

Unstructured Clinical Documentation Reflecting Cognitive and Behavioral Dysfunction: Toward an EHR-based Phenotype for Cognitive Impairment

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BACKGROUND

- Cognitive impairment is under-detected during hospitalization
- The electronic health record (EHR) contains detailed clinical information including structured (e.g. ICD codes) and unstructured (e.g. narrative text) data that may improve methods for detection and diagnosis
- High-risk and underrepresented groups are more likely to experience hospitalization but less likely to receive diagnoses, limiting the utility of structured data (i.e. ICD codes, medications) in EHRs
- Understanding the availability and characteristics of unstructured data describing cognition is necessary to advance text mining applications capable of improving detection of potential cognitive impairment

OBJECTIVE

- Identify and characterize unstructured data reflecting symptoms of cognitive impairment in the acute-care EHRs of patients with dementia

METHODS

- Retrospective cohort study, medical record review
- N=343 non-hospice Medicare beneficiaries with primary diagnosis of hip fracture or stroke and documented dementia as identified by Medicare claims techniques demonstrating good sensitivity (85%) and specificity (89%)
- Clinician reviewers identified and classified unstructured data using standardized criteria; narrative text was evaluated for key terminology
- Blinded, random reliability assessment of 10% of EHRs; Cohen's Kappa Coefficient 0.82 (0.02 SD; 95% CI 0.78-0.87)

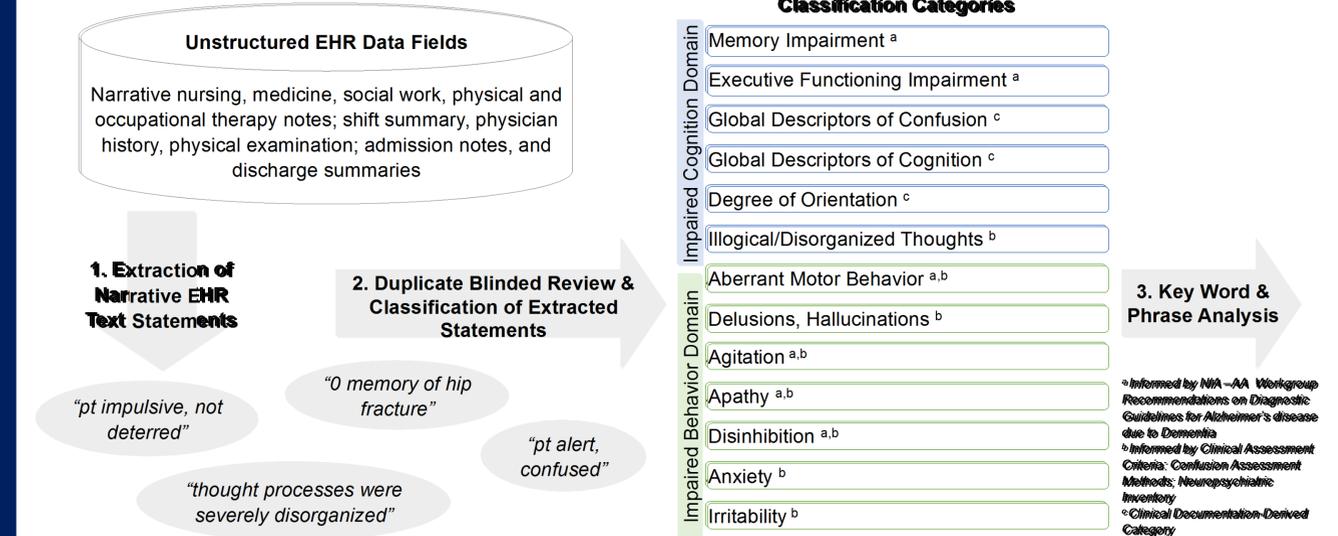
RESULTS

- Findings suggest that inpatient clinicians use specific terminology to describe symptoms of cognitive impairment
- Relevant terminology was prevalent in acute care EHRs of dementia patients and predominantly described symptoms in general/vague terms such as "poor mental status." Most terminology was not consistent with gold-standard clinical assessment or diagnostic criteria, which may reflect lack of clinician training

Narrative text describing cognitive and behavioral dysfunction are prevalent in the unstructured EHR text fields of hospitalized patients with dementia and include shared key terminology that can complement automated EHR-based screening approaches

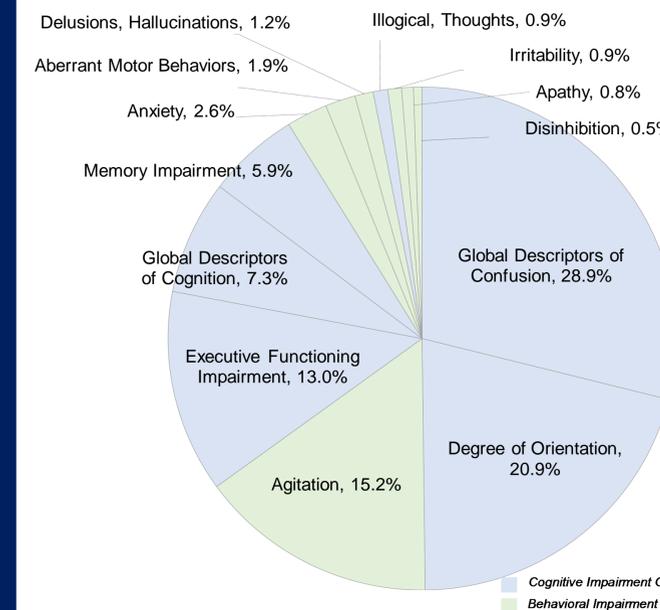


Classification of Unstructured EHR Data



Characteristics of Narrative Text in Unstructured Data Fields

Characteristics of Narrative Text Statements (N=2,444)



Key Terminology

Cognitive Impairment Categories		
Memory Impairment	•"0 Memory/Recall" •"Repeats Questions"	•"Poor Historian" •"Forgets"
Executive Functioning Impairment	•"Unable To Follow Instructions" •"Difficulty Decision Making" •"Lack of Insight"	
Degree of Orientation	•"A&O X 1, 1-2, or 2" •"Disoriented" •"Oriented to Self Only"	
Global Descriptors of Confusion	•"Sundowning" •"Confused" •"0 Understanding"	
Behavioral Impairment Categories		
Agitation	•"Agitated" •"Uncooperative"	•"Combative" •"Non-compliant"
Aberrant Motor Behaviors	•"Pulling At" •"Restless"	•"Picking At" •"Fidgets"
Delusions, Hallucinations	•"Delusional" •"Paranoid"	•"Suspicious" •"Hallucinating"
Irritability	•"Labile"	•"Irritable"
Apathy	•"Apathetic"	•"Decreased Motivation"

NEXT STEPS

- Findings provide a preliminary understanding of the potential for unstructured data to complemented existing automated EHR screening approaches
- Future work will focus on validation of an EHR-based phenotype model incorporating structured and unstructured data elements within a well-characterized AD/DR cohort