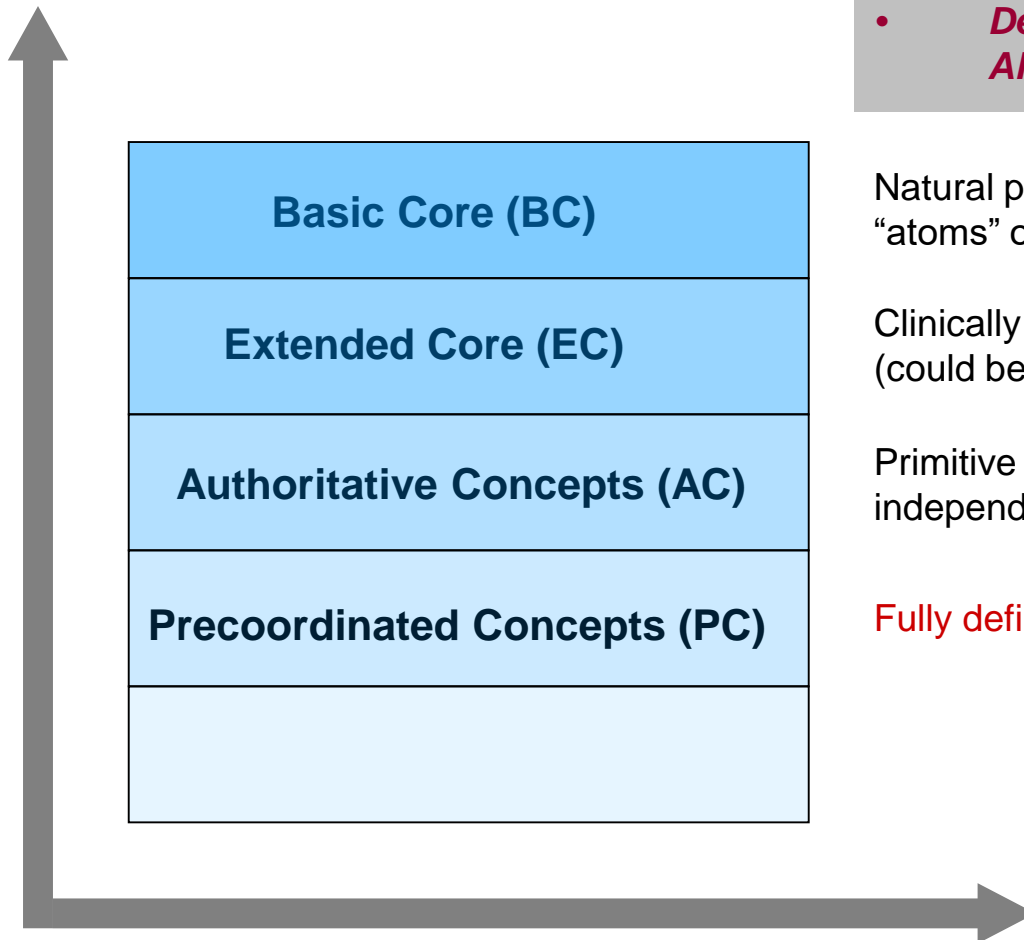
Clinically relevant frequent concepts that are (could be) expressed by full definitions

Primitive Concepts for which a SNOMED CT independent, authoritative source exists

SNOMED – CT  
**Vocabulary** (descriptions)

# SNOMED CT Ontology

SNOMED – CT  
**Ontology**  
(concepts,  
relations)



- *Abrasion AND/OR friction burn of ear with infection,*
- *Injection of triamnicolone into nail bed,*
- *Deep third degree burn of forehead AND/OR cheek with loss of body part*

Natural primitives constituting the conceptual “atoms” of the domain.

Clinically relevant frequent concepts that are (could be) expressed by full definitions

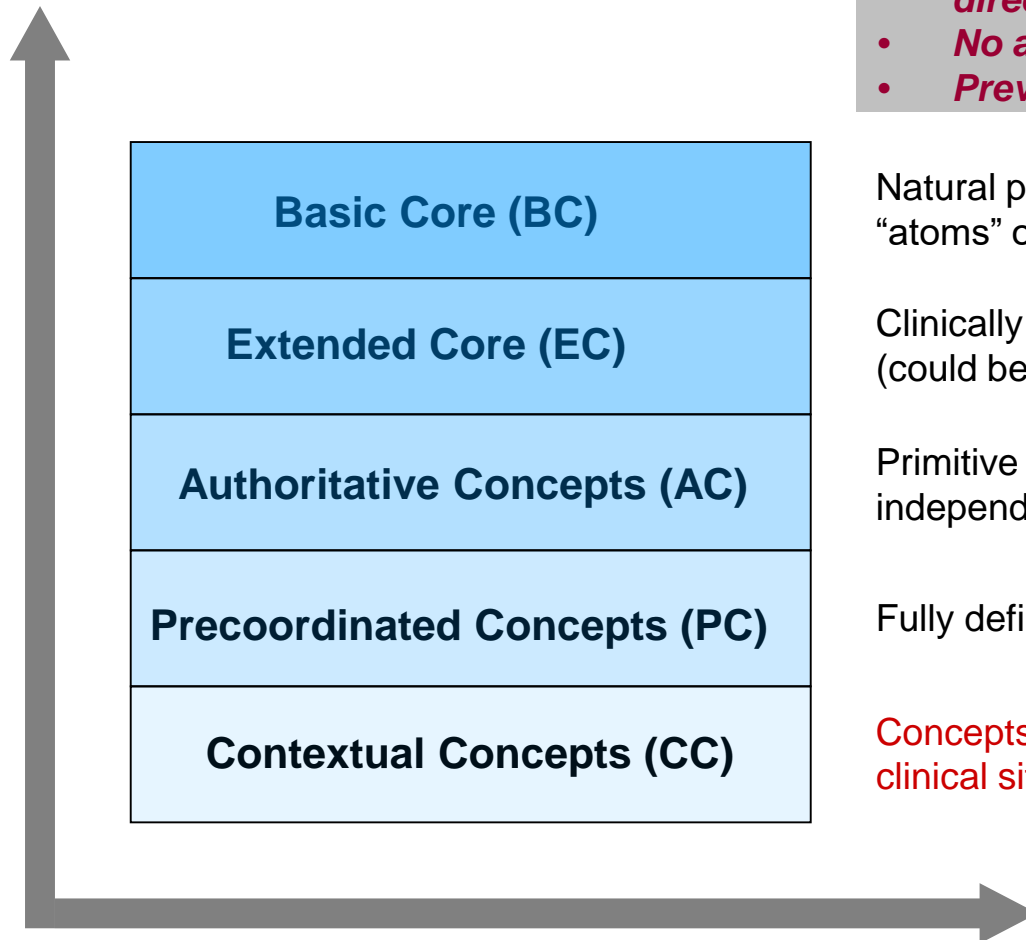
Primitive Concepts for which a SNOMED CT independent, authoritative source exists

