

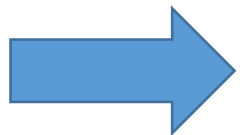
From clinical NLP output to interoperable knowledge graph representations

Stefan Schulz

Akhila Naz Kuppassery Abdulnazar

Phenomena complicating text analysis

- Linguistic
 - Coreference (nominal anaphora based on Type or Subclass relation)
 - Inferred reference (bridging anaphora)
 - Metonymy
- Lexical / Ontological
 - Ambiguity
 - Vague reference (class underspecification)
 - Relation inference



Examples from SNOMED CT

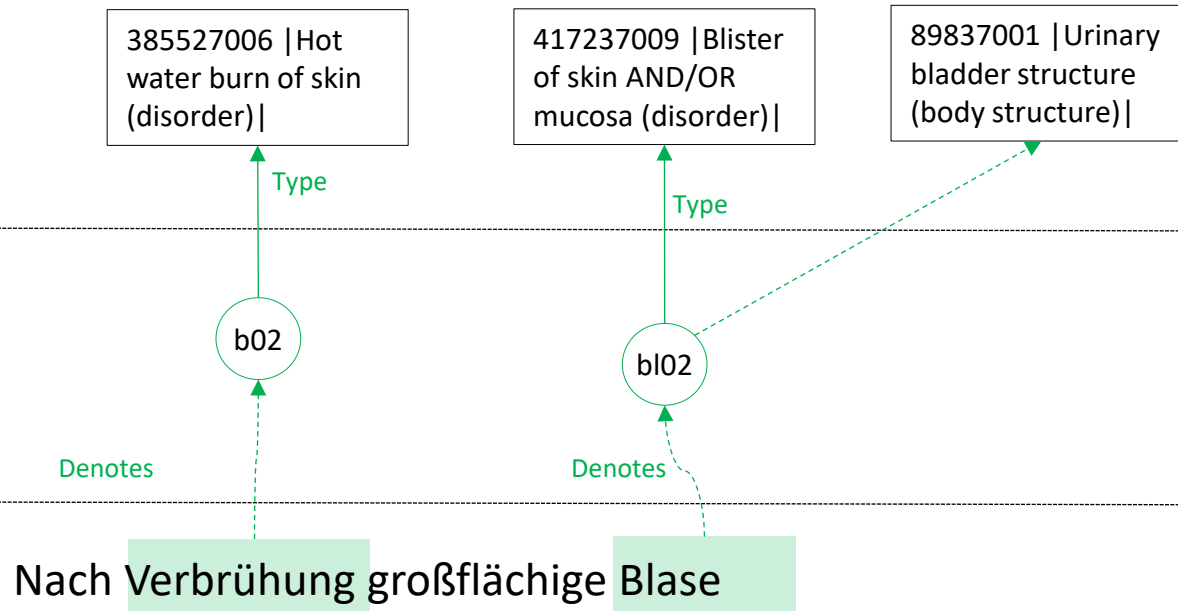
Lexical ambiguity

Lexical ambiguity

T Box

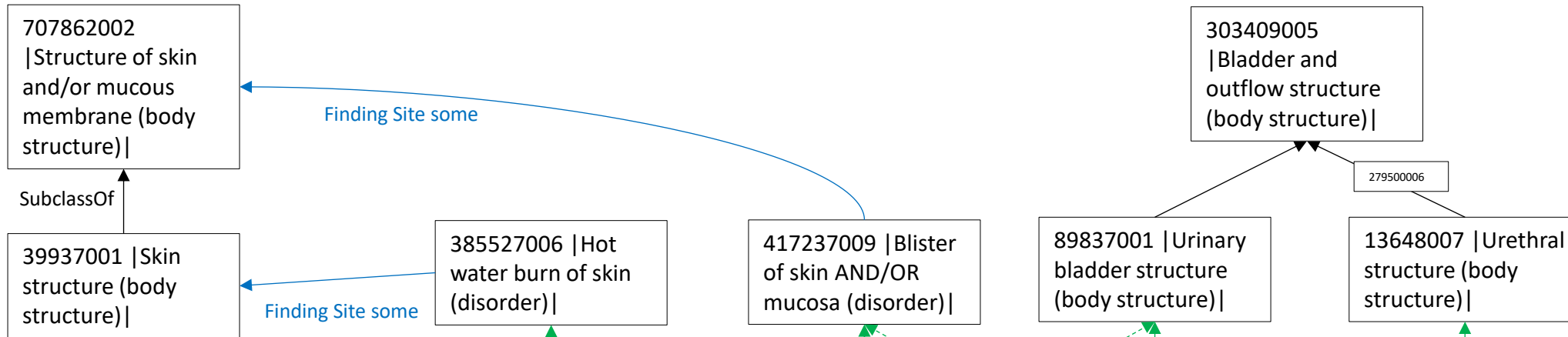
A Box

Text



Lexical ambiguity

T Box



A Box



