

Supplementary Table 1. *Description of Studies*

Author(s), Year	Purpose	Data Type	Data Source	Clinical Specialty Setting	Study Population	Number of Patients Used in Study
Bjarnadottir et al, 2018 ⁵³	To explore whether there is meaningful fall risk and prevention information in nurse narrative notes	Nursing notes	Medical Information Mart for Intensive Care (MIMIC)	Inpatient	Patients in critical care units	36,583
Bjarnadottir et al, 2019 ⁵²	To examine what is documented about sexual orientation and gender identity in narrative home care nurses' notes in an electronic health record.	Nursing notes	Visiting Nurse Service of New York (VNSNY)	Homecare	Patients who identify as gay, lesbian, bisexual, and transgender	20,447
Boyd et al, 2018 ⁹	To gain insight into interprofessional care by developing a computational metric to identify similarities, related concepts and differences in physician and nurse work.	Nursing and physician notes	Electronic Health Record data from Cerner Millennium	Inpatient	Patients with congestive heart failure	58
Conway et al, 2019 ⁵¹	To demonstrate the effectiveness of the Moonstone System™ 's semantic processing and inferencing capabilities by extracting and evaluating key measures of social support from the clinical notes.	Nursing notes, social work notes, emergency room physician notes, primary care notes, hospital admission notes, and	Veterans' Health Administration	Inpatient	Patients with congestive heart failure, acute myocardial infarction, pneumonia & stroke	500

		discharge summaries				
De Silva et al, 2021¹⁷	To determine the predictive value of clinical notes as prognostic markers of 1-year all-cause mortality among people with diabetes following critical care	Nursing, physician notes, and both	Medical Information Mart for Intensive Care (MIMIC) III	Inpatient	Patients with Type 1 and Type 2 diabetes following critical care	5942
Fralick et al, 2021⁴⁸	To predict the risk of hypoglycemia using machine-learning techniques in hospitalized patients	Nursing and physician notes	St. Michael's Hospital Electronic Health Record Data	Inpatient	Patients admitted to internal medicine or cardiovascular surgery	16,536
Galatzan et al, 2021⁴⁷	To explore the use of an innovative analysis method to uncover the contextual and linguistic meaning of the nurse-to-nurse change-of-shift hand-off communication	Nursing handoff notes and recordings	Transcribed audio recordings of nursing hand-off reports	Inpatient	Patients in medical surgical unit	Not specified
Gundlapalli et al, 2017⁵⁰	To develop a natural language processing pipeline to extract positively asserted concepts related to the presence of an indwelling urinary catheter	Nursing notes and other provider notes	Veterans' Health Administration	Inpatient	Patients in medicine and long-term care units	1,222
Hajhashemi et al, 2013⁵⁹	To propose a framework for detecting health patterns based on non-wearable sensor sequence similarity	Nursing notes	TigerPlace	Assisted living facility	Assisted-living patients	47
Harkanen et al, July 2019⁴⁶	To explore the extent to which incident reports recorded staffing issues as contributors to medication administration incidents.	Incident Reports	HaiPro	Inpatient	General patient population	1,012

	Incident reports related to medication administration					
Harkanen et al, Nov 2019³⁹	To extract the names of medications most-commonly mentioned in free text descriptions of medication administration incident reports and identify terms most frequently associated with risk for each of these medications.	Medication administration incidents reported by nurses	National Reporting & Learning System (NRLS)	Inpatient	General patient population	72,390
Hatef et al, 2019⁴⁵	To examine the availability and characteristics of social and behavioral determinants of health (SBDH) data captured in the electronic health record (EHR) of a multilevel academic health care system that provides both inpatient and outpatient care to patients with varying SBDH	Physician, nursing, case manager, and social worker notes	Electronic Health Record, University of Maryland	Inpatient, Emergency department, and ambulatory	General patient population	1,188,302
Huang et al, 2021⁴⁴	To investigate and compare the ability of physician and nursing notes, written in the first 48 hours of admission, to predict ICU length of stay and mortality using 3 analytical methods.	Physician and nursing notes	Medical Information Mart for Intensive Care (MIMIC)	Inpatient	Patients in critical care units	6,521
Hyun et al, 2009⁴³	To explore the ability of NLP for capturing nursing concepts on patient safety and quality of care from oncology nursing narratives	Nursing notes	Weill Cornell Medical Center of New York Presbyterian Hospital in New York City	Inpatient	Oncology patients	22