Fully defined but idiosyncratic concepts

SNOMED – CT  
**Vocabulary** (descriptions)

# SNOMED CT Ontology

SNOMED – CT  
**Ontology**  
(concepts,  
relations)



**Basic Core (BC)**

**Extended Core (EC)**

**Authoritative Concepts (AC)**

**Precoordinated Concepts (PC)**

**Contextual Concepts (CC)**

- *implementation of planned interventions*
- *Take at regular intervals. Complete the prescribed course unless otherwise directed*
- *No antenatal care: not known pregnant*
- *Previous known suicide attempt*

Natural primitives constituting the conceptual “atoms” of the domain.

Clinically relevant frequent concepts that are (could be) expressed by full definitions

Primitive Concepts for which a SNOMED CT independent, authoritative source exists

Fully defined but idiosyncratic concepts

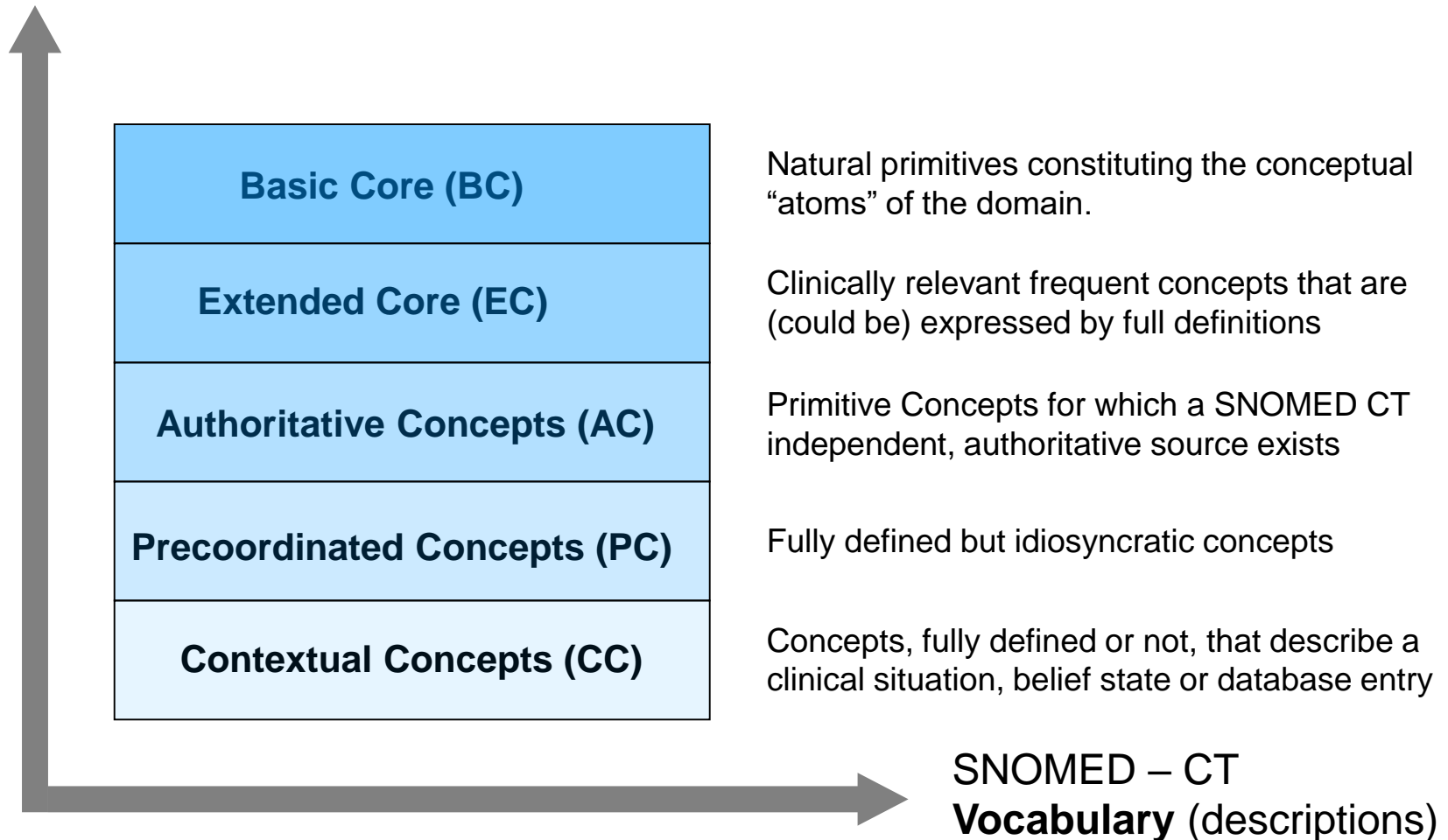
Concepts, fully defined or not, that describe a clinical situation, belief state or database entry

SNOMED – CT  
**Vocabulary** (descriptions)