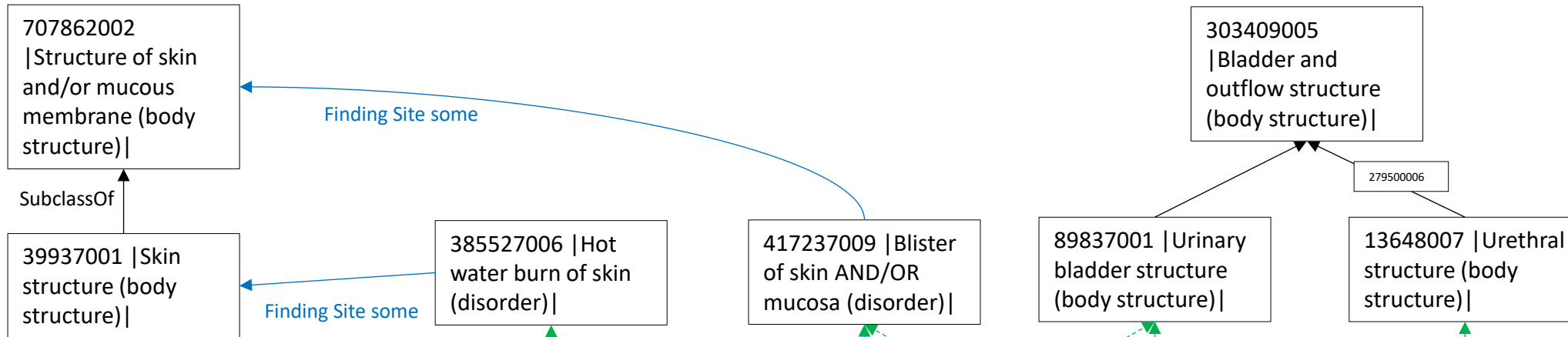
Text

Nach Verbrühung großflächige Blase

Blase und Harnröhre

Lexical ambiguity

T Box



A Box



Text

Nach Verbrühung großflächige Blase

Blase und Harnröhre

Lexical ambiguity

Vector
representation

T Box

707862002
|Structure of skin
and/or mucous
membrane (body
structure)|

SubclassOf

39937001 |Skin
structure (body
structure)|

Finding Site some

Finding Site some

385527006 |Hot
water burn of skin
(disorder)|

Type

417237009 |Blister
of skin AND/OR
mucosa (disorder)|

Type

89837001 |Urinary
bladder structure
(body structure)|

Type

303409005
|Bladder and
outflow structure
(body structure)|

