Entity linking for patient-friendly radiology reports

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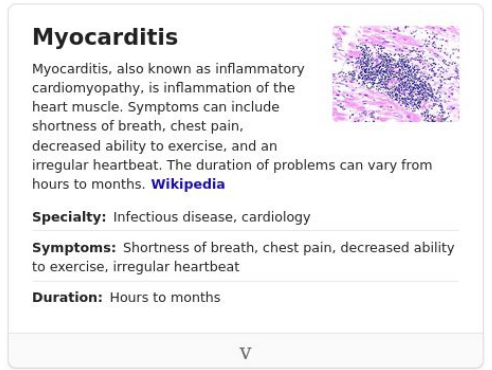
Uitslagen
Deze lijst doorzoeken
Alle uitslagen tonen
Resultaten van [redacted]
MR NEURO LWK SCREENING
Resultaten van [redacted]
• ALAT
ALAT 30 U/l
ALKALISCHE FOSFATASE
Alkalische fosf. (oud) 66 U/l
• ANIONGAP
Aniongap 9 mmol/l
MR NEURO LWK SCREENING - details
Datum en tijd
Startdatum [redacted]
Starttijd [redacted]
Onderzoeksresultaat
Relevante voorgeschiedenis: Geen
Gerichte vraagstelling: Radiculair syndroom L5 (DD L4) links; aanwijzingen voor stenose of HNP met wortelcompressie L4/L5?
Verslag:
MRI LWK. Onderzoek volgens screeningsprotocol. Ter correlatie CT coronarografie d.d. [redacted]
Er zijn 5 wervelcorpora van het lumbale type. Er is een normale lumbale lordose.
Geen suspecte signaalkarakteristieken in het afgebeelde skelet.
Er normale positie van de conus medullaris, deze is ook normaal gevormd. Er is normaal aspect van het filum terminale.
Een normale hoogte en normale signaalintensiteit van de disci vanaf Th11 tot aan L5.
Op deze niveaus ook geen noemenswaardige bulging discus of noemenswaardige posterieure haakvorming.
Daarentegen dehydratie en hoogteverlies van discus L5-S1. mengbeeld van Modic type-II veranderingen met minimale Modic type 1 veranderingen in de aangrenzende dek en sluitplaat. Minimale Schmorlse impressies op dit niveau.
Er is een breedbasische mediane / links paramediane discusprotrusie met resulterend een versmalling van laterale recessus. De beide foramina zijn ruim doorgankelijk.
Geen kritieke nevenbevindingen paravertebraal.
Conclusie:
Discopathie L5-S1 met een mengbeeld van Modic type 3 en Modic type 1 veranderingen in de aangrenzende dek en sluitplaat. Breedbasische mediane / links paramediane discusprotrusie met resulterend een versmalling van laterale recessus (S1).

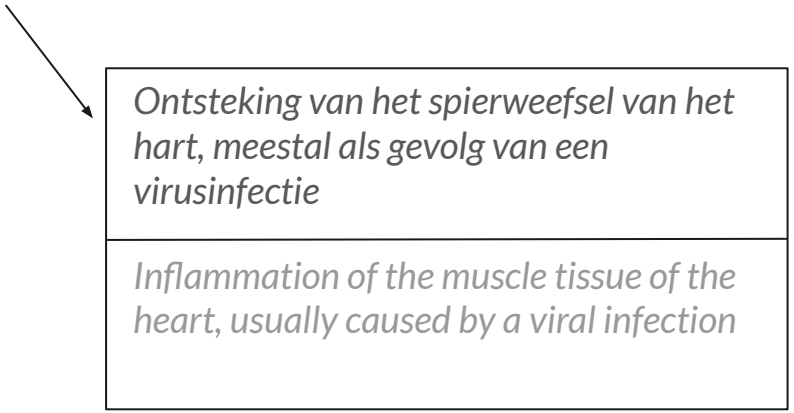
Entity linking

- Link terminology (“mentions”, “concepts”) to e.g. Wikipedia **entities**
- “[...] Patient experiences chest pain, *myocarditis*? [...]”



