VA AI Inventory – Updated 7/29/2024

The Department of Veterans Affairs (VA) shall, when designing, developing, acquiring, and using artificial intelligence (AI), adhere to the nine principles for use of AI in government as outlined in Executive Order (EO) 13960: Promoting the Use of Trustworthy Artificial Intelligence in Federal Government (Sec. 3). These nine principles describe trustworthy AI as: (1) lawful and respectful of our Nation's values, (2) purposeful and performance-driven, (3) accurate, reliable, and effective, (4) safe, secure, and resilient, (5) understandable, (6) responsible and traceable, (7) regularly monitored, (8) transparent, and (9) accountable.

In accordance with the directives of this EO, the VA has published the following AI use cases.

VA | VA Artificial Intelligence

Use Case ID	Use Case Name	Bureau/Department	Summary of Use Case
VA-01	Machine learning to identify antimicrobial resistance in microbiology reports	Veterans Health Administration (VHA)	Have a machine learning model extract antibiotic susceptibility test results from microbiology report free-text comment box. Microbiology reports are from the VHA Corporate Data Warehouse. Training dataset is manually labelled. This machine learning model can automate (or semi-automate) detection of bacteria that are highly resistant (such as carbapanemase-producing carbapenem resistant Enterobacterales [CP-CRE]). Automating (or semi-automating) CP-CRE test results is helpful to allowed (1) monitor compliance with VHA Directive 1131 and VHA 2019 Toolkit for Control of Carbapenemase-Producing, Carbapenem-Resistant Enterobacteriaceae (CP-CRE), (2) Provide local/regional/national antibiograms (e.g. rates of resistance) of last line antibiotics for epidemiology and clinical ops.
VA-02	SoKat Suicidal Ideation Engine (SSIE)	Veterans Health Administration (VHA)	1. VA Veteran Experience Office (VEO) Enterprise Data Measurement & Analytics obtains feedback via Customer Experience (CX) surveys from Veterans who voluntary provide feedback on VA services. Veterans' responses to CX survey are received (by the Medallia system hosted on an AWS gov cloud outside of the VA firewall. 2. If a survey response includes free-text comments. The comments are screened by a crisis alert detection algorithm (CADA) in real time. The CADA is a rules-driven word filter. It has a high false-positive rate. 3. If a crisis risk is detected, a crisis alert case is created with information from the invitation file (personal and contact details) and the response info (timestamp, free-text comments is .labeled a "Crisis Alert" and forwarded electronically to VA's Office of Mental Health Veteran Crisis Line (VCL) dashboard. in a que. 4. VCL personnel, using the information included in the crisis alert, evaluate the alert to determine if the case was correctly flagged for the risk identified by the CADA. 6. If the crisis risk is corroborated by VCL, the VCL will attempt to contact the Veteran to further assess the risk, provide guidance to the Veteran, and determine what other interventions may be necessary. 7. The outcome and resolution of the VLC work are sent back to Medallia (notes and details), with a label (e.g., false positive, etc.) NAII created an AI pilot contract to assess if an AI/ML/NLP (Long Language) Model (LLM), SSIE would be able to drive down the false-positive rate generated by the CADA (thus reducing VCL workload burden and backlog, saving money by using less staff to triage false positive cases and expedite crisis intervention for Veterans found in need). The model output would be produced for use by VCL staff using a Human Centered Design (HCD) approach. Two reports were targeted as helpful by VCL staff and adopted. Since VLC triaged case outcome are captured in the VCL dashboard as labels. The real labeled data was used to train the SSIE model. The model was also run against datasets not labeled in batch and via live production feed. Three additional VEO-identified requirements for crisis alert utility and effectiveness: R1. Timeliness: Detection must be done fast in real-time. Critical requirement due to severity and timeliness for crisis intervention is short. R2. Safety: Avoid missing real risk (false negative) R3. Efficiency: Minimize false alert (false positive) because of high cost (for VC workload burden) of handling each alert case.