13648007 |Urethral
structure (body
structure)|

Type

279500006

A Box

Denotes

Denotes

Denotes

Denotes

Text

Nach Verbrühung großflächige Blase

Blase und Harnröhre

b02

bl02

v03

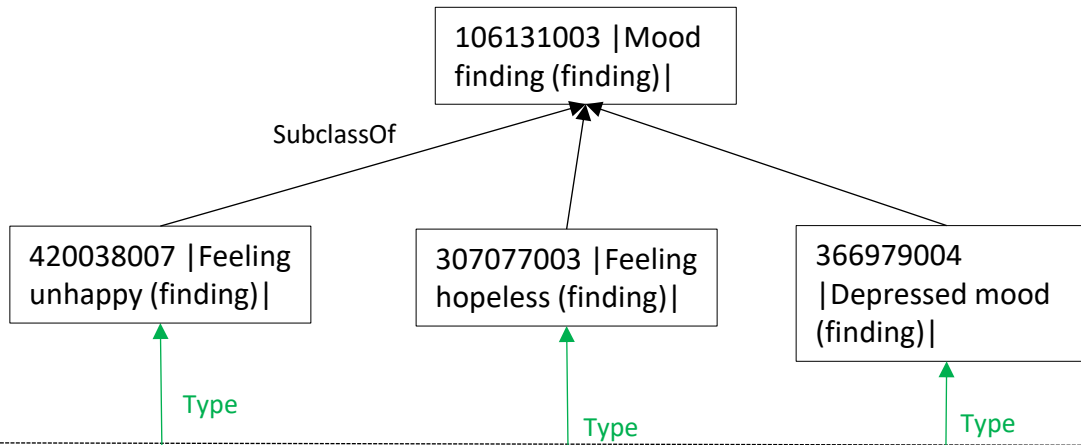
u04

Vague reference

Vague reference

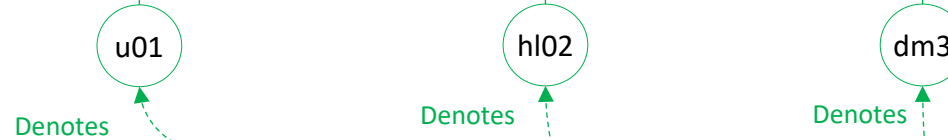
Vector
representation

T Box



No relations other than subclassOf!

A Box



Patient A fühlt sich unglücklich

Patient B fühlt sich niedergeschlagen

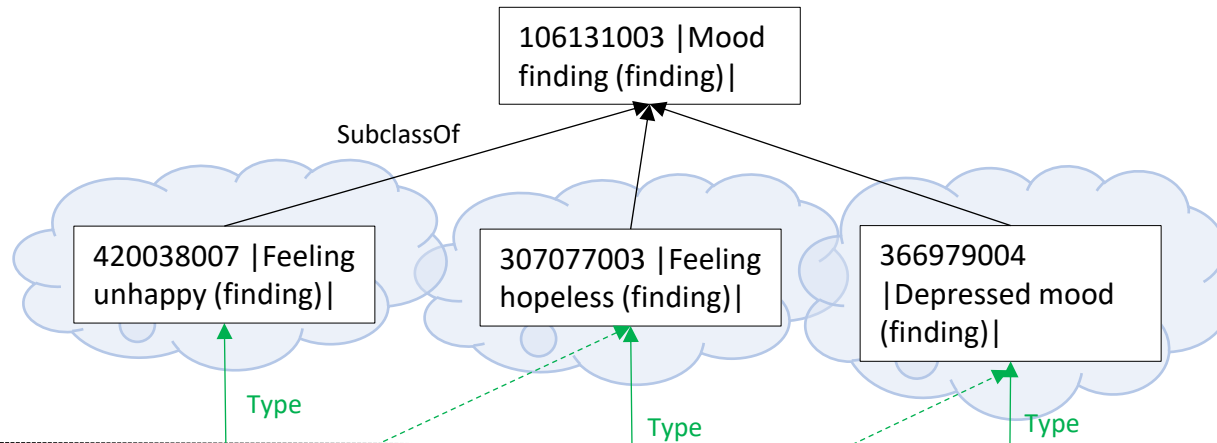
Patient C fühlt sich depressiv

Text

Vague reference

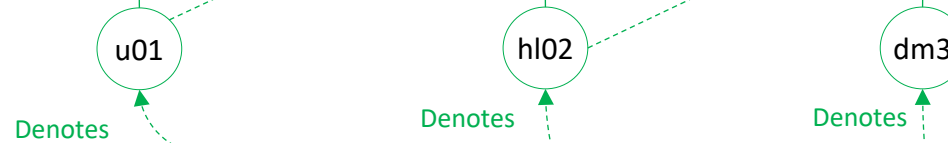
Vector
representation

T Box



No relations other than subclassOf!