Entity linking

- Link terminology (“mentions”, “concepts”) to SNOMED-CT **entities**
- “[...] Patient experiences chest pain, *myocarditis*? [...]”



https://www.nictiz.nl/standaarden/snomed-ct/

myocarditis: 50920009

Myocarditis (50920009)

Names

Name	Term Type
Myocarditis	PT
Myocarditis (disorder)	FN
Myocardial inflammation	SY

Obsolete / Suppressible Names

UMLS Concepts

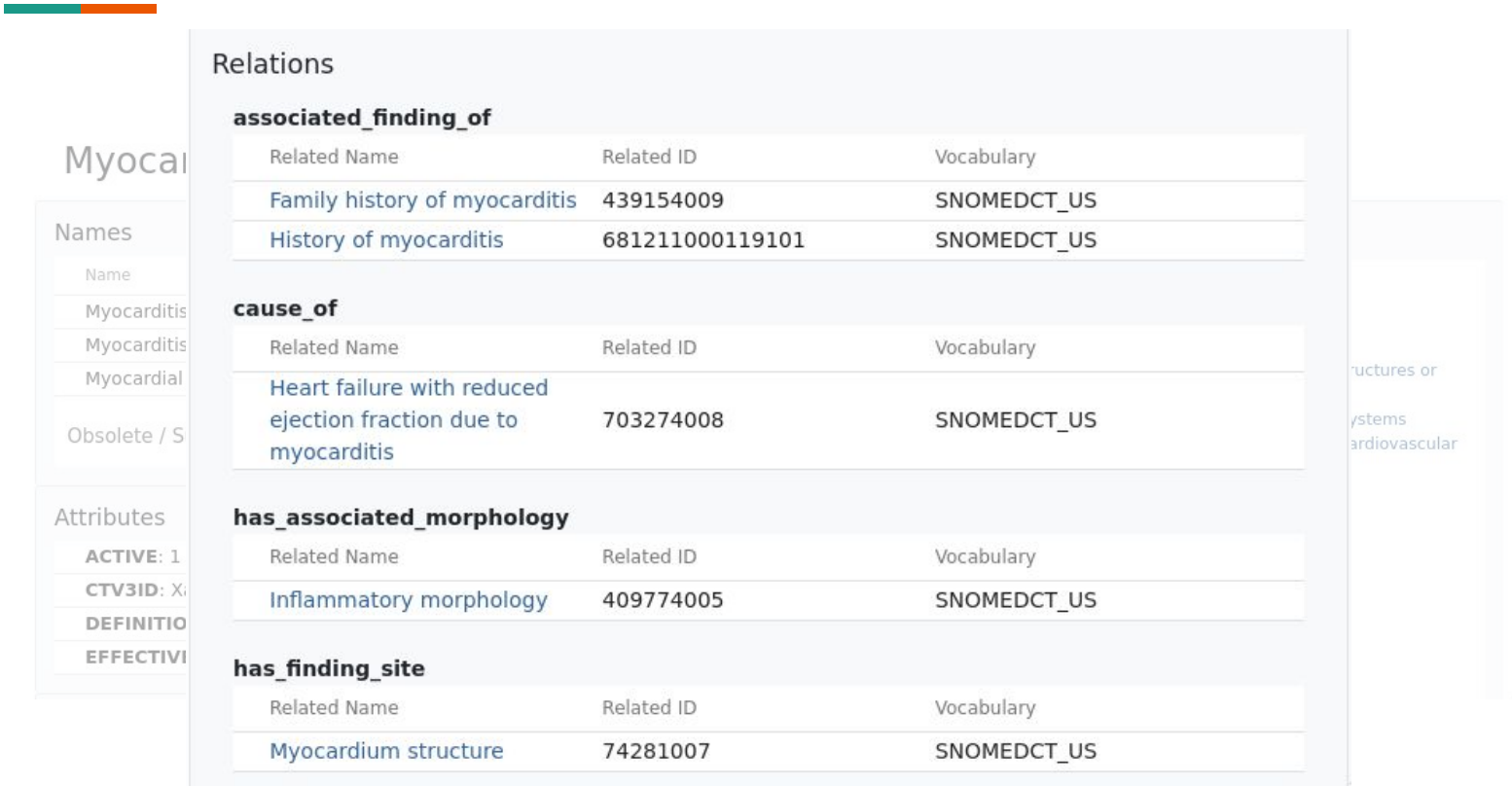
Name	CUI
Myocarditis	C0027059

Hierarchy

SNOMED CT Concept
Clinical finding
Disease
Disorder by body site
Inflammation of specific body structures or tissue
Inflammation of specific body systems
Inflammatory disorder of the cardiovascular system
Carditis
Myocarditis
Acute myocarditis
Chronic myocarditis
Eosinophilic myocarditis
Fetal myocarditis
Fibroid myocarditis
Giant cell myocarditis
Idiopathic myocarditis

Attributes

ACTIVE: 1
CTV3ID: XaDyL
DEFINITION_STATUS_ID: 900000000000073002
EFFECTIVE_TIME: 20040731


Myocar
Names
Name
Myocarditis
Myocarditis
Myocardial
Obsolete / S
Attributes
ACTIVE: 1
CTV3ID: X
DEFINITIO
EFFECTIVI
Relations
associated_finding_of
Related Name
Related ID
Vocabulary
Family history of myocarditis
439154009
SNOMEDCT_US