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VA-03	T-SQL Optimization Checker	Veterans Health Administration (VHA)	The VA's data warehouse lives and dies on T-SQL. Unoptimized code negatively impacts users and platform stability. The T-SQL Optimization Checker web application allows programmers to have their T-SQL code checked for optimization issues. The tool provides an immediate code review and alerts the programmer to unoptimized code and other issues. This web application saves programming time, database resources, and provides a second set of eyes as assistive feedback with is helpful to programmers.
VA-04	Precision Pharmacogenomic Perioperative Prediction	Veterans Health Administration (VHA)	Our long-term goal is to design and implement interventions that will improve surgical outcomes. The purpose of the proposed research is to investigate the correlation between the pharmacogenomic and phenotypic patient data and good and poor outcomes so that care decisions can be made to optimize surgical outcomes. Large amounts of pharmacogenomic and phenotypic data have been analyzed by machine learning/ artificial intelligence and has produced interesting results in a number of diverse clinical settings. There has not been much application of this big data machine learning approach to the perioperative state to date. The central hypothesis for the proposed research that will address this gap in clinical care is that pharmacogenomic and phenotypic machine learning will improve risk prediction before surgery, which will enable the future identification of interventions to improve outcomes for our patients.
VA-05	Health Outcomes Military Exposure Living Evidence Analysis Program (HOME-LEAP)	Veterans Health Administration (VHA)	A well-performed systematic review with meta-analysis can take between 1,000 and 2,000 person hours, and these estimates would be considerably higher if adhering to the methodology employed by the National Academies of Sciences or the Cochrane Collaboration. To expedite these reviews, we are leveraging the machine learning capacities of Abstrackr to limit resources spent on scientific article abstract screening. These features, supported by the VA's Airborne Hazards and Burn Pits Center of Excellence, will be available through the Agency for Healthcare Research and Quality's Systematic Data Review Repository (srdrplus.ahrq.gov/). The users will be the public (predominantly healthcare analysts and researchers). The nature of the AI involves various machine learning or AI models. Once they are trained by humans these models will decrease the time spent in simply identifying the relevant research (i.e., the machines "watch" how humans make their decisions and then incorporate that information into the machine-based selection). Data inputs consist of publicly available scientific literature. The data outputs are in development and will help synthesize the available literature on the impact of environmental and occupational exposures on health. The platform used will be housed on srdrplus.ahrq.gov when fully ready. Key Benefits of the project are improved efficiency of scientific literature review and minimizing person-hours for screening
VA-06	CARDINAL - CARDiovascular risk assessment IN ALl Patients	Veterans Health Administration (VHA)	We will use multimodality data (imaging, labs, notes, etc) to predict long-term cardiovascular adverse events and mortality in our patients and help identify patients in which to prevent cardiovascular disease.

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VA-07	Human Capital Management (HCM) Light Electronic Action Framework (LEAF) Geographic Data Cleaning	VA Office of Information Technology (OIT)	We developed a custom Natural Language Processing spaCy Model with Named Entity Resolution and fuzzy matching using Python with an excel-based data cleaning tool for use by the Office of People Science to adjudicate model recommendations and update HCM LEAF.
VA-08	Human Capital Management (HCM) Light Electronic Action Framework (LEAF) Text Analysis	VA Office of Information Technology (OIT)	Application of Natural Language Processing and Machine Learning to identify common topics embedded in the comments logged by HR staff during the recruitment process. This information will later be analyzed by Office of People Science (OPS).
VA-09	Free Text Analysis	VA Office of Information Technology (OIT)	Application of Natural Language Processing and fuzzy matching to parse PDF documents by specified key words that accurately capture the desired data. Created models use statistical and machine learning methods to compare and rank the documents based on similarity to a “source of truth” document.
VA-10	Provider Directory Data Accuracy and System of Record Alignment	Veterans Health Administration (VHA)	Provider Directory objectives are to improve Provider Directory Data accuracy and facilitate more accurate data alignment within internal systems of record. Provider Data accuracy plays a role in every aspect of patient care and a functioning health system. Critical business processes rely on accurate provider data to transfer clinical information, coordinate adequate care, detect abuse, and process claims and payments. Not only is this data necessary to oversee health plans, ensure licensure and proper billing, but it is a critical element of the operation of the VA's community-based care programs offered to Veterans.
VA-11	HIM Coding Computer Assisted Coding	Veterans Health Administration (VHA)	This system is part of the Cerner EHRM. The AI includes interpretation of health record documentation from specific visits for the HIM Professional Coding staff at all EHR Modernized sites. The HIPAA standard code sets as noted in the documentation and supports official coding guidance and application rules that are required for encounter capture and billing.
VA-12	Enterprise-Wide Speech Recognition (EWSR), Medical Speech Recognition (MSR), Dragon Medical One (DMO)	VA Office of Information Technology (OIT)	To ensure the continuation of high-quality and well-documented patient care, VHA utilizes a Medical-Specific Enterprise-wide Front-End Speech Recognition System for non-Radiology applications. VHA holds approximately 12,000 Nuance Dragon Medical licenses, including a variety of versions (i.e., Versions 6.10.x – 10.1.x,). In establishing an enterprise-wide system, VHA is standardizing their approach to non-Radiology speech-recognition software, as well as maintain the most current version of the MSR software across all VHA facilities. Optimizing an enterprise-wide system will improve productivity and user satisfaction of clinicians, reduces costs of transcription, improves accuracy and quality of medical documentation, and ultimately enhances patient-centered care. The system helps with sharing best practices, achieving operational efficiencies, and leveraging economies of scale. Users utilizing speech recognition from a traditional workspace such as a desktop or laptop. Documentation is entered into the electronic health record leveraging voice to text technology. VHA’s healthcare team-facing mobile platform is still under development.