A Box



Patient A fühlt sich unglücklich

Patient B fühlt sich niedergeschlagen

Patient C fühlt sich depressiv

Text

Vague reference

Vector
representation

Query

T Box

SubclassOf

420038007 | Feeling
unhappy (finding)|

307077003 | Feeling
hopeless (finding)|

366979004
| Depressed mood
(finding)|

*No relations other
than subclassOf!*

Type

Type

Type

Denotes

Denotes

Denotes

u01

hl02

dm3

Patient A fühlt sich unglücklich

Patient B fühlt sich niedergeschlagen

Patient C fühlt sich depressiv

Text

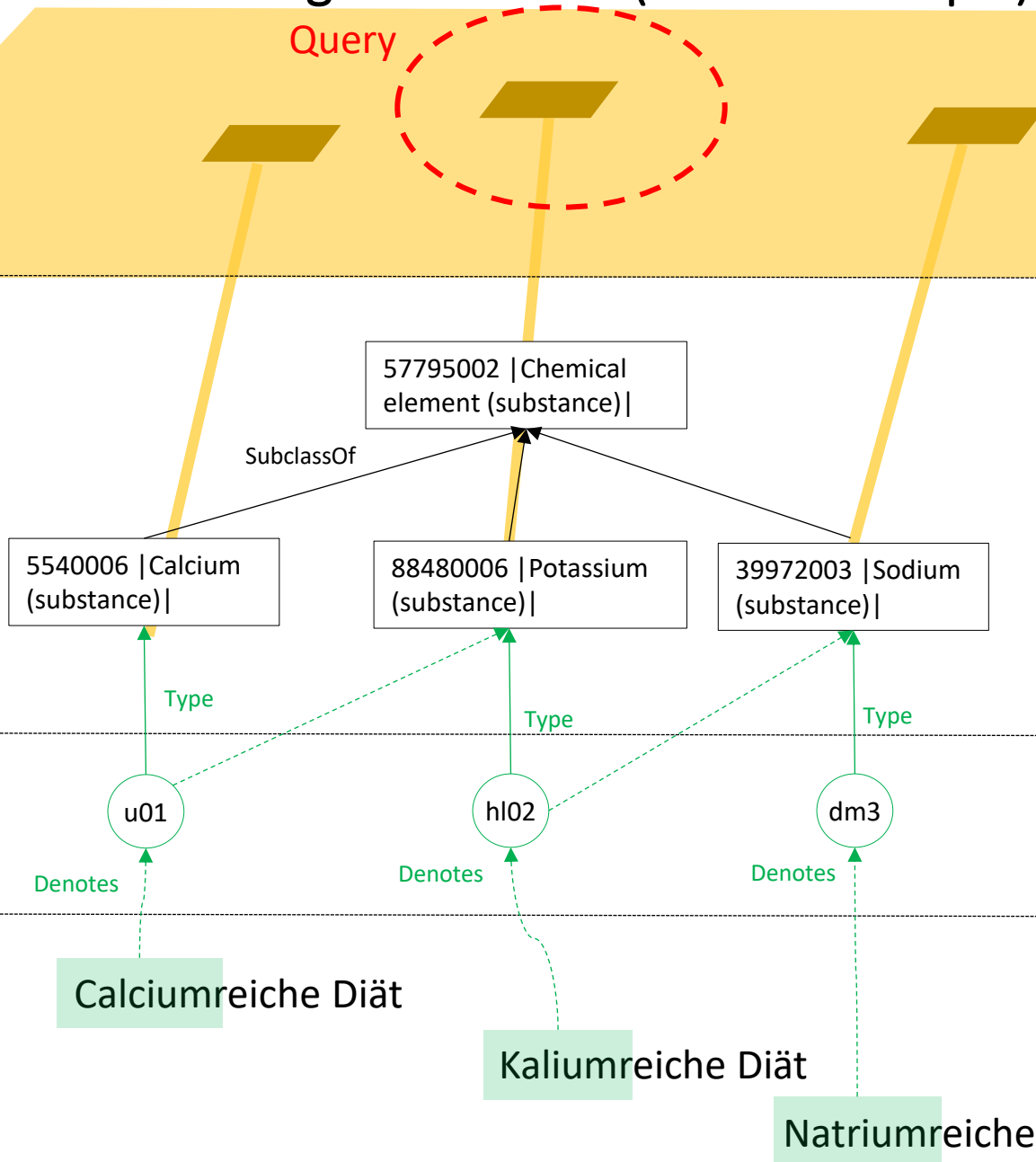
Vague reference (counterexample)