History of myocarditis
681211000119101
SNOMEDCT_US
cause_of
Related Name
Related ID
Vocabulary
Heart failure with reduced ejection fraction due to myocarditis
703274008
SNOMEDCT_US
has_associated_morphology
Related Name
Related ID
Vocabulary
Inflammatory morphology
409774005
SNOMEDCT_US
has_finding_site
Related Name
Related ID
Vocabulary
Myocardium structure
74281007
SNOMEDCT_US

Example

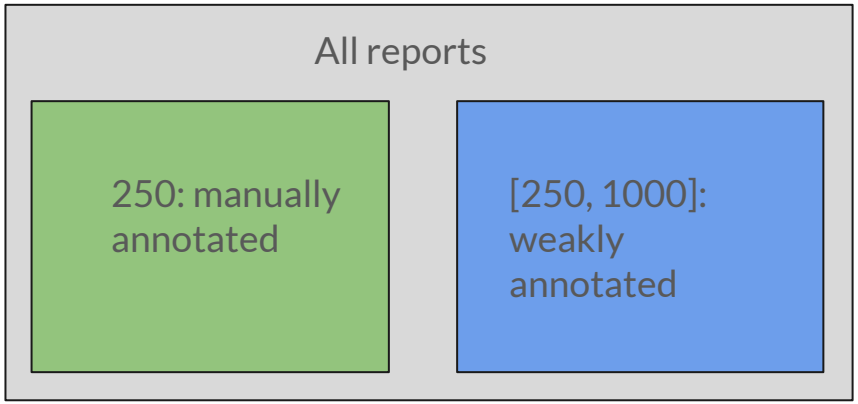

Medische gegevens:
Bilateraal
gemetastaseerd
hypofarynxcarcinoom
intraveneuze toediening
van contrast. Geen vergelijking met eerder onderzo
via de
ary-epiglottische plooi
links tot voor de juiste
ware stemband
nivea
het
een vliesplooi in de keel
tussen het kraakbeen
en het strotklepje
, echter geen
erosieve
aantasting.
Patholo
4
bilateraal
Conclusie: Het radiologisch beeld kan passen bij
hypofarynxc

Entity linking

- Naive (feature-based) lookup (NL) of SNOMED-CT terms in reports does not give us everything we want
- How much manual work necessary?
  - Start with NL, incrementally add manual corrections to dictionary
- Propagation of manual corrections to unseen reports?
  - More (higher quality) training data for e.g. neural tagger (Flair)