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VA-13	Va.gov Chatbot	VA Office of Information Technology (OIT)	Our Chatbot is a resource to help Veterans quickly find information about VA benefits and services - using Va.gov as the source of content. Veterans won't communicate with and actual representative through the chatbot. Users consist of veterans and caretakers.
VA-14	Outcomes from the National Database of Lymphoid Malignancies in US Veterans Using Data from the Veterans Health Administration	Veterans Health Administration (VHA)	Using medical records available through VINCI, we are using clinical annotation software (MAE) for natural language processing. We are organizing unstructured data to supplement structured data through Corporate Data Warehouse to determine the outcomes of veterans with lymphoid malignancies with and without military exposures.
VA-15	A Machine Learning-Based Application for Informed Clinical Decision-Making (PredictMod): Microbiome-centric Predictive Intervention for Veterans with Pre-Diabetes	Veterans Health Administration (VHA)	Changes in microbiome data from pre-diabetic patients over 4 months will be used in PredictMod software to show response to ketogenic diet intervention. The software will use this data to create an algorithm that will be able to use single time point microbiome data to predict which Veterans with prediabetes would benefit from a dietary intervention, versus which patients would not benefit from a diet intervention and require medication. This tool would help develop earlier, more effective treatment plans for Veterans with prediabetes.
VA-16	Enterprise Precision Scanning and Indexing (EPSI)	VA Office of Information Technology (OIT)	Implement more automated functionality for associating incoming documents with patients/consults. Potentially with VRCS (cover sheets), Optical Character Recognition (OCR) and machine learning algorithms that can scan the documents for patient traits. Determining needs as well as potential use with Community Image View sharing.
VA-17	IVR-VoiceBot	VA Office of Information Technology (OIT)	Exploration into converting existing IVR systems from decision-tree selection experience into a conversational-experience using natural language understanding. This initiative currently impacts VBA/NCC as pilot program, with intentions of expansion to MYVA411 as a component of VA's existing IVR. The main audience is anyone calling the VA. Data inputs include Veteran conversations used to identify the appropriate department to triage phone calls to. Data outputs can include information in APIs as use cases demand.
VA-18	AgileMD eCART Clinical Deterioration Early Warning System	Veterans Health Administration (VHA)	Integrating data from EHR and other data sources to report a new Clinical Deterioration Risk Score to prevent acute care 24 hour mortality, transfer to ICU and requirement to initiator mechanical ventilation.
VA-19	ClosedLoop.ai	Veterans Health Administration (VHA)	Proof of concept via CRADA. End to End platform for auto_ML and low code AI modeling including end user interface design and open source (internally) feature set pipelining and storage.