Vector
representation

T Box

A Box

Text

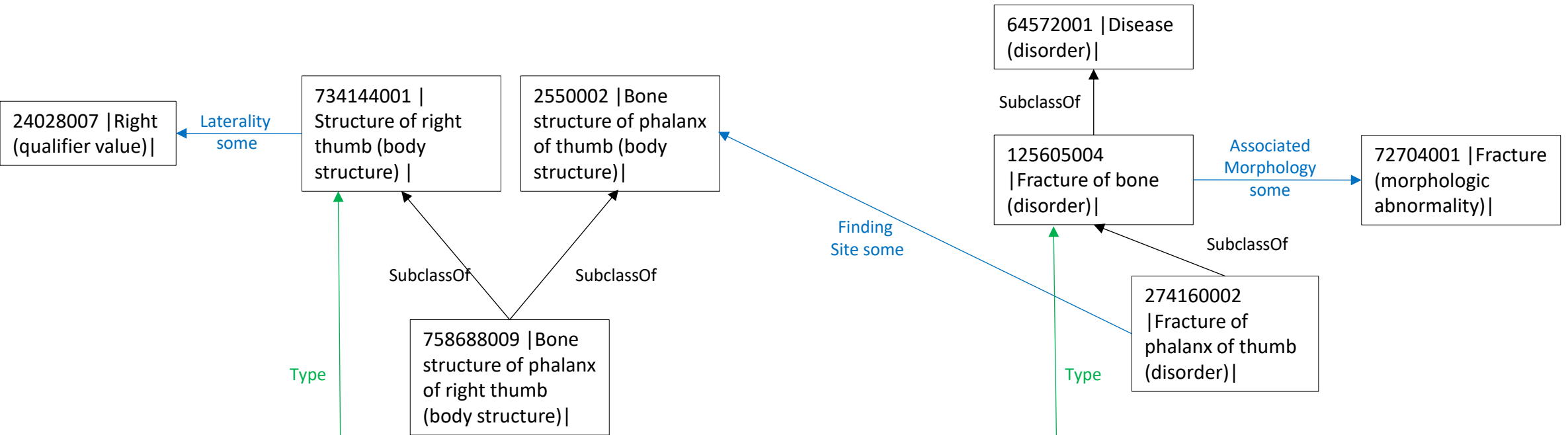


*No relations other
than subclassOf!*

Metonymy, Anaphora, Relation inference

Metonymy, Anaphora, Relation inference

T Box



A Box

Denotes

rt02

Denotes

fr03

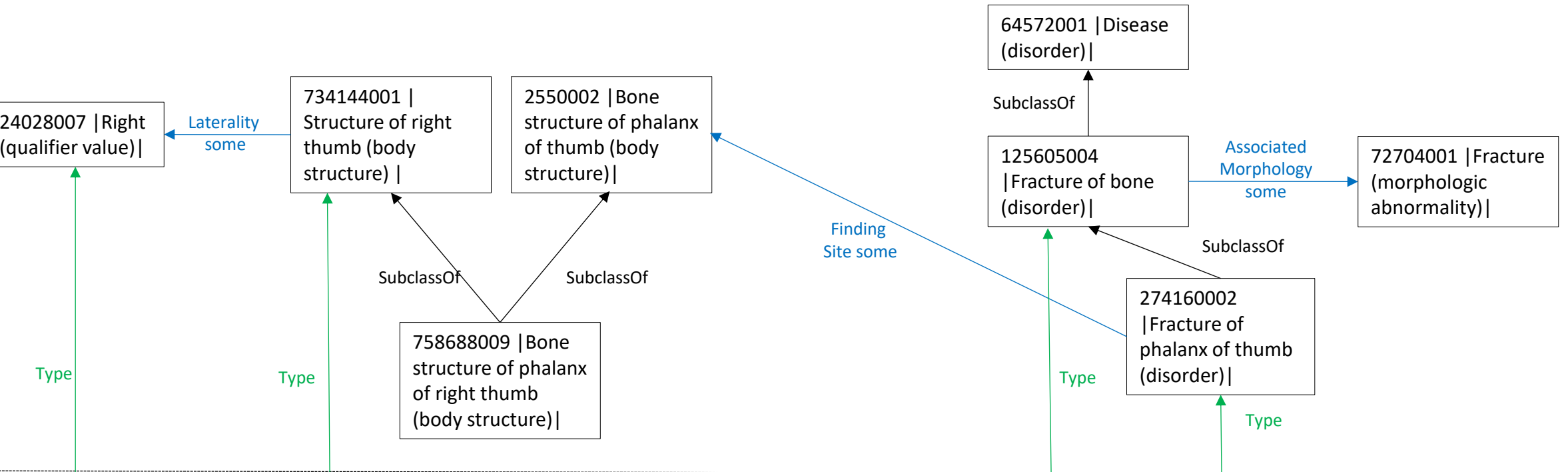
Denotes

Text