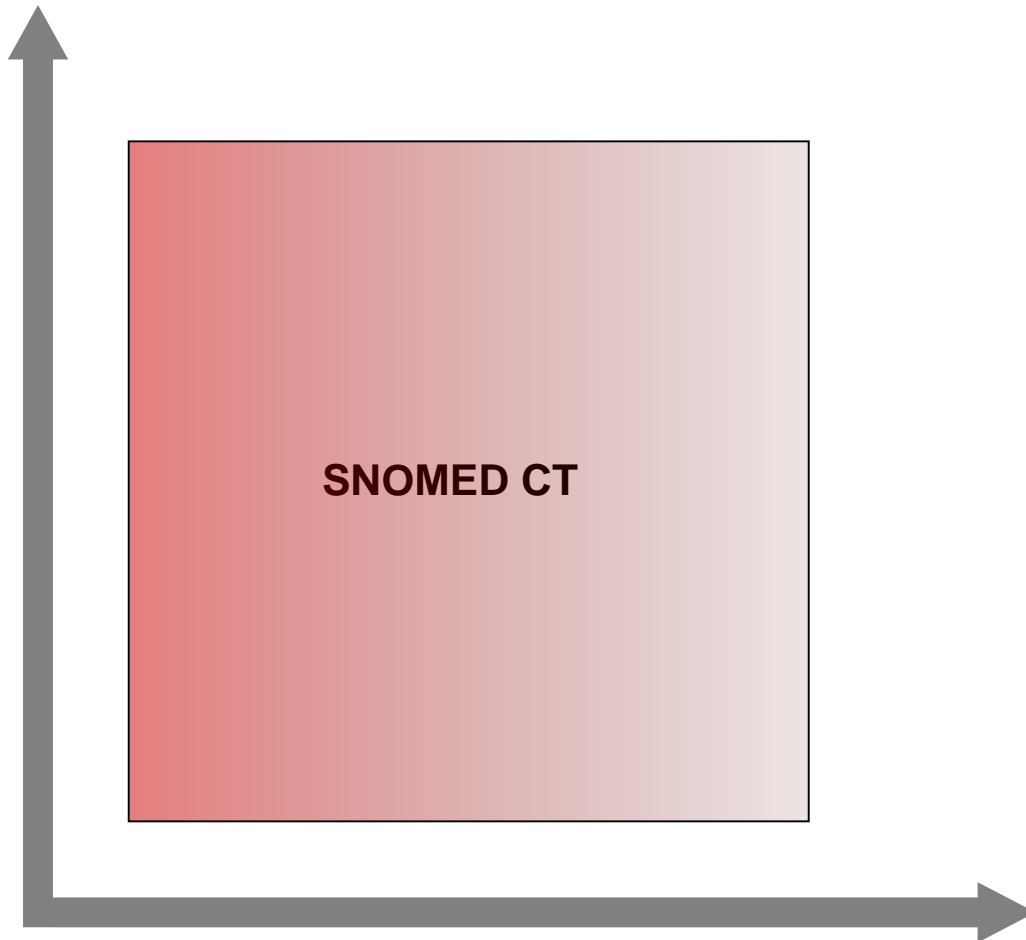
# SNOMED CT Ontology

SNOMED – CT  
**Ontology**  
(concepts,  
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# SNOMED CT: Ontology + Vocabulary

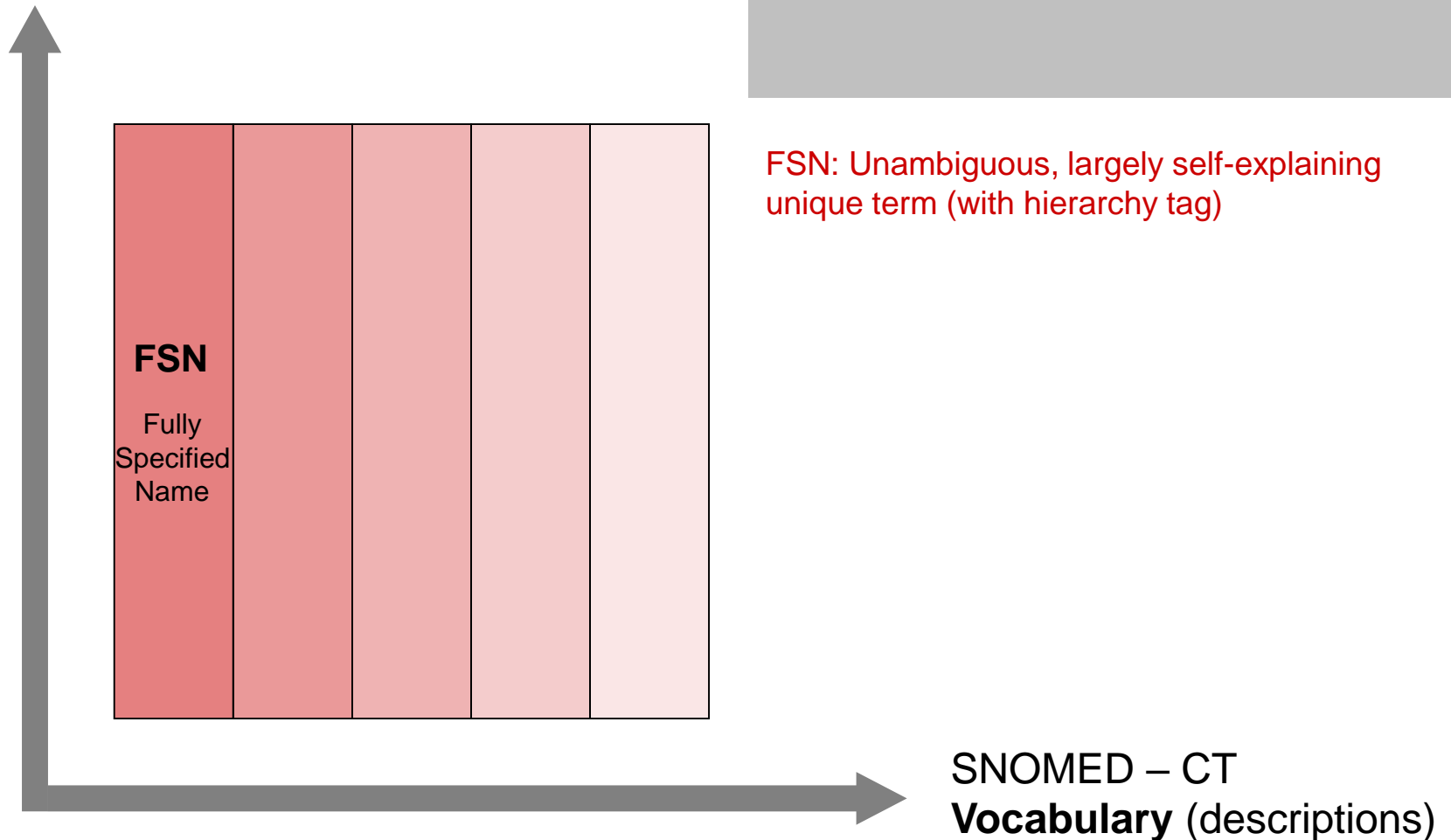
SNOMED – CT  
**Ontology**  
(concepts,  
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SNOMED – CT  
**Vocabulary** (descriptions)