Hyun et al, 2020 ¹⁵	To explore the nursing progress notes of patients in the intensive care unit (ICU) through a text mining method	Nursing notes	Medical Information Mart for Intensive Care (MIMIC) III	Inpatient	Patients in critical care units	Not reported
Karhade et al, 2021 ⁴⁰	To conduct an exploratory analysis to examine the utility of free-text notes generated during the index hospitalization for lumbar spine fusion for prediction of 90-day unplanned readmission	Nursing, physician, & allied health provider notes	Electronic Health Record	Inpatient	Patients with posterior lumbar fusion	708
Koleck et al, May/June 2021 ⁴²	To describe a method that combines standardized vocabularies, clinical expertise, and natural language processing to generate comprehensive symptom vocabularies and identify symptom information in EHR notes.	Clinical notes and abstracts	Electronic Health Record at Columbia University Irving Medical Center	Inpatient, Emergency department, and ambulatory	General patient population	238,026
Koleck et al, Sept. 2021 ¹⁴	To computationally describe symptom documentation from electronic nursing notes and compare symptom clusters among patients diagnosed with four chronic conditions—chronic obstructive pulmonary disease (COPD), heart failure, type 2 diabetes mellitus, and cancer.	Nursing notes	Electronic Health Record at Columbia University Irving Medical Center	Inpatient	Patients with chronic obstructive pulmonary disease (COPD), heart failure, type 2 diabetes mellitus, and cancer	133977
Korach et al, 2019 ¹⁶	To develop a data-driven unsupervised method to discover potential risk factors	Nursing, physician, and allied	Partners' Healthcare,	Inpatient	General patient population	45817

	of rapid response events from nursing notes.	health provider notes				
Lehman et al, 2012 ⁴¹	To propose a novel approach for ICU patient risk stratification by combining the learned topic structure of clinical concepts (represented by UMLS codes) extracted from the unstructured nursing notes with physiologic data (from SAPS- I) for hospital mortality prediction.	Nursing notes	Medical Information Mart for Intensive Care (MIMIC)	Inpatient	Patients in critical care units	14,739
Marafino et al, 2015 ³⁸	To develop and characterize sparse classifiers based on the free text of nursing notes to predict ICU mortality risk and to discover text features most strongly associated with mortality.	Nursing notes	Medical Information Mart for Intensive Care (MIMIC)	Inpatient	Patients in critical care units	25,826
Nakayama et al, 2019 ³⁷	To present a new process to extract structured information from nursing notes through abbreviation normalization, lemmatization, and stop word removal	Nursing notes	A health care system in southeastern United States from 2012-2018.	Inpatient	General patient population	3,036
Neamatullah et al, 2008 ³⁶	To describe an automated Perl-based de-identification software package that is usable on most free-text medical records, e.g., nursing notes, discharge	Nursing notes	Medical Information Mart for Intensive Care (MIMIC)	Inpatient	Patients in critical care units	163

	summaries, X-ray reports, etc.					
Popejoy et al, 2015³⁰	To identify specific care coordination activities used by Aging in Place (AIP) nurse care coordinators and home healthcare (HHC) nurses when coordinating care for older community-dwelling adults and suggests a method to quantify care coordination.	Nursing notes	University of Missouri Electronic Health Record Data	Homecare	Older community-dwelling adults	908
Press et al, 2015³⁵	To use natural language processing (NLP) of text from electronic medical records (EMRs) to identify predictors of communication failure, and to assess the association between communication failure and hospital readmission	Nursing notes	Visiting Nurse Service of New York	Homecare	Patients with congestive heart failure	5,698
Song et al, 2021¹³	To build predictive models to identify a patient's risk of wound infection in homecare	Nursing notes	Visiting Nurse Service of New York	Homecare	Patients with wounds	54,316
Sterling et al, 2019³⁴	To predict final ED disposition using three commonly- employed natural language processing (NLP) techniques of nursing triage notes in isolation from other data.	Nursing notes	Electronic Health Record	Emergency Department	General patient population	256,879
Sterling et al, 2020³³	To predict the number of future required emergency department (ED) resources,	Nursing notes	ED encounters from 2015 to 2016 from 3	Emergency Department	General patient population	144,421

	as defined by the Emergency Severity Index (ESI) triage protocol, using natural language processing of nursing triage notes.		separate clinically heterogeneous academically affiliated EDs (Emergency Department)			
Topaz et al, 2016³²	To develop and validate one of the first automated natural language processing applications to extract wound information (wound type, pressure ulcer stage, wound size, anatomic location, and wound treatment) from free text clinical notes.	Nursing and physician notes	Partners Healthcare System, Boston, MA	Inpatient	Patients with heart failure	101
Topaz et al, 2017³¹	To develop an innovative natural language processing algorithm to automatically identify heart failure (HF) patients with ineffective self-management status (in the domains of diet, physical activity, medication adherence, and adherence to clinician appointments) from narrative discharge summary notes and analyze the association between self-management status and preventable 30-day hospital readmissions.	Nursing and physician notes	Partners Healthcare System, Boston, MA	Inpatient	Patients with heart failure	8,901
Topaz et al, Jan 2019²⁷	To describe the general system architecture and user Interface and present results	Nursing and allied health	Visiting Nurse Service of New York (VNSNY)	Homecare	General patient population	89,459

