An ontology for ICPC-3 ?

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My interests :

- Decision support : EBM practice net.be
- Multidisciplinary EHR : Pricare.be
- Public health, data collection : maisonmedicale.org
- ICPC
- Snomed-CT

1. Some lacks in interface terminology
2. The example of Snomed-CT
3. Building blocks needed for an EHR
4. Existing material for creating primary care and ICPC rules

Some lacks in interface terminology

Thesauri/ vocabularies are present (belgian thesaurus, local thesaurus…) and somehow used.

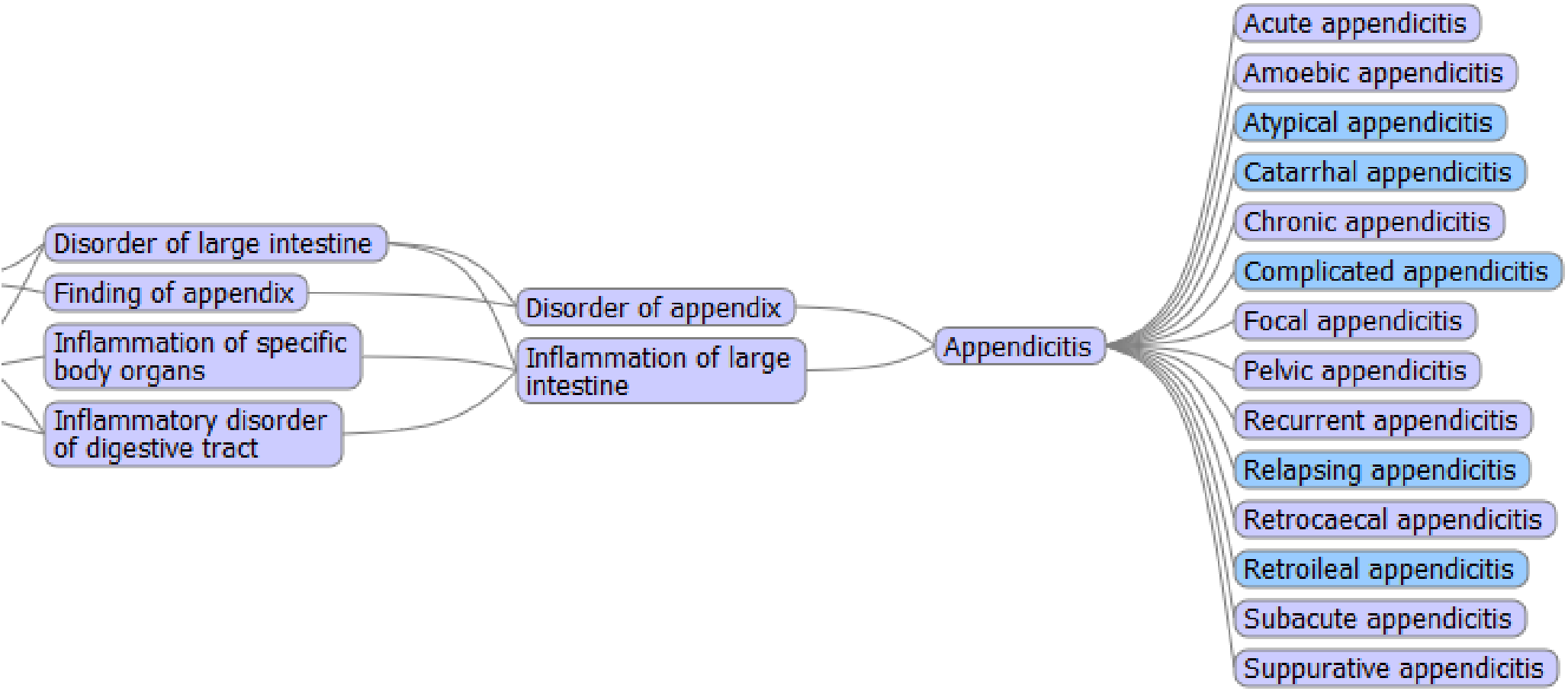
BUT, *no tools* to maintain them (no terminology server), to analyse there utilization, to update them, lack of informatic skills to implement them… just tireness to work on 50.000 lines Excel sheet !