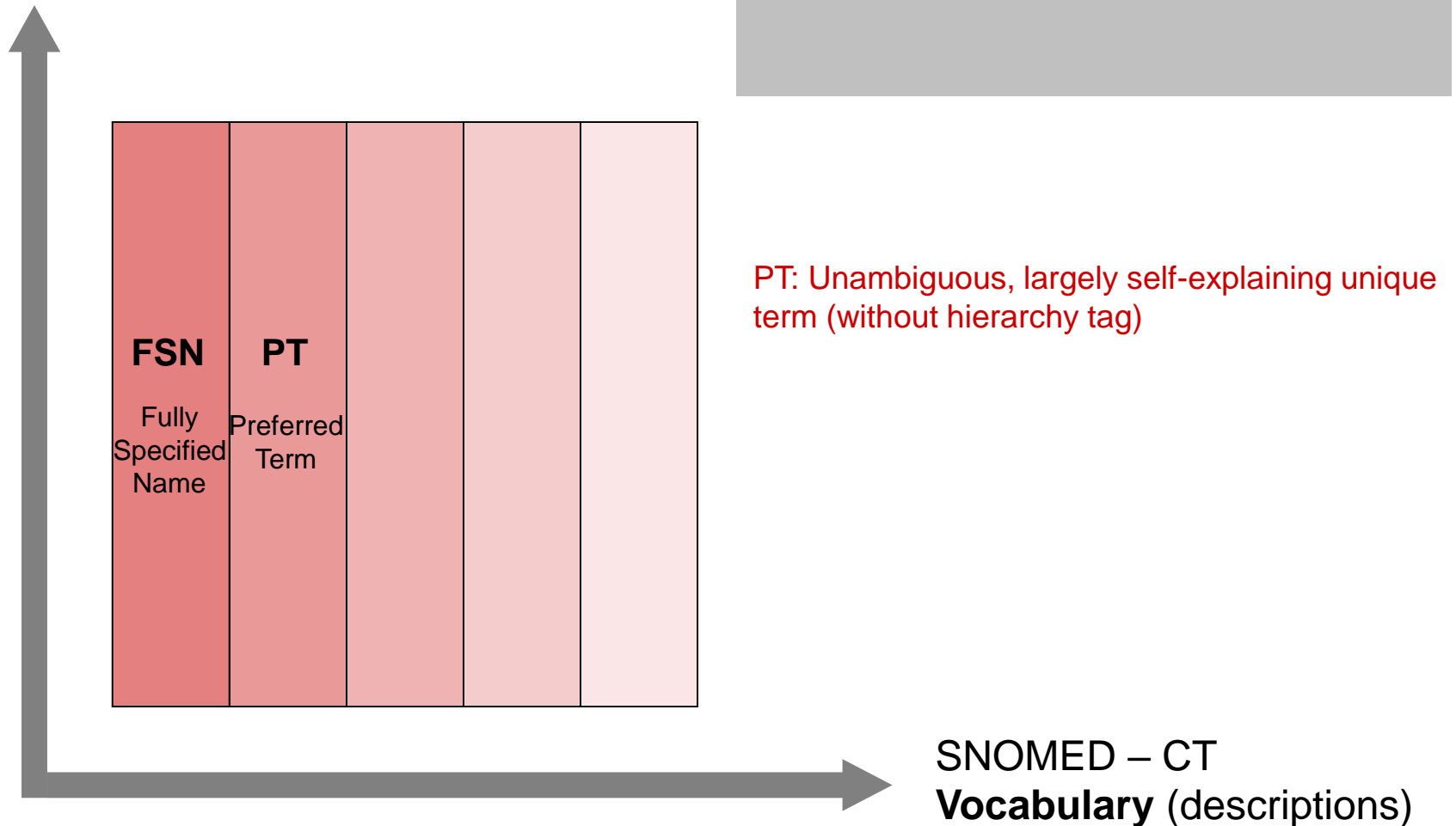
# SNOMED CT: Vocabulary

- *"malignant tumor of esophagus (disorder)"*



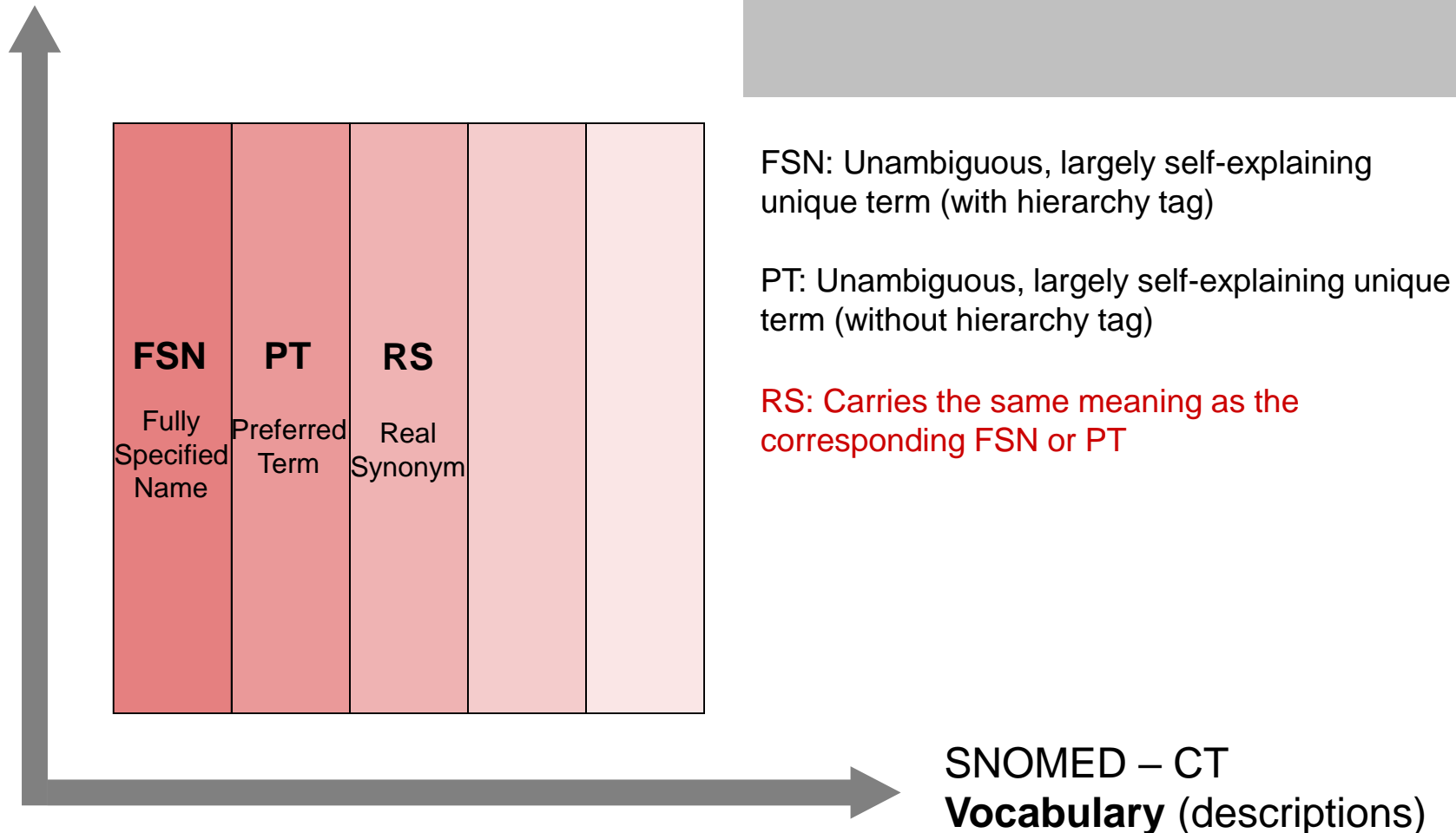
# SNOMED CT: Vocabulary

- *"malignant tumor of esophagus"*



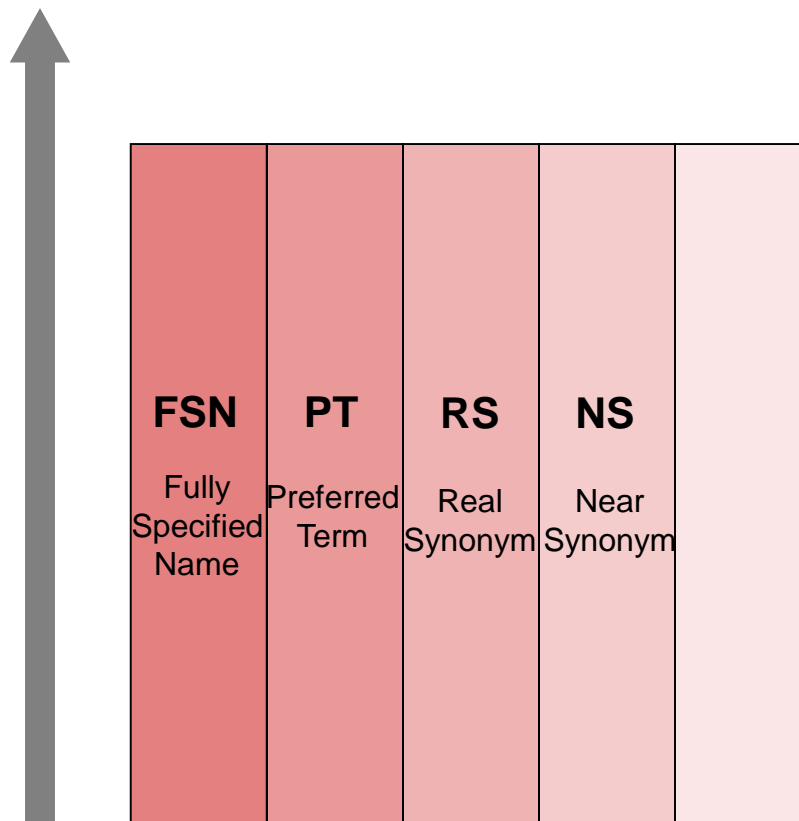
# SNOMED CT: Vocabulary

- *“esophageal carcinoma”*



# SNOMED CT: Vocabulary

- *“foot” (body part vs. length unit),*