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VA-20	Machine Learning and other AI tools applied to the Human Capital Data Warehouse (HCDW)	VA Central Office (VACO)	Note that this is a planned capability, not in production at this time: Use machine learning and similar "AI" capabilities of our data warehouse environment (in AWS) to assist with Human Capital-related projections, data mining, and other analytical activities which will enhance the information that we can provide to our human capital executives and stakeholders in the department.
VA-21	Glassbeam	Veterans Health Administration (VHA)	Glassbeam is a leading platform for analyzing complex machine logs generated from medical devices. Multiple health care providers are either using or evaluating Glassbeam for increasing machine uptime, tracking asset utilization, reducing service cost, and increasing operator productivity. Glassbeam solution for Healthcare is delivered using its proven CLEANTM Blueprint (Clinical Engineering Analytics) that provides an end-to-end analytics solution (data collection, data transformation, and data analytics), focusing on integrating machine data with other relevant data sources such as CMMS system etc. in a Biomedical engineering environment. Glassbeam deploys Machine Learning (ML) and Artificial Intelligence (AI) models based on historical data to predict future part failures, including CT tube failures, to minimize unplanned downtime. Applies anomaly detection to identify early warning trends and alert service engineers with a Health Check dashboard per system
VA-22	Medtronic GI Genius	Veterans Health Administration (VHA)	GI Genius appliance is a middleware that sits in between an Endoscopic Scope Processor and the capture workstation. It will draw/highlight a box around potential polyps while conducting an endoscopy procedure, assisting the doctor in identifying potential abnormalities to take note of. The device uses a database of identified growths to continuously compare to whats being fed in to it by the scope's live image.
VA-23	No Show Probability Model using Social Determinants of Health features	Veterans Health Administration (VHA)	We are developing a No Show Predictive Model machine learning model with our Data Science partner Innovet that will incorporate Social Determinants of Health features into the model. The model will be integrated into clinical workflows and depending on feature importance identified for patients, will drive appropriate intervention. For example, patients identified to have socioeconomic disadvantage relating to transportation will be intervened on by care coordinators to help arrange that and overcome barriers.
VA-24	NeuroQuant	Veterans Health Administration (VHA)	FDA cleared software for volumetric MRI processing automated brain image tool
VA-25	Hologic ImageChecker Computer-aided Detection	Veterans Health Administration (VHA)	ImageChecker CAD software, which identifies regions of interest on mammography images to help minimize observational oversights by radiologist
VA-26	FFRangio System (CathWorks Ltd)	Veterans Health Administration (VHA)	Takes angiogram images of coronary arteries that are obtained in the cath lab and uses AI to select the correct frames to estimate the hemodynamic significance of coronary artery blockages

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VA-27	CEREC Ortho Software (Dentsply Sirona)	Veterans Health Administration (VHA)	"CEREC Ortho Software is intended for use with image data acquired from handheld intra oral 3D cameras and desktop laboratory scanners to create 3D virtual models to be used for data acquisition and modeling analysis for orthodontic patients and conditions."
VA-28	Remote, non-contact, monitor using machine vision	Veterans Health Administration (VHA)	We are developing a continuous, non-contact, remote patient monitor that uses machine vision and artificial intelligence to measure heart rate, respiratory rate, pulse oximetry, perfusion, pain, mood, and likely 20 other parameters.
VA-29	Precision Pharmacogenomic Perioperative Prediction (VASQIP)	Veterans Health Administration (VHA)	Our long-term goal is to design and implement interventions that will improve surgical outcomes. The purpose of the proposed research is to investigate the correlation between the pharmacogenomic and phenotypic patient data and good and poor outcomes so that care decisions can be made to optimize surgical outcomes. Large amounts of pharmacogenomic and phenotypic data have been analyzed by machine learning/ artificial intelligence and has produced interesting results in a number of diverse clinical settings. There has not been much application of this big data machine learning approach to the perioperative state to date. The central hypothesis for the proposed research that will address this gap in clinical care is that pharmacogenomic and phenotypic machine learning will improve risk prediction before surgery, which will enable the future identification of interventions to improve outcomes for our patients.