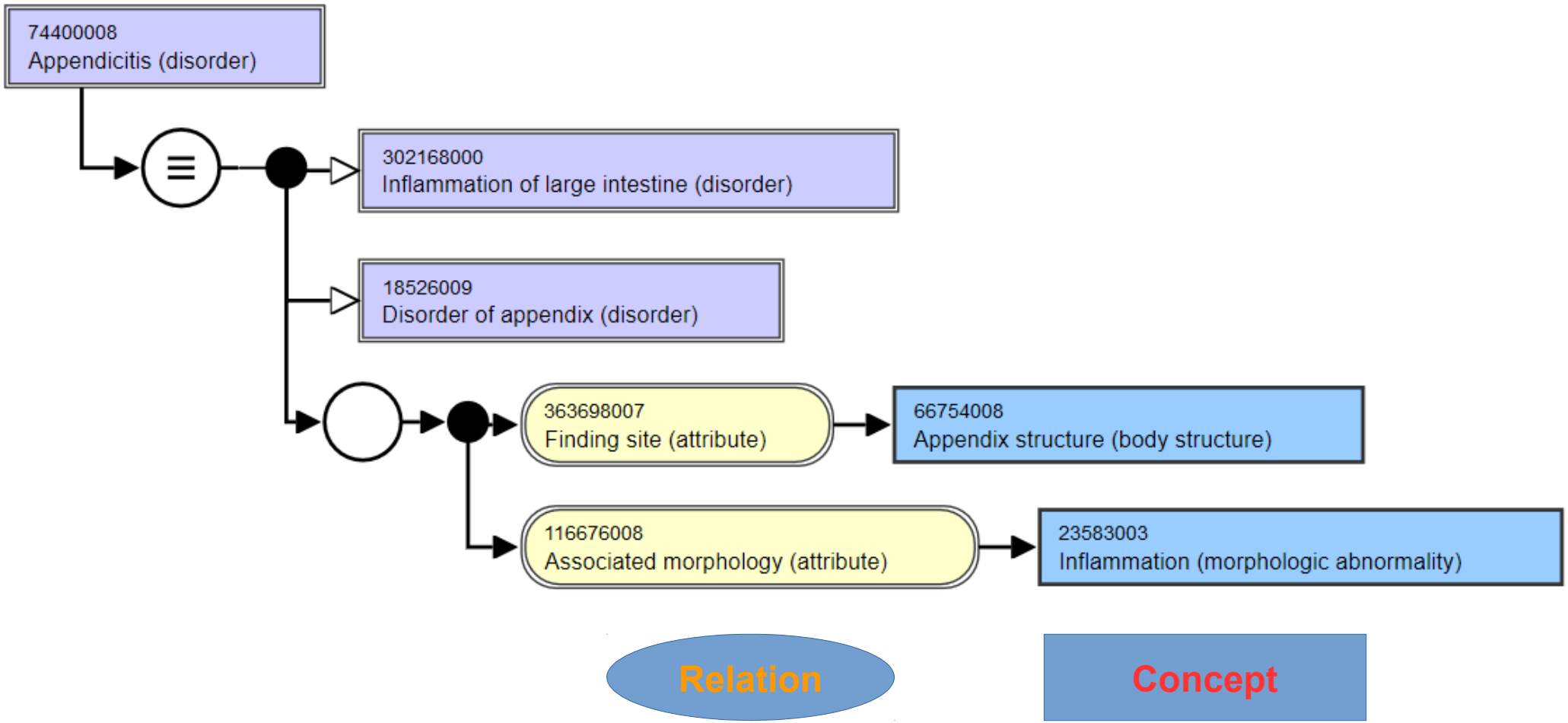
Today the structure of these thesauri are *outdated* comparing to new technical database standards : **medical knowledge evolve but IT technology also ! → knowledge management**

The example of snomed-CT

74400008 Appendicitis (disorder) | Parents : 2 Enfants : 14				
Classe	Relation	Extra	Nom	
cisp2e		- INT	Appendicite	D88
snomed	is a	->	Disorder of appendix (disorder)	18526009
snomed	is a	->	Inflammation of large intestine (disorder)	302168000
snomed	associated morphology	->	Inflammation (morphologic abnormality)	23583003
snomed	finding site	->	Appendix structure (body structure)	66754008
snomed	is a	<-	Atypical appendicitis (disorder)	5596004
snomed	is a	<-	Recurrent appendicitis (disorder)	67365005
snomed	is a	<-	Relapsing appendicitis (disorder)	6503008
snomed	is a	<-	Chronic appendicitis (disorder)	58997001