- *“fundus” for “uterine fundus”*
- *“appendectomy” for „open appendectomy“*



FSN: Unambiguous, largely self-explaining unique term (with hierarchy tag)

PT: Unambiguous, largely self-explaining unique term (without hierarchy tag)

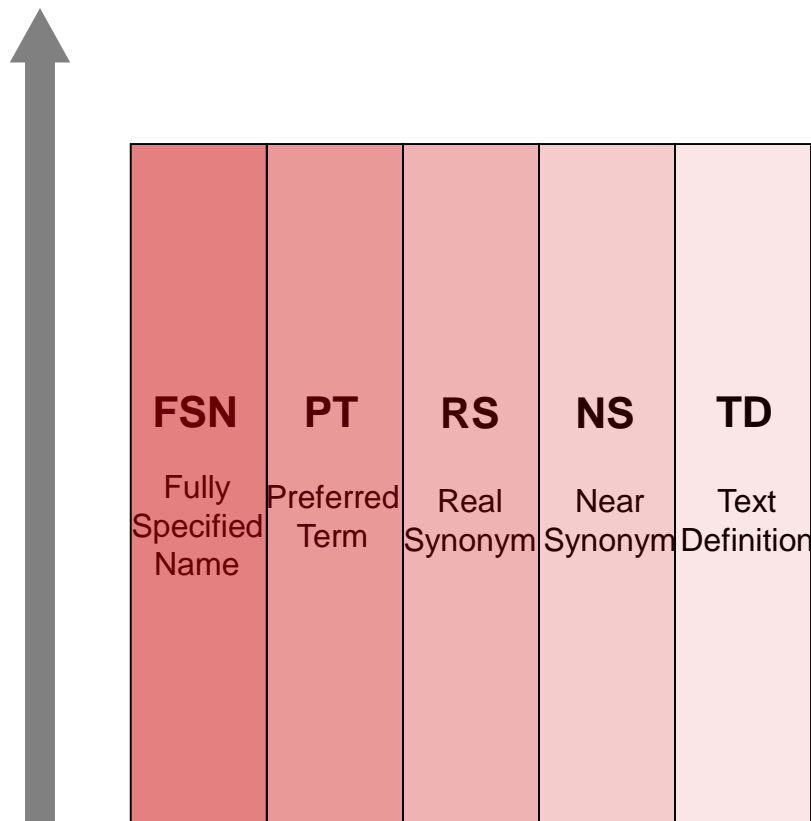
RS: Carries the same meaning as the corresponding FSN or PT

