Targeting abbreviated medication names with NLP

Mara Alexeev, MD, MPH [1,]
@MaraAlexeev
mara.alexeev@childrens.harvard.edu
Amir Kimia, MD[2] Marvin B. Harper, MD[2] Assaf Landschaft, M.Sc.[3] Al Ozonoff, PhD, CPPS[4, 5]

[1] Department of Pediatrics, Boston Children's Hospital
[2] Division of Emergency Medicine, Boston Children's Hospital
[3] Boston Children's Hospital
[4] Precision Vaccines Program, Boston Children's Hospital
[5] Department of Pediatrics, Harvard Medical School

Introduction

According to The Joint Commission, medication names should not be abbreviated as misinterpretation may lead to administration of incorrect medication. Computerized order entry use eliminates this problem for orders, but clinical notes and narratives are still filled with abbreviations.

Objectives

Identify abbreviated medication names in clinical narratives, using Natural Language Processing, as a first step towards elimination in medical documentation.

Methods

Retrospective chart review of pediatric ED consult notes at a tertiary pediatric center in 2019. We targeted consult notes due to potential differences in expertise between the documenting and reading providers.

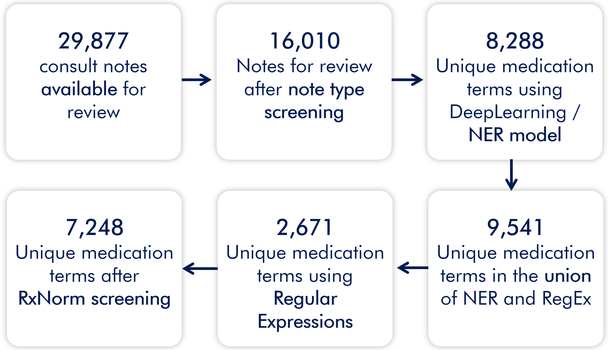
Abbreviated, misspelled and true medication names were identified using 2 Natural Language Processing methods:

1. named-entity recognition (NER) using a pre-trained model called MED7
2. Regular Expressions (RegEx) used to identify strings likely to be medications given surrounding text context

Natural Language Processing tools can identify abbreviated medication names.

Libraries of these should be incorporated seamlessly into clinical documentation tools.

Results



Selected Abbreviated Medication Names Found

Term	Count	Potential Meanings
vanc	101	vancomycin
ctx	98	ceftriaxone, Cytoxan
vanco	67	vancomycin
midaz	62	midazolam
ceftaz	39	ceftazidime
lzp	35	lorazepam
amox	32	amoxicillin
norepi	30	norepinephrine
tazo	20	tazobactam
oxc	20	oxcarbazepine, ofloxacin, oxycodone
oxcarb	18	oxcarbazepine
tacro	16	tacrolimus
vgb	15	vigabatrin
ivmp	14	intravenous methylprednisolone
mmf	14	mycophenolate mofetil, maxillomandibular fixation
acei	14	angiotensin converting enzyme inhibitor, acetylcholinesterase inhibitors
phb	13	phenobarbital

Conclusions

Natural Language Processing tools can create libraries of abbreviated medication names used by clinicians. We can then use the output to determine usage frequency and risk of misinterpretation. Abbreviations are not limited to medications; future studies should include more abbreviation types and domain-experts to help interpret domain-specific expressions. Like a spell checker, these libraries could be incorporated into documentation tools in EMR systems to suggest expanded terms.

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