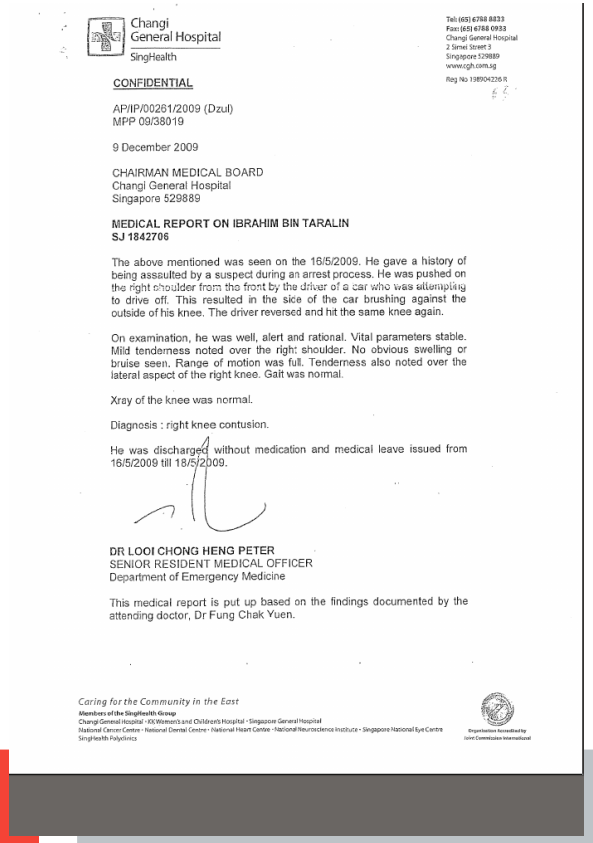
« Is a » relations




74400008
Appendicitis (disorder)
≡
302168000
Inflammation of large intestine (disorder)
18526009
Disorder of appendix (disorder)
363698007
Finding site (attribute)
66754008
Appendix structure (body structure)
116676008
Associated morphology (attribute)
23583003
Inflammation (morphologic abnormality)
Relation
Concept

Imediate project 2014-2017

- Involving hospital and GP
- Extracting problems from medical document free text
-



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AP/IP/00261/2009 (Dzul)
MPP 09/38019

9 December 2009

CHAIRMAN MEDICAL BOARD
Changi General Hospital
Singapore 529889

MEDICAL REPORT ON IBRAHIM BIN TARALIN
SJ 1842706

The above mentioned was seen on the 16/5/2009. He gave a history of being assaulted by a suspect during an arrest process. He was pushed on the right shoulder from the front by the driver of a car who was attempting to drive off. This resulted in the side of the car brushing against the outside of his knee. The driver reversed and hit the same knee again.

On examination, he was well, alert and rational. Vital parameters stable. Mild tenderness noted over the right shoulder. No obvious swelling or bruise seen. Range of motion was full. Tenderness also noted over the lateral aspect of the right knee. Gait was normal.

Xray of the knee was normal.

Diagnosis : right knee contusion.

He was discharged without medication and medical leave issued from 16/5/2009 till 18/5/2009.

DR LOOI CHONG HENG PETER
SENIOR RESIDENT MEDICAL OFFICER
Department of Emergency Medicine

This medical report is put up based on the findings documented by the attending doctor, Dr Fung Chak Yuen.

Caring for the Community in the East

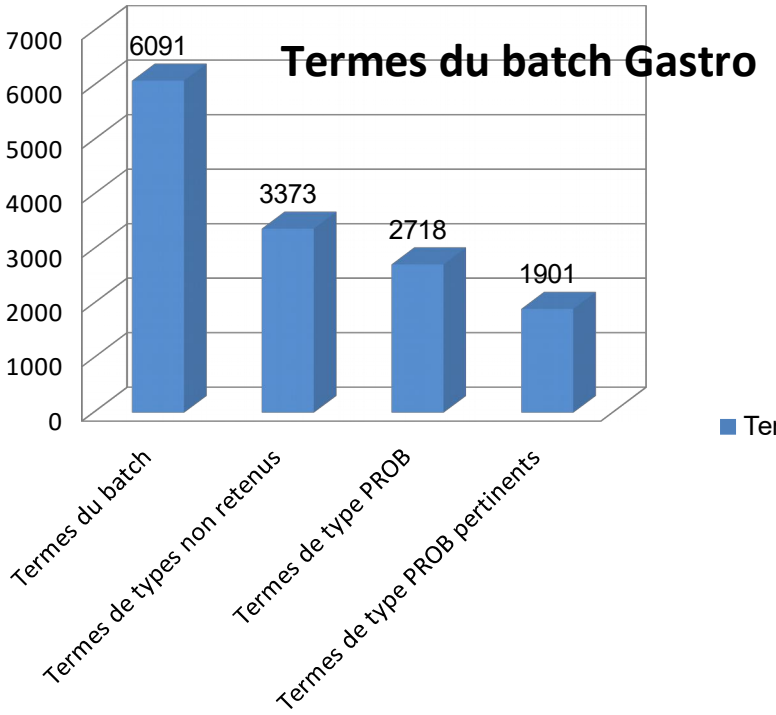
Members of the SingHealth Group
Changi General Hospital · KK Women's and Children's Hospital · Singapore General Hospital
National Cancer Centre · National Dental Centre · National Heart Centre · National Neuroscience Institute · Singapore National Eye Centre
SingHealth Polyclinics