NS: term with a broader meaning, but in many contexts used as synonym to the related FSN

SNOMED – CT  
**Vocabulary** (descriptions)

# SNOMED CT: Vocabulary

- *“Intertrigo (disorder) - Superficial dermatitis on opposed skin surfaces”*



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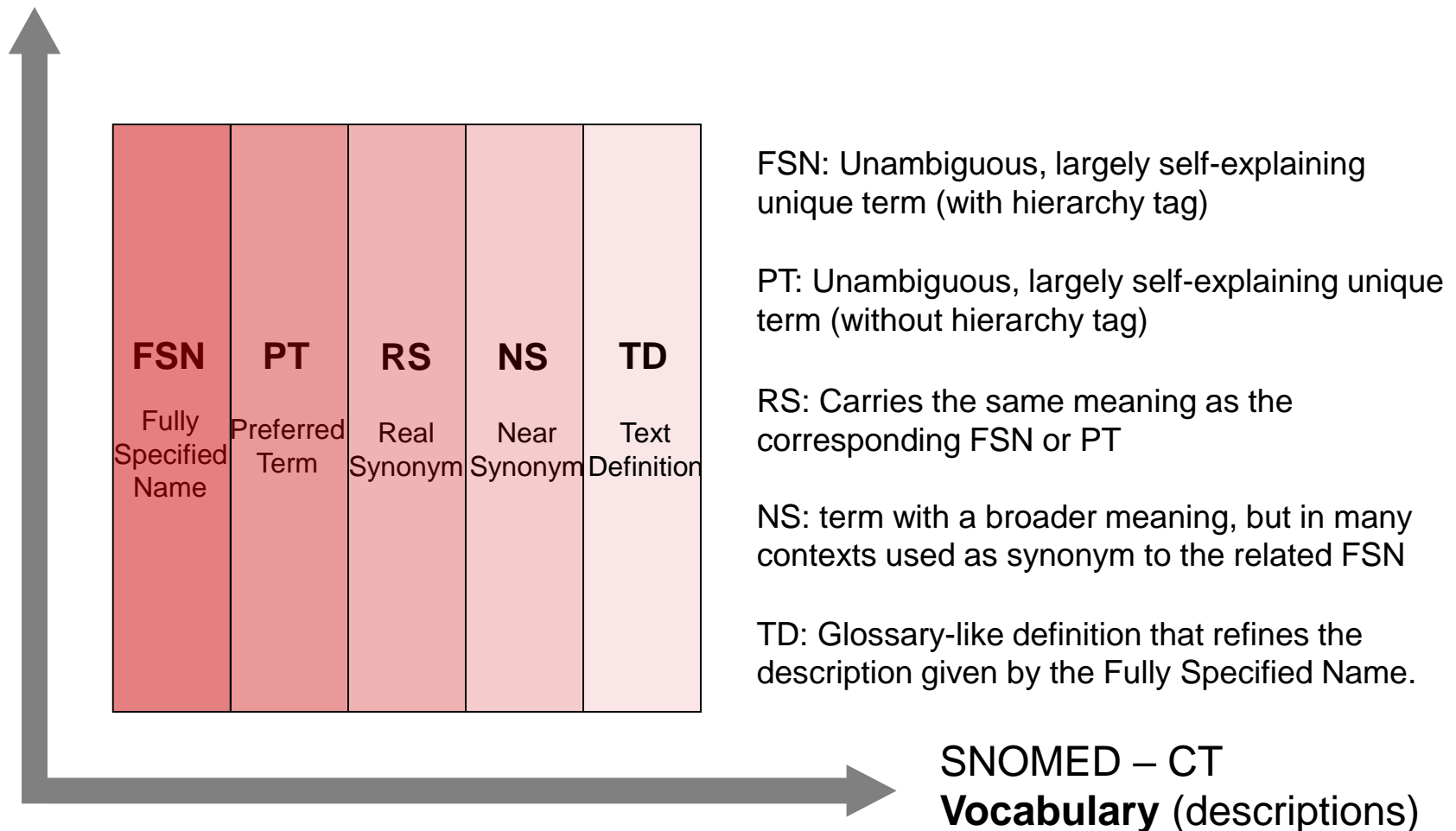
RS: Carries the same meaning as the corresponding FSN or PT

NS: term with a broader meaning, but in many contexts used as synonym to the related FSN

TD: Glossary-like definition that refines the description given by the Fully Specified Name.