	of a case study aimed at classifying fall-related information (including fall history, fall prevention interventions, and fall risk) in homecare visit notes.	professional notes				
Topaz et al, Aug 2019²⁹	To identify clinical notes with mentions of alcohol and substance abuse.	Nursing and physician notes	Medical Information Mart for Intensive Care (MIMIC)	Inpatient	Patients in critical care units	50,000
Topaz et al, Nov 2019¹²	To develop and evaluate open-source software (Called NimbleMiner) that allows clinicians to interact with word embedding models with a goal of creating lexicons of similar terms. As a case study, the system was used to identify similar terms for patient fall history from homecare visit notes (N = 1 149 586) extracted from a large US homecare agency	Nursing, physician, and allied health provider notes	Visiting Nurse Service of New York (VNSNY)	Homecare	General patient population	89,459
Topaz et al, Nov-Dec 2020²⁶	To identify patients at heightened risk hospitalization or ED visits using HHC (home healthcare) narrative data (Clinical notes)	Nursing, physician, and allied health provider notes	Visiting Nurse Service of New York (VNSNY)	Homecare	General patient population	89,459
Topaz et al, 2021²⁵	To use natural language processing (NLP) to: (1) Automatically identify	Nursing, physician, and allied	Visiting Nurse Service of New York (VNSNY)	Homecare	General patient population	89,825

	documentation of seven common symptoms (anxiety, cognitive disturbance, depressed mood, fatigue, sleep disturbance, pain, and well-being) in homecare narrative nursing notes, and (2) examine the association between symptoms and emergency department visits or hospital admissions from homecare	health provider notes				
Travers et al, 2003⁶⁰	To propose the construction of concept-oriented nursing terminologies from the actual language used by experts.	Nursing notes	Electronic Health Record, University of North Carolina	Emergency Department	General patient population	39,038
Travers et al, 2013⁵⁸	To implement a new system, Emergency Medical Text Classifier (EMT-C), into daily production for syndromic surveillance and evaluate system performance and user satisfaction. The system was designed to meet user preferences for a syndromic classifier that maximized positive predictive value and minimized false positives to provide a manageable workload.	Nursing and physician notes	North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT)	Emergency Department	General patient population	Not applicable
Waudby-Smith et al, 2018²⁴	To extract the sentimental impressions and attitudes of nurses and examine how sentiment relates to 30-day mortality and survival.	Nursing notes	Medical Information Mart for Intensive Care (MIMIC)	Inpatient	Patients in critical care units	27,477

Woo et al, May 2021 ²²	To examine the value of nursing notes in detecting urinary tract infection (UTI) signs and symptoms in home care	Nursing Notes (visit and care coordination notes)	Visiting Nurse Service of New York	Homecare	Patients admitted with UTI diagnosis	89,459
Woo et al, June 2021 ¹⁹	To create and validate a natural language processing algorithm to extract wound infection-related information from nursing notes. We also estimated wound infection prevalence in homecare settings and described related patient characteristics	Nursing Notes	Visiting Nurse Service of New York	Homecare	General patient population	89,459
Yin et al, 2021 ²⁰	To assess the nature of free-text comments entered EHR flowsheets that supplement quantitative vital sign values and examine opportunities to simplify functionality and reduce documentation burden.	Nursing and allied technician notes	Vanderbilt University Medical Center (VUMC) Vital Sign Comment data from 1/1/2018 to 12/31/2018	Inpatient	General patient population	Not reported
Zhang et al, 2019 ²¹	To examine the association between the medical imaging utilization and information related to patients' socioeconomic, demographic, and clinical factors during the patients' ED visits; and to develop predictive models using these associated factors including natural language elements to predict the	Nursing and physician notes	2012–2016 National Hospital Ambulatory Medical Care Survey ED Subfile (NHAMCS- ED)	Emergency Department	Pediatric patients	27,665

	medical imaging utilization at pediatric ED.					
Zhou et al, 2019¹⁸	To investigate 2 ways to populate a handover form at a nursing shift change automatically for proofing and revising by using domain-specific word representations and using transfer learning models to adapt knowledge from general to clinical English.	Nursing, physician, & allied health notes with voice-to-text notes	National Information and Communications Technology Australia (NICTA)	Inpatient	Patients with cardiovascular, neurological, renal, and respiratory diseases	300