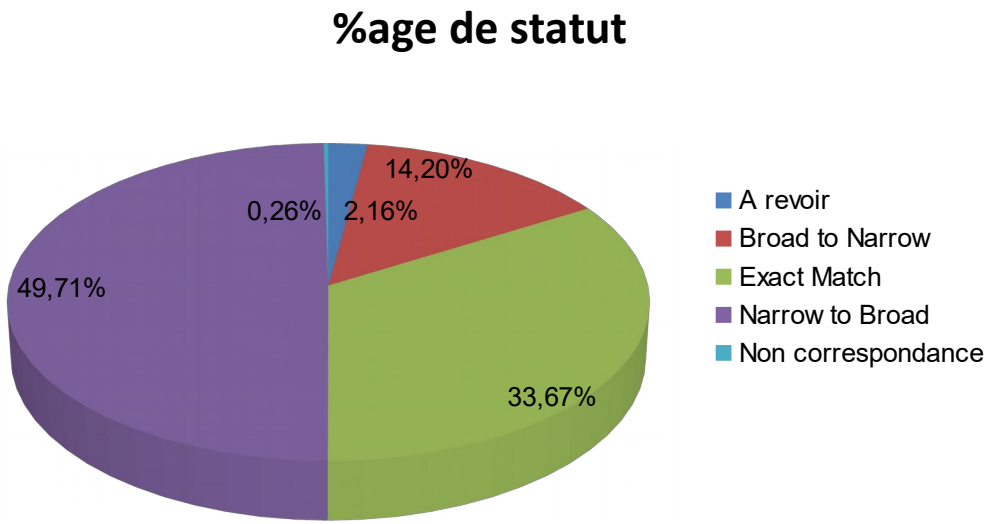
Organisations Accredited by Joint Commission International

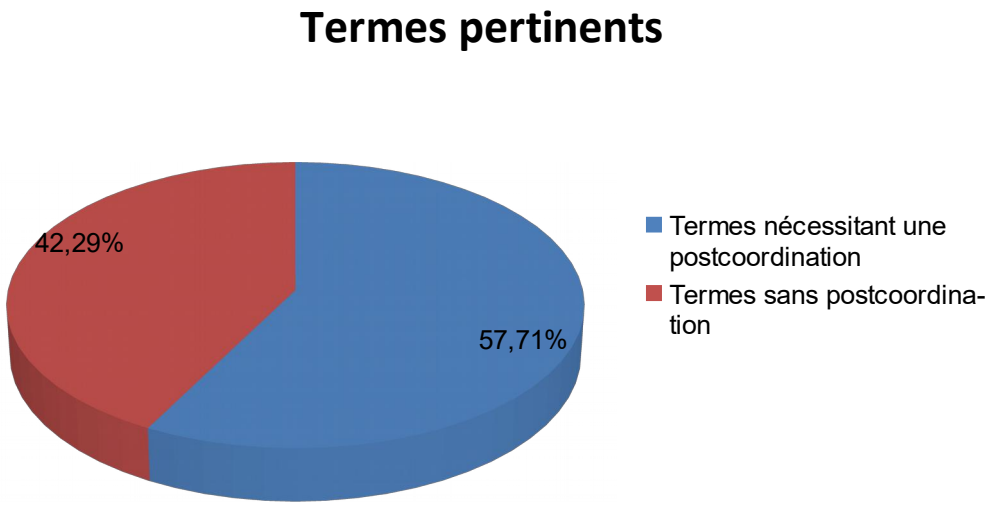
id		
1208	jéjuno-iléite	PROB
1465	prévention d'une cholangite ascendante	PROB
1556	dénutrition dans la cirrhose	PROB
1674	diverticule géant du sigmoïde	PROB
1758	sténose de la diverticulite sigmoïdienne	PROB
2001	pancréatite biliaire sévère	PROB
2005	pathologie biliaire avec cholestase marquée	PROB
2211	TNE gastrique	PROB
2212	TNE multiples sur gastrite atrophique	PROB
2308	GIST gastriques et rectales	PROB
2309	GIST rectales	PROB

