



LYNXCARE

Enhancing Hematologic Oncology Data Capture in the OMOP CDM: Methodological Advances and Challenges

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27 September 2024, OHDSI UK Meeting



Hematologic Oncology Data is Complex



Challenges: inconsistent terminologies, multiple subtypes, complex variables

Hematologic oncology encompasses a wide range of **complex variables** that are often **challenging to capture**

Detailed and nuanced nature

Varied documentation practices

Use of inconsistent terminologies

CLL: Clinical Stages

RAI			
Low-risk	Stage 0	lymphocytosis	> 15 yrs
Intermediate-risk	Stage I	lymphadenopathy	7-8 yrs
	Stage II	Spleen/Liver enlarged	
High-risk	Stage III	Hb < 11	5-6 yrs
	Stage IV	Platelets < 100,000	

BINET			
Low-risk	Stage A	< 3 lymphoid areas enlarged	> 15 yrs
Intermediate-risk	Stage B	≥ 3 lymphoid areas enlarged	7-8 yrs
High-risk	Stage C	Hb < 10	5-6 yrs
		Platelets < 100,000	

Complex disease classifications

Multiple subtypes and staging systems



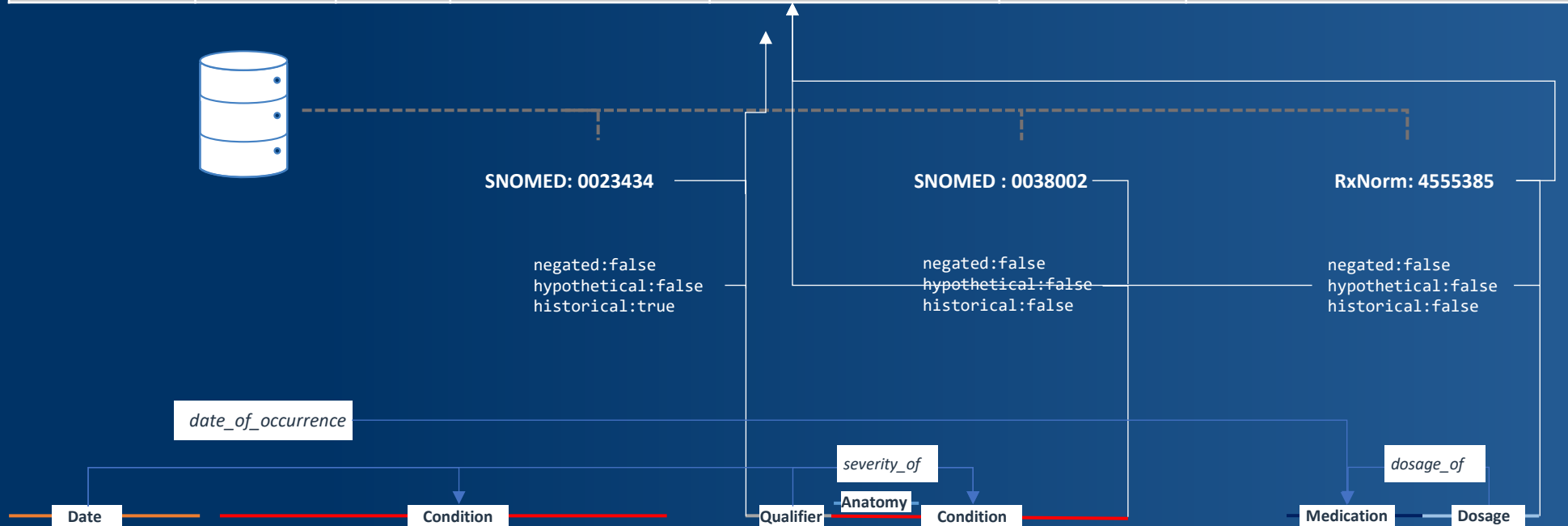
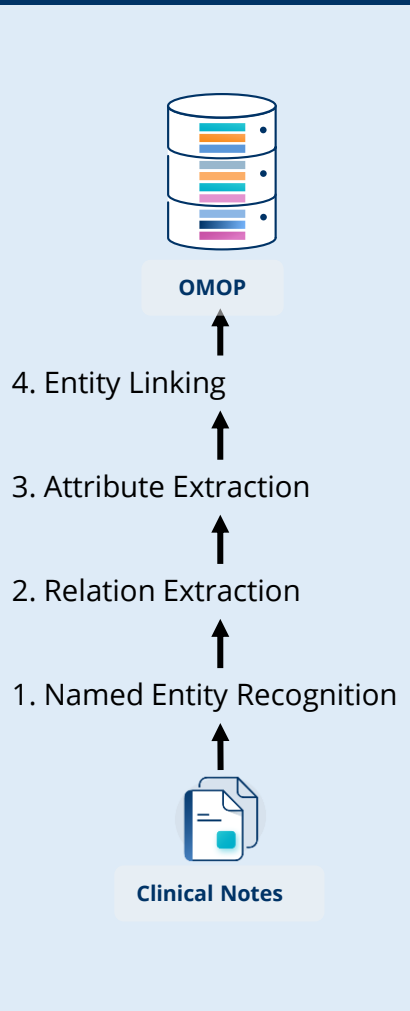
Algorithm to interpret detailed classification criteria accurately