Am rechten Daumen finden sich Zeichen einer Fraktur

Metonymy, Anaphora, Relation inference

T Box



Type

Type

Type

Type

A Box

Denotes

Denotes

Denotes

Denotes

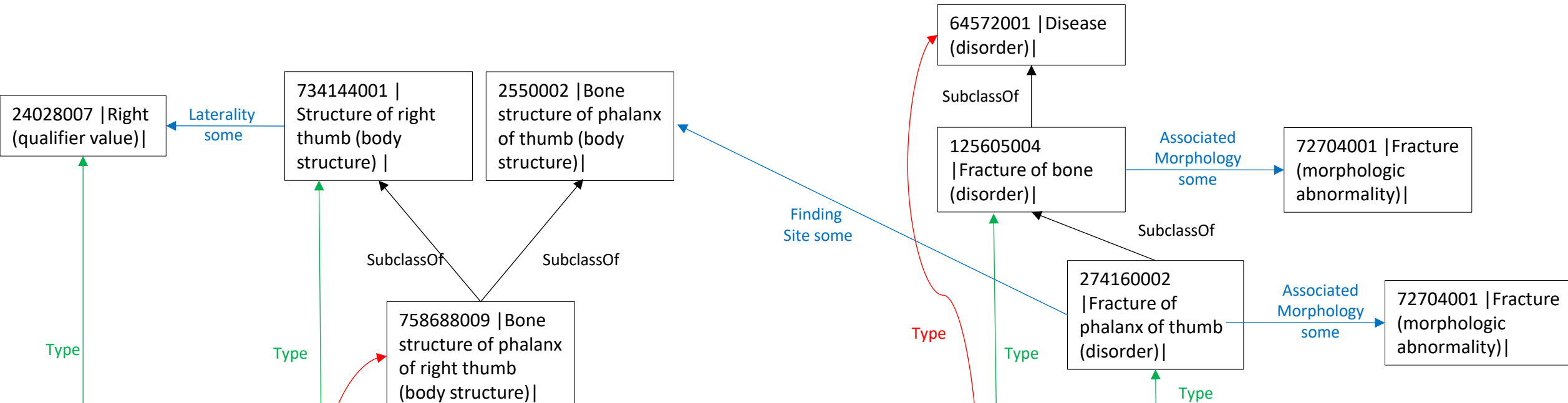
Text

Am rechten Daumen finden sich Zeichen einer Fraktur

Daumenfraktur re.

Metonymy, Anaphora, Relation inference

T Box



Predicted links