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VA-30	Data-Driven Approach to Predict Catheter Associated Urinary Tract Infections among Hospitalized Veterans	Veterans Health Administration (VHA)	This study is a collaborative nursing research lead by the nurse scientist at VA Long Beach in partnership with a data scientist/nurse researcher from the hospital academic affiliate along with nursing informatics and leadership. In the proposed study, we will utilize the electronic patient data stored in the VA Corporate Data Warehouse (CDW) and assistance from VA Informatics and Computing Infrastructure (VINCI) from the VALBHS to develop and evaluate a data-driven CAUTI prediction model using machine learning / artificial intelligence (AI) techniques to provide personalized, preventive care for the Veterans. Predictors of interest include structured coded data from the VA CDW including patient demographics, diagnoses, procedures/treatments, medications, comorbidity score, medical history, and length of inpatient stay. We will also collect clinical narrative notes (nurses' progress notes, physician's notes, and pathology report), as well as nursing data. We will utilize a natural language processing (NLP) approach to extract the features relevant to CAUTIs from the clinical notes. Then we will integrate the extracted features with the structured CPRS data (i.e., coded data) from VA CDW. The resulting data will then be transformed into a format that is needed for the model of interest, such as unit conversion, normalization, grouping, etc. Once this process is completed, the processed data will be exported into a flat file. Then, we will apply feature engineering based on the characteristics and statistics of the raw features. We will also apply one-hot encoding to transform each categorical value into a new categorical column and assign a binary value of 1 or 0. For the effectiveness of the training, we will check if all the features are providing positive impact to the training. A low-variance feature does not improve overall performance; thus, it will be filtered out during the feature engineering step. Also, we will build a simple model with every feature and determine which feature contributes to the prediction performance the most. We will then use this information to perform "feature selection" to reduce the number of final features to be used. This prediction model can be used as a clinical decision support tool that provides real-time information for CAUTI prevention reflecting the individual's characteristics from CPRS to ensure the timeliness and accuracy of patient care decisions.
VA-31	PREDICTED LONG-TERM INSTITUTIONALIZATION (PLI) MEASURE	Veterans Health Administration (VHA)	This is a measure developed from VA and Medicare data that provides the probability of a two year long-term institutionalization in a nursing home. This information is needed in order to target services to Veterans who are at risk of needed nursing home care. The VACO geriatrics and extended care (GEC) needs this information for their recap demonstration project. Other users of the measure are researchers and operations individuals who use this measure as a risk adjuster.

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VA-32	Claims Profile	Veterans Benefit Administration (VBA)	The Claims Profile project will use Artificial Intelligence (AI) technology to build computable Veteran claim profiles from historical data of over 700 claimed disabilities. These profiles will enable adjudicators to assess new claims in the context of historical precedent in order to reach a decision more accurately, more quickly, and more transparently. Instead of the "random sampling" that we do today, every claim can be checked against thousands (or more) or similar cases. Not only would this tool methodically and reproducibly accelerate decisions, but it would also provide the adjudicator a way to compare claims to prior decisions. By leveraging recent advances in information modeling, every claim would add to our knowledge base. Additionally, the computable profiles will be comprised of demographic, service history, health history, and medically evaluated service-connected disability. The overall goal of the feasibility study and prototype is to demonstrate how similar claims produce similar results, to better understand where deviations and differences may occur, and to create a baseline that future claim decisions can be compared against. This will support VBA's ability to identify disparities in claims outcomes for different populations and equip the agency with information to correct noted disparities.
VA-33	Business Transformation Platform (BTP)	Veterans Benefit Administration (VBA)	The Business Transformation Portfolio (BTP) automates the control of mail received for Department of Veterans Affairs (VA) benefits into VA systems. BTP also automates several claim processes including creating letters, summarizing claim relevant information from the eFolder and updating claim statuses. Users benefited by the system include Claims Assistants, Veteran Service Representatives and Rating Veteran Service Representatives. The automation utilizes multiple technologies including Optical Character Recognition, Intelligent Character Recognition, Natural Language Processing, Robotic Processing Automation, Neural Net Processing, Robotic Processing Automation and Application Programming Interfaces. Data inputs include information extracted from documents received from claimants and the eFolder as well as data received through application programming interfaces such as VA.gov and the Health Data Repository. Data outputs include information to establish claims, update VA systems, summarize eFolder documents and generate reporting. The AI is provided through the Business Transformation Platform developed by IBM. Key benefits are the automated control and upload of over 70% of disability claim mail in less than 24 hours. The automation also has the key benefit of being able to review thousands of pages of documents in the eFolder and upload a summary document of pertinent information supporting the claim.
VA-34	Deep learning of sinus rhythm 12-lead ECGs in Veterans to detect concurrent paroxysmal atrial fibrillation	Veterans Health Administration (VHA)	Retrospective deep learning analysis of 12-lead ECGs in sinus rhythm from veterans within our system to predict paroxysmal atrial fibrillation. Findings may inform future screening efforts for undetected occult atrial fibrillation which may influence medical management and limit complications associated with unidentified atrial fibrillation.