NLP pipeline overview



From unstructured data extraction to integration into OMOP CDM

Note_NLP_ID	NOTE_ID	OFFSET	LEXICAL_VARIANT	NOTE_NLP_CONCEPT_ID	NLP_SYSTEM	TERM_MODIFIERS
0	00001	12	chronic lymphocytic leukemia	0023434	LynxCare_NLP	NEGATED=FALSE,UNCERTAIN=FALSE
1	00001	57	splenomegaly	0038002	LynxCare_NLP	NEGATED=FALSE,UNCERTAIN=FALSE
2	00001	93	Ibrutinib 420 mg	4555385	LynxCare_NLP	NEGATED=FALSE,UNCERTAIN=FALSE

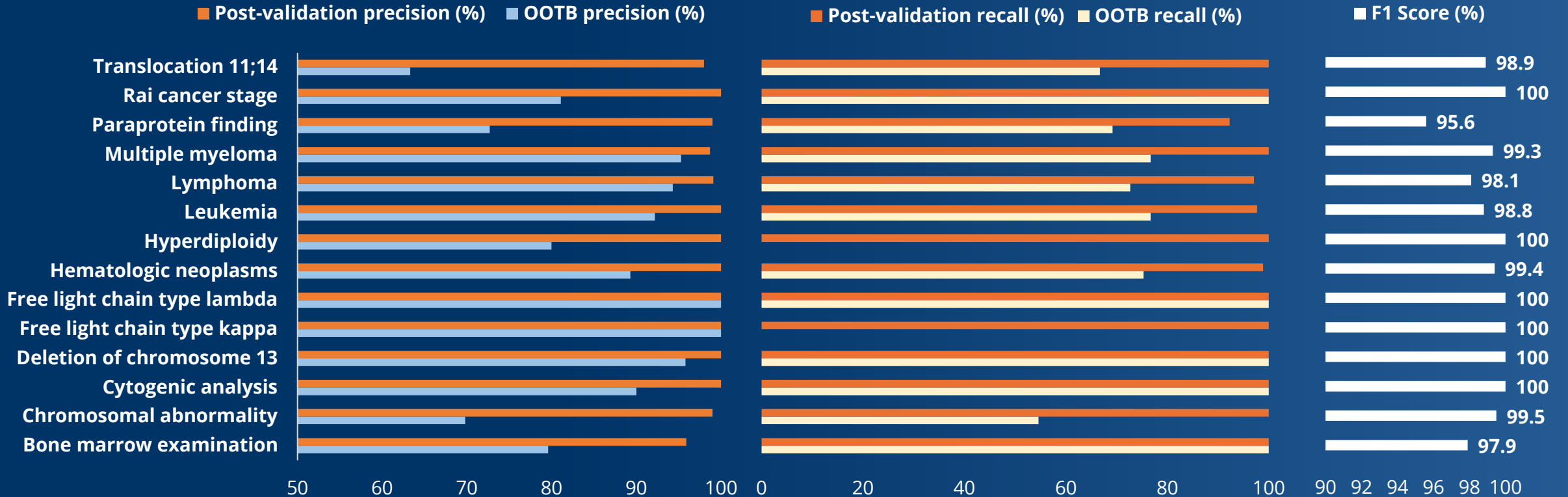


March 2019: Chronic lymphocytic leukemia with mild spleen enlargement for which Ibrutinib 420 mg...

Performance Metrics



Out-of-the-box (OOTB) vs post-validation metrics show improvement after optimization



NLP Pipeline Details & Demo



NLP pipeline: demo of text to OMOP CDM in real time

- ◆ Models trained on in-house datasets curated by LynxCare
- ◆ Transformer-based models trained for different sub-tasks
- ◆ Meta-annotations: negation, temporality, relation to patient vs family member

LynxCare NLP in action:





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