Data

- Domain: CT thorax/abdomen
- 250 manually annotated
  - 50 reserved for evaluation
  - 0, …, 200 incrementally used to update NL



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- 250 manually annotated
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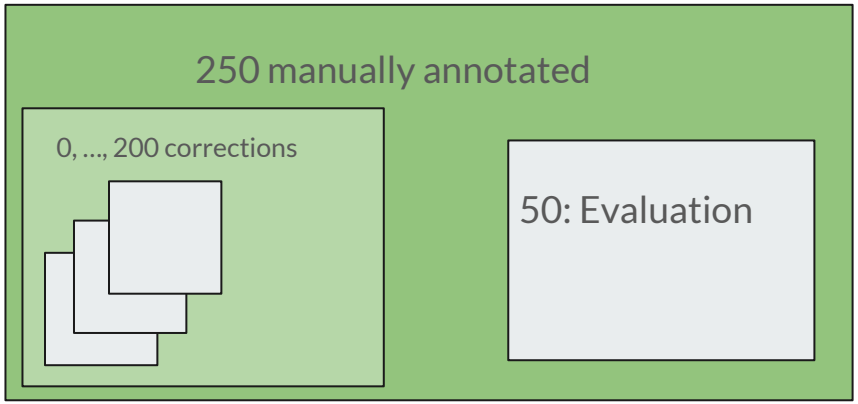
Total entities	11457
Avg entities per report	45.83
Stdev	26.89



Data

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- 250 manually annotated
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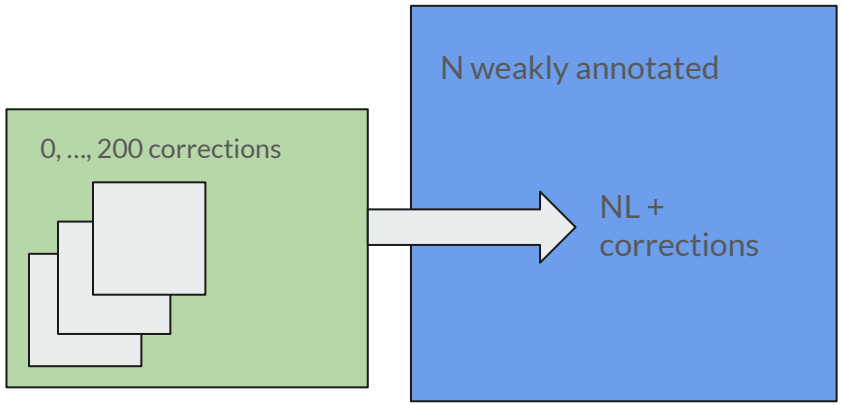
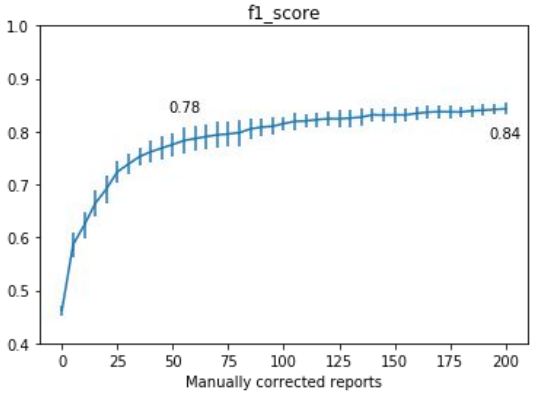
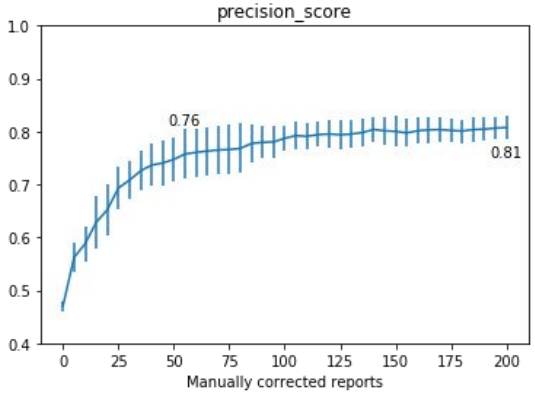
  - 0, …, 200 incrementally used to update NL
- N [250, 1000] weakly annotated by NL, updated with manual annotations