SNOMED – CT  
**Vocabulary** (descriptions)

# SNOMED CT: Vocabulary





# SNOMED CT: Vocabulary \* Ontology

**SNOMED Ontology**  
(concepts, relations)

BC: Natural primitives constituting the conceptual “atoms” of the domain.  
AC: Primitive Concepts for which a SNOMED CT independent, authoritative source exists

EC: Clinically relevant frequent concepts that are (could be) expressed by full definitions

PC: Fully defined but idiosyncratic concepts

CC: Concepts, fully defined or not, that describe a clinical situation, belief state or database entry

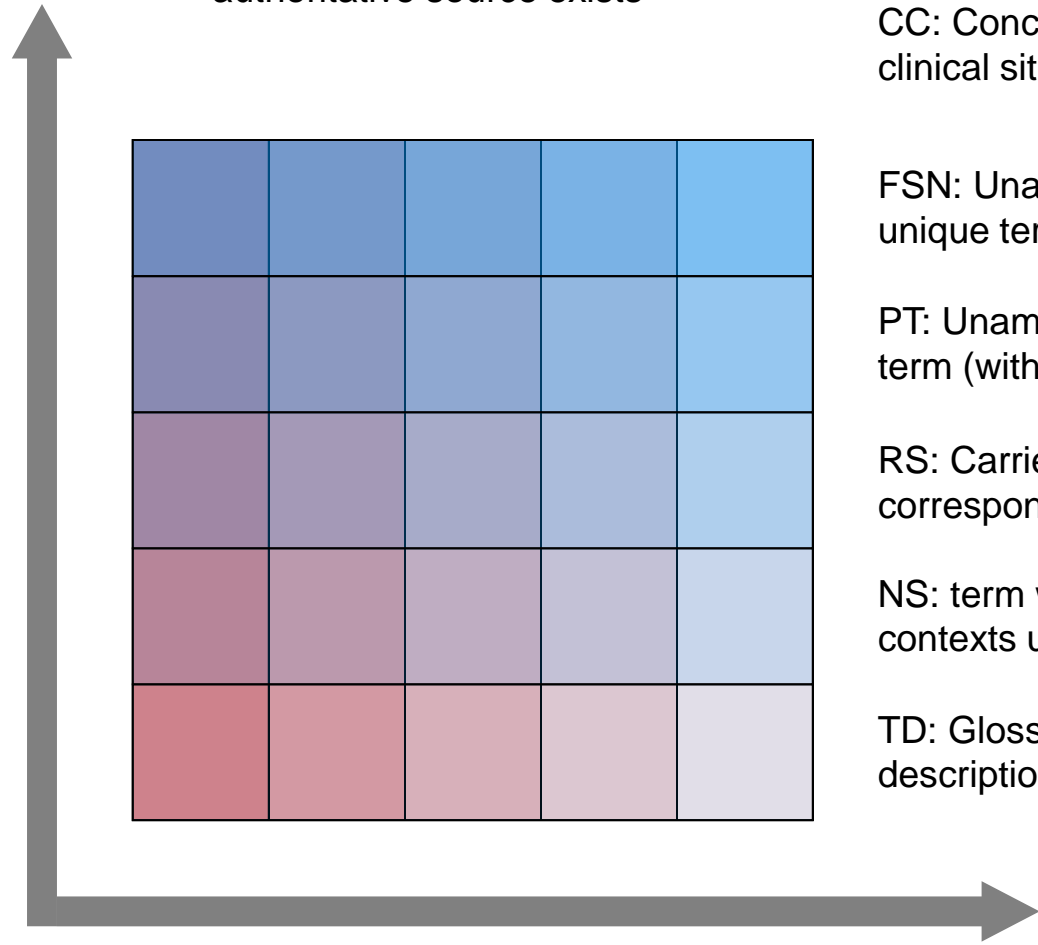
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**SNOMED – CT Vocabulary** (descriptions)

# SNOMED CT: Language Dimension

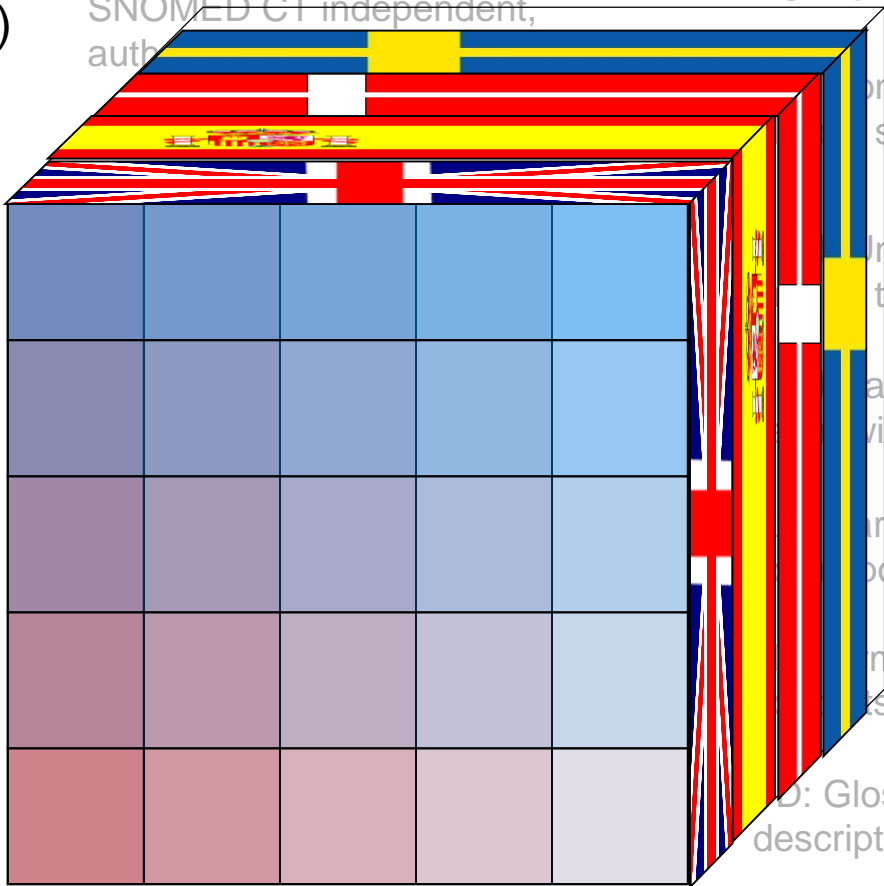
**SNOMED  
Ontology**  
(concepts,  
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BC: Natural primitives constituting the conceptual "atoms" of the domain.

EC: Clinically relevant frequent concepts that are (could be) expressed by full definitions

AC: Primitive Concepts for which a SNOMED CT independent, author

PC: Fully defined but idiosyncratic concepts



concepts, fully defined or not, that describe a situation, belief state or database entry

Unambiguous, largely self-explaining term (with hierarchy tag)

Ambiguous, largely self-explaining unique (without hierarchy tag)

Carries the same meaning as the corresponding FSN or PT

Term with a broader meaning, but in many cases used as synonym to the related FSN

EC: Glossary-like definition that refines the description given by the Fully Specified Name.