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VA-35	Crisis Alert Algorithm	VA Central Office (VACO)	Crisis Alerts: VSignals is supporting crisis response teams to intervene in concerns of suicide, homelessness, and sexually based concerns, we utilize Medallia natural language processing and text analytics keywords and rules to identify free text responses which are most closely related. PATS-R: VSignals is supporting patient advocates to identify and respond to veterans in need of service recovery. We utilize action intelligence features designed to enable actionable adaptive intelligence in customer experience programs. Data related to actual responses gets sent to PATS-R via a scheduled S3 data transfer with the necessary information for patient advocates to complete their service recovery.
VA-36	GI Genius	Veterans Health Administration (VHA)	We are trying to purchase software that enhances polyp detection on colonoscopy. We tried to get in on the initial VA central GI rollout but other folks jumped in faster. So we are trying to purchase it on our own.
VA-37	Philips Medical Systems, Ingenia Magnetic Resonance Imaging System	Veterans Health Administration (VHA)	Users: Radiographic Technicians Nature: The system can use combinations of imaged to produce physical parameters, and related derived images. Imaged and measurements of physical parameters, when interpreted by a trained physician, provide information that may assist diagnosis and therapy planning. The accuracy of determined physical parameters depends on system and scan parameters and must be validated by the clinical user. Platform: Proprietary Medical Device Benefits: Essential medical diagnostic system
VA-38	Comment Clustering	VA Central Office (VACO)	Comment Clustering is an Artificial Intelligence use case that automatically groups comments into topic groups based on the free text in the comment. The comments in question are pulled from VEO surveys with free text, and outputs unlabeled clusters of comments. An individual labels these clusters based on the comments therein. This allows us to cluster and label free text comments as they come in without pre-defining rules. This also allows us to change our labeling schemes on a monthly basis, adapting to trends in comments as they emerge.
VA-39	Sentiment Model	VA Central Office (VACO)	Our Random Forest Sentiment Analysis Algorithm pulls in free text comments and assigns a number indicating likelihood that the comment is a compliment. This allows us to combine multiple sources of data and fine tune a model that will give us another output denoting positivity or negativity, so as not to miss mislabeled comments.
VA-40	Improving dermatology access by direct-to-patient teledermatology and computer-assisted diagnosis	Veterans Health Administration (VHA)	This is an HSR&D-funded research project that leverages patient-submitted skin images from VA's My VA Images teledermatology app to develop and train a computer vision system that ultimately is intended to provide diagnostic classification probabilities for use as decision support tool for non-dermatologist providers and patients.
VA-41	Clinical outcomes for asynchronous teledermatology	Veterans Health Administration (VHA)	This is an NLP project that will use deep learning approaches to analyze clinical progress notes from the EHR to classify them with respect to clinical outcomes. It is intended primarily as a research resource, but might potentially find use as a dashboard for clinical leadership to guide policy and practice of processes such as teledermatology.

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VA-42	Image quality assessment and diagnostic classification	Veterans Health Administration (VHA)	This project seeks to use both analytical and deep learning approaches to assess image quality and provide diagnostic classification of patient-generated skin images. The ultimate goal is to integrate these capabilities into VA's My VA Images and VCM apps to enhance image quality and provide a clinical decision support tool
VA-43	Robotic Process Automation (RPA) use in Community Care	Veterans Health Administration (VHA)	The Community Care Service uses Robotic Process Automation (RPA) to perform work that is routine and repetitive in nature. While there is potential for increased usage, we are currently using RPA to download incoming faxes, upload medical documents to patients medical charts after clinical review is complete, create notes in patients medical charts when requests for additional care need to be review by VA doctors, alert VA doctors to changes in the status of a consult and send denial letters to patients and community providers when requests for additional care are denied by a VA provider.
VA-44	Medtronic GI Genius™ Intelligent Endoscopy Module	Veterans Health Administration (VHA)	Computer aided polyp detection system. Medtronic claims it is powered by AI. This is a small, stand alone device used in the surgical setting for endoscope proceedures. The connection is video signal in and video signal out. End users would be surgical staff. (GASTROINTESTINAL ARTIFICIAL INTELLIGENCE) https://www.medtronic.com/covidien/en-us/products/gastrointestinal-artificial-intelligence/gi-genius-intelligent-endoscopy.html
VA-45	PPO 22-191: Precision Pharmacogenomic Perioperative Prediction	Veterans Health Administration (VHA)	Will modernize preoperative risk assessment with the VA Surgical Quality Improvement Program using pharmacogenomics from the Million Veterans Program starting with vascular and cardiac surgeries and will use machine learning and artificial intelligence methods leveraging the phenomic databases from VHA with a goal of improving outcomes after surgery.
VA-46	Open AI, https://chat-gpt.org/chat	Veterans Health Administration (VHA)	Support drafting form letters, blog stories, social media posts, fact sheets, and other miscellaneous content.
VA-47	Data-Driven Methods to Identify Social Determinants of Health	Veterans Health Administration (VHA)	There is increased attention on social determinants of health (SDOH) because of empirical evidence showing that the patient's social background is associated with their health behaviors and clinical outcomes. A systematic approach that moves beyond identifying patients who have social risk factors is needed for Health information technology (HIT) to be effective at addressing minority health and health disparities. Our project will use HIT to address the SDOHs that contribute to health disparities in minority populations and other medically underserved groups. We will use NLP methods and deep learning strategies of transformer based language models to determine the extent to which SDOH are documented in EHRs. The users of the system are researchers on the project that are assessing the identification of SDOH in the medical record. The inputs are clinical notes annotated with SDOH mentions that are used to train the model. The output are predictions of SDOH in clinical notes that will be assessed using gold standard hold-out data sets. The VINCI platform is used to run the analysis for the study. The benefit will be improved understanding and knowledge of SDOH in the medical record and how they are associated with clinical outcomes.