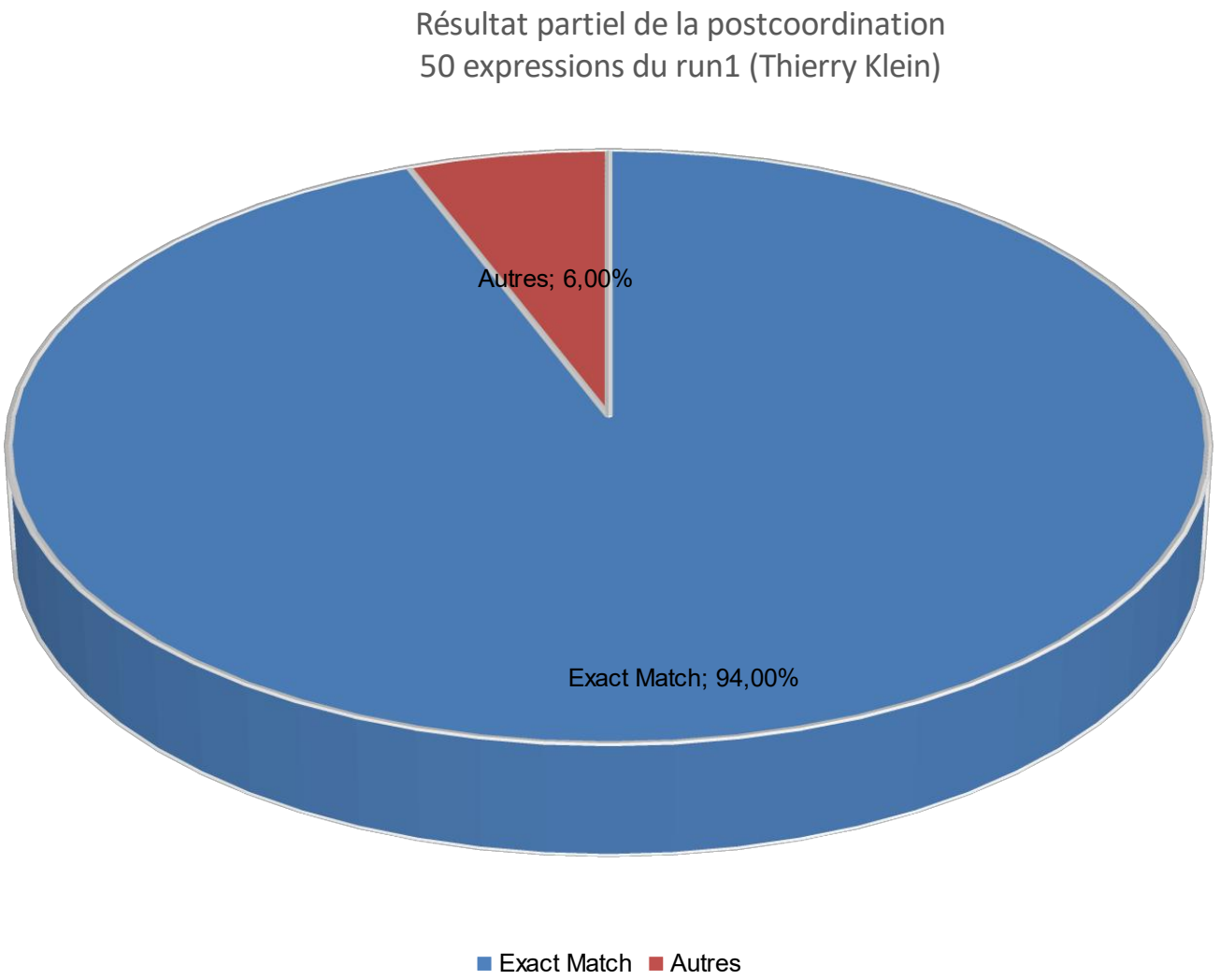
id			<->
2001	pancréatite biliaire sévère	Gallstone pancreatitis (disorder)	95563007
8663	pancréatite aiguë par hyperpression duodénale	Acute pancreatitis (disorder)	197456007
10026	pancréatite aiguë bénigne	Acute pancreatitis (disorder)	197456007
10032	pancréatite aiguë à éosinophiles	Acute pancreatitis (disorder)	197456007
10034	pancréatite bactérienne	Pancreatitis (disorder)	75694006
10035	pancréatite bénigne	Pancreatitis (disorder)	75694006
10036	pancréatite caudale	Pancreatitis (disorder)	75694006
10038	pancréatite chronique douloureuse	Chronic pancreatitis (disorder)	235494005
10039	pancréatite chronique débutante	Chronic pancreatitis (disorder)	235494005
10042	pancréatite chronique réfractaire aux traiteme...	Chronic pancreatitis (disorder)	235494005
10044	pancréatite chronique sévère	Chronic pancreatitis (disorder)	235494005

POST-COORDINATION








Résultat partiel de la postcoordination
50 expressions du run1 (Thierry Klein)
Autres; 6,00%
Exact Match; 94,00%
Exact Match
Autres