**SNOMED – CT  
Vocabulary (descriptions)**

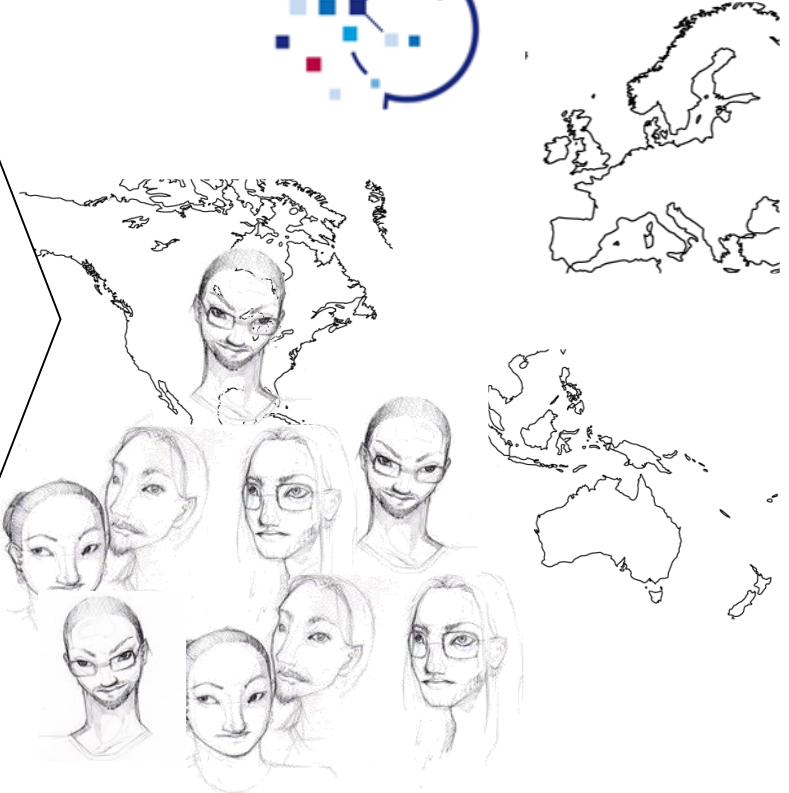
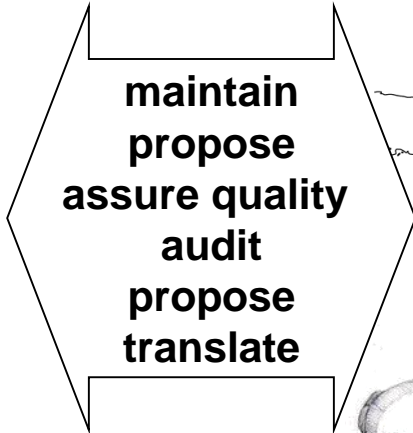
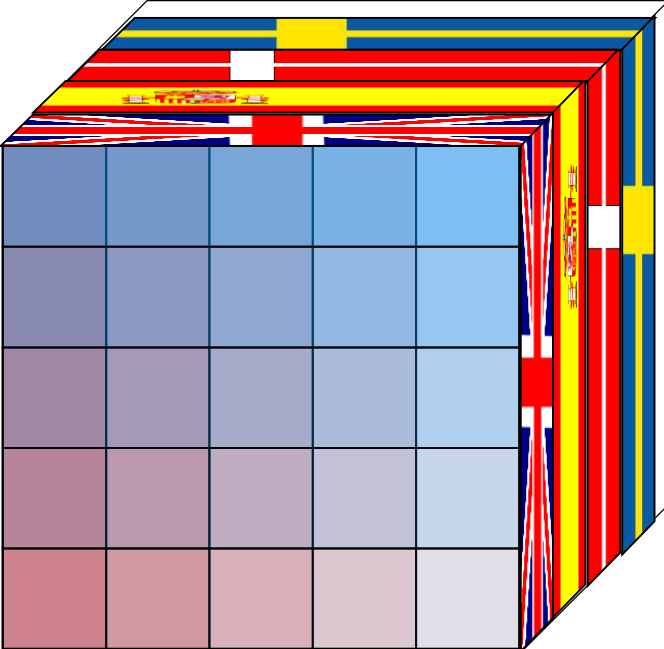
# Stakeholders and Roles

## SNOMED CT

- Ontology
- Terms

## IHTSDO

- National Release Centers
- Affiliates
- User Groups
- Other SDOs



# Possible Distributed Management

	SNOMED CT Concepts					SNOMED CT descriptions				
	BC	EC	AC	PC	CC	FSN	PT	RS	TD	NS
IHTSDO	fully maintain	fully maintain	define sources, manage IDs	audit quality assessment	audit quality assessment	fully maintain (english)	fully maintain (english)	fully maintain (english)	fully maintain	audit (english)
National Release Centers	quality assessment	quality assessment	translate	propose maintain	propose maintain	maintain (other)	maintain (others)	maintain (others)	translate (?)	audit (others)
External authoritative sources			provide names, meaning, and IDs							
User groups				propose maintain	propose maintain					propose maintain
...										

## Consequences:

- “outsourcing” of many pre-coordinated concepts and synonyms: under the responsibility of user groups.
- IHTSDO’s role: audit and quality assurance.
- IHTSDO mostly concentrates on BC and EC
- Use of IDs from external namespaces

# Example 1

- Now:
  - user proposes a new concept C
  - IHTSDO processes request
  - IHTSDO finds concept definition
  - IHTSDO includes C into new SNOMED release
- Future
  - user proposes a new concept C
  - user uploads to common repository
  - users discuss suitable definition
  - IHTSDO approves FSN and formal definition
  - IHTSDO decides whether to leave in repository or include in terminology

# Example 2

- Now:
  - National Release Center translates concept C
- Future
  - user proposes a translation to concept C
  - user uploads proposal to common repository
  - users discuss
  - National Release Center approves translation

# Open issues

- tooling
- management of identifiers, namespaces etc.
- intellectual property issues
- workflows
- quality control
- referential integrity
- ...