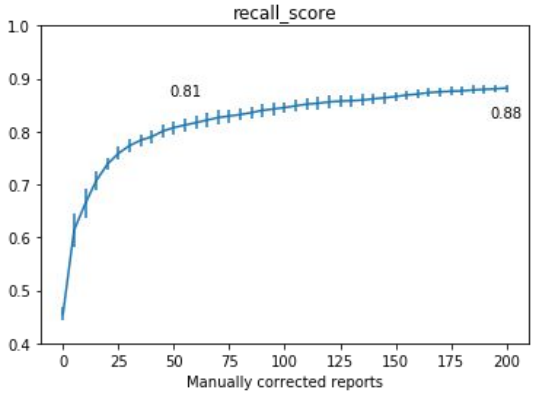


How much manual work necessary?

- NL evaluation

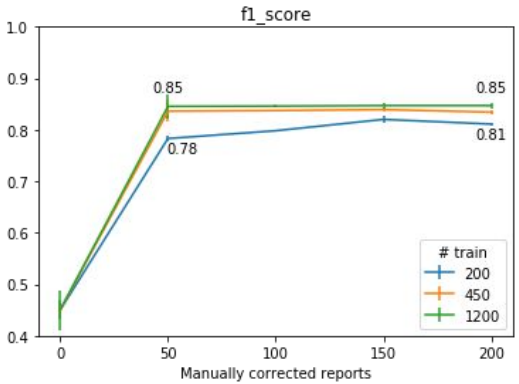


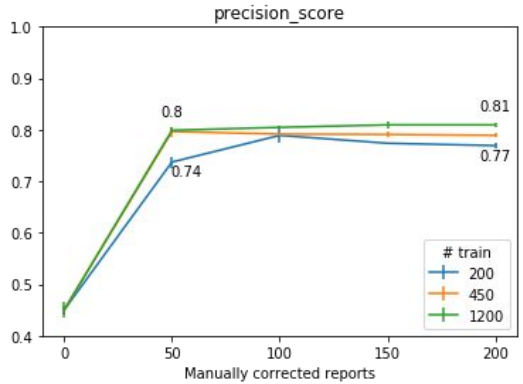


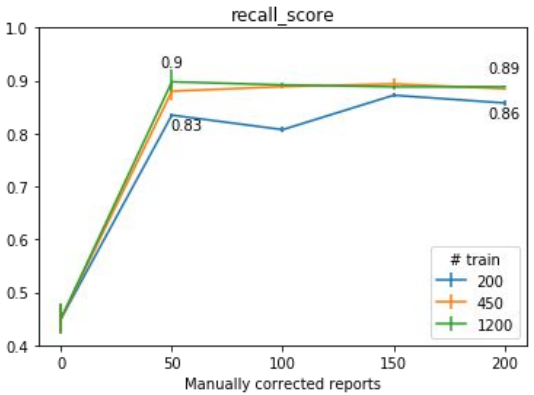


Propagate manual corrections?

- Neural tagger evaluation (Flair with contextual embeddings)







Next steps

- Many SNOMED-CT concepts do not have a (patient-friendly) description
  - Pull from other sources, create ourselves
  - Talking with Nictiz about possibly expanding vocabulary
- Linking images to report where findings are referenced
  - Two MSc projects on separate parts of this currently in progress
- Student project for patient survey with colleagues from IQ healthcare
- What else makes a report ‘patient-friendly’?

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Thank you!