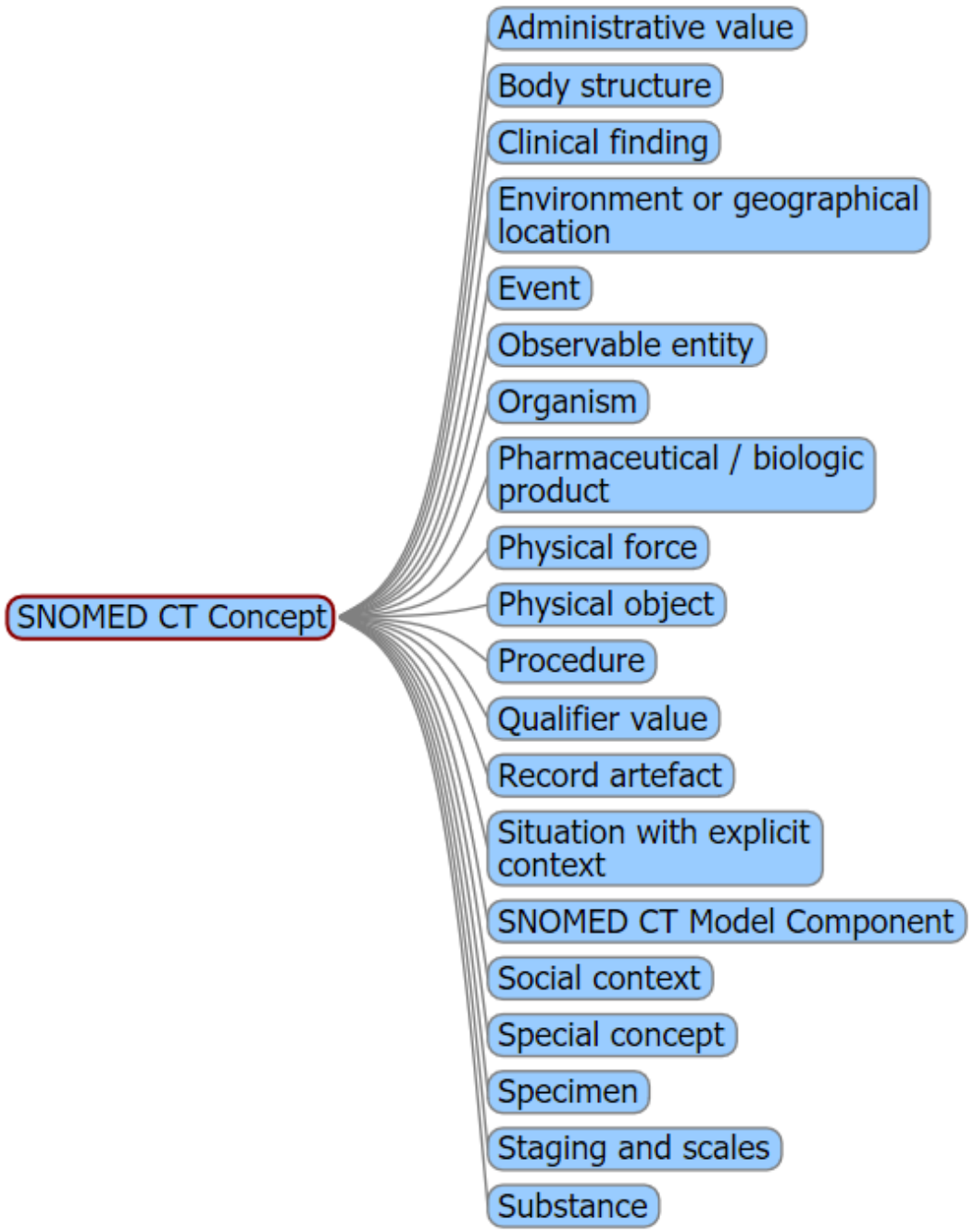
Post - coordination

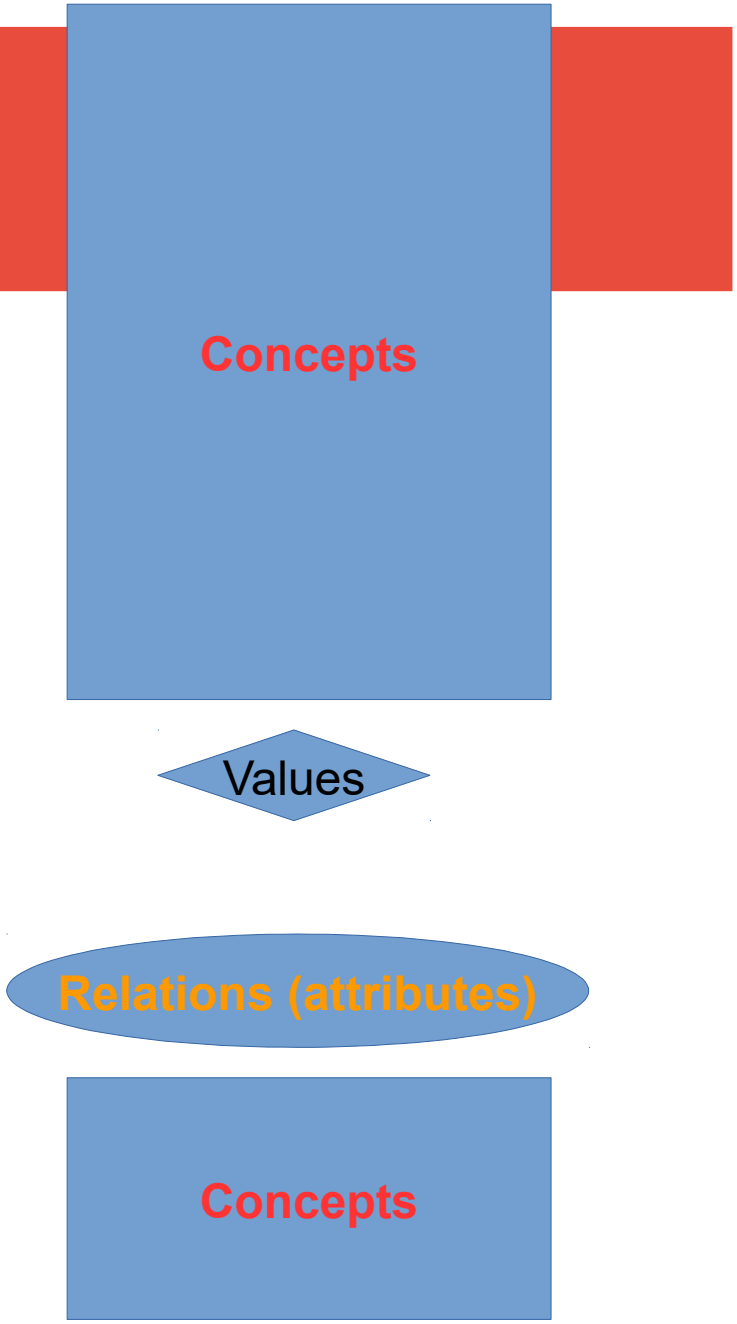
Pancréatite bactérienne

| Pancreatitis (disorder) | : | Causative agent (attribute) |=| Bacterium (organism) |

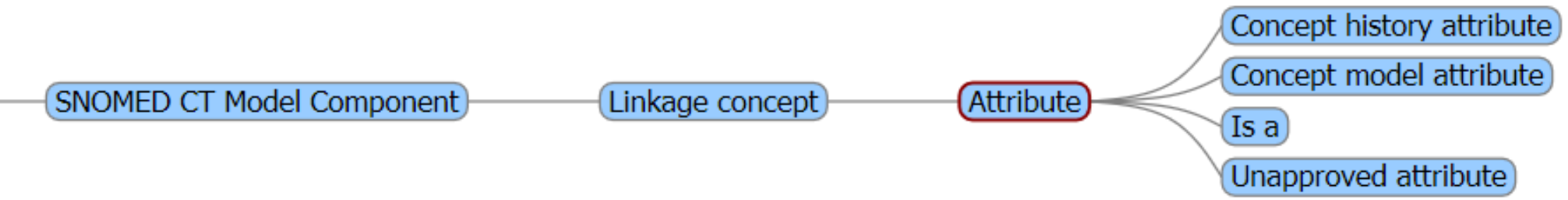
Syntax

|Concept| :| attribute| = |value|


SNOMED CT Concept
Administrative value
Body structure
Clinical finding
Environment or geographical location
Event
Observable entity
Organism
Pharmaceutical / biologic product
Physical force
Physical object
Procedure
Qualifier value
Record artefact
Situation with explicit context
SNOMED CT Model Component
Social context
Special concept
Specimen
Staging and scales
Substance


Concepts
Values
Relations (attributes)
Concepts

Attributes


SNOMED CT Model Component
Linkage concept
Attribute
Concept history attribute
Concept model attribute
Is a
Unapproved attribute

Snomed-CT support

Refsets files
Updates every 6 months

Extensive documentation

- Technical implementation guide
- Editorial guide
- Learning modules, starter guide

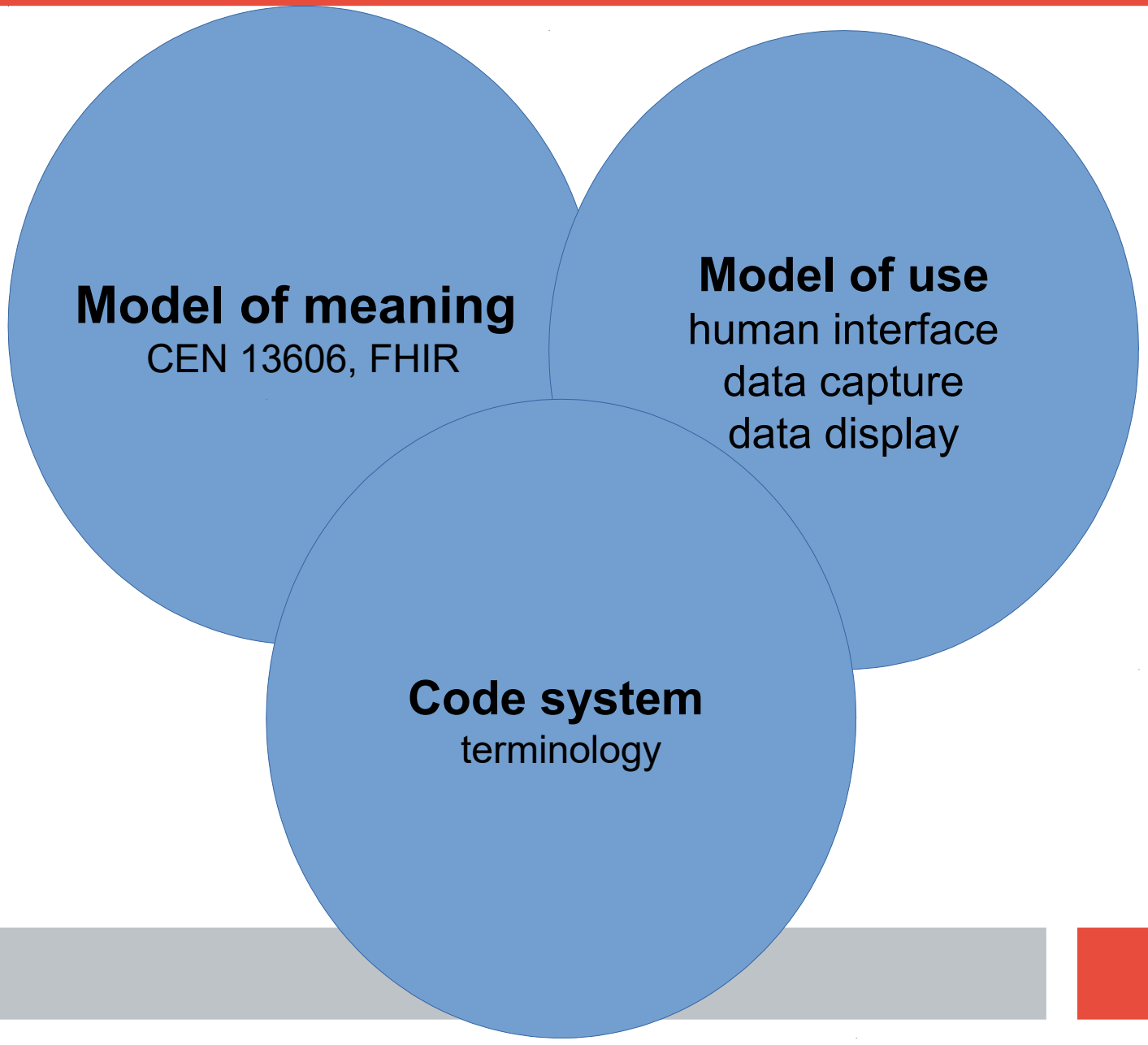
MRCM : machine readable concept model

Browsers, API, MRCM file ...

Drawbacks of Snomed

Ambiguity, redondance
Lack of primary care concepts (symptoms, procedures, social...)
Failure to manage langages in a standardized way
...

Buildings blocks of knowledge management



Material for primary care concept model ?

Primary care concepts are mainly consistent with ICPC principles : many still rules exists !

- **Episode of care definition, problem list definition**
- **Relations with the SOAP**
- **RFE : has to be choose in every component**
- **Other things not expressed in component or sub-component**
  - Risk factor
  - Severity (uncomplicated, complicated, severity stage)
  - Fonctionnality
  - Certainty
  - Chronic disease
  - Inclusion, exclusions, consider
  - Cross chapter issues

Material for primary care concept model ?

- Relations to the other terminologies (ICD, ICF, ICHI, LOINC, SNOMED…)
-
- Relations beetween translations of ICPC → set of files

Focus of ICPC ?

Epidemiology only Doing everything

Epidemiology mainly coded in daily practice → connected to daily professionnel process

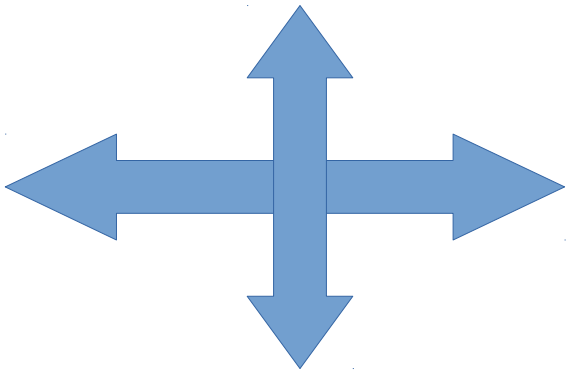
ICPC is still used in many places for other purpose because of the relevance of its categories for clinicians also as an opener of other terminologies

Interoperability of ICPC ?

- With interface terminology (model of use)
- With clinical decision support
- For (academic) education purpose : continuous learning systems
- With hospital systems – continuity of care
- Access to patient information

Hacking ICPC !

Epidemiology only



Doing everything

Would you hack ICPC-3 to ontologize it ?