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VA-48	(IIR 19-414: Understanding the effect of rurality and social risk factors on barriers to care and surgical outcomes)	VA Central Office (VACO)	We are studying the social determinants of surgical outcomes in a cohort of Veterans whose surgery cases were abstracted into VASQIP, linked to Area Deprivation Index, USVets data, race/ethnicity and measures of care fragmentation. Our primary analysis uses logistic regression, but we are using machine learning approaches (gradient boosting and forest trees) to ascertain if these approaches add insight not revealed through standard parameteric models. Thus far, they have not provided new or additional insight. We are NOT using artificial intelligence, per se., and thus unclear how to answer your questions below in #8-10
VA-49	Developing Models to Identify Veterans with Nonalcoholic Fatty Liver Disease and Predict Progression	Veterans Health Administration (VHA)	Non-alcoholic fatty liver disease (NAFLD) is a significant and growing health problem closely linked with the metabolic syndrome (obesity, type 2 diabetes mellitus (T2DM), hypertension, and dyslipidemia). Left untreated, NAFLD can lead to life threatening and costly cirrhosis and liver cancer. Our project will use machine learning models using demographic and clinical variables, including fibrosis risk scores from Veterans with a history of NAFLD, in order to identify high-risk subgroups including those with risk of short term mortality. The users of the system are the researchers on the project that are assessing high-risk groups of patients with NAFLD. The inputs are clinical variables and lab values of patients with NAFLD, and the outputs are predictions of high-risk groups for cirrhosis, hepatocellular carcinoma, or mortality. The VINCI platform is used to run the analysis for the study. The benefit will be improved understanding and knowledge about high-risk groups of patients with NAFLD.
VA-50	Identification of COVID cases in Veterans diagnosed outside of the VA healthcare system	Veterans Health Administration (VHA)	The system processes clinical notes from the electronic health record to identify when Veterans are diagnosed with COVID infection in the community (non-VA) setting including other healthcare systems or health departments. Users are the users of VA National Surveillance Tool. VA and community cases are tracked separately to provide an overall picture of the burden of the pandemic on Veterans.
VA-51	We use a variety of machine learning tools for preclinical models of traumatic brain injury and spinal cord injury.	Veterans Health Administration (VHA)	Research--we use a wide variety of open source tools on our University laboratory research computers (not VA computers).
VA-52	VA Clinical Research and Development Merit Review Board funded research 0001614 Systems Biology Approach to the Therapy of Chronic Kidney Disease Mineral Bone Disorder	Veterans Health Administration (VHA)	Artificial intelligence techniques are being employed to develop phenotypic classifications of individuals with chronic kidney disease at high risk for cardiovascular or skeletal complications, to identify the major contributors to these complications, and to test therapies.
VA-53	Virtual Reality goggles for Recreation Therapy veteran activities.	Veterans Health Administration (VHA)	Virtual Reality goggles. Assists patient with recreation therapy interventions.

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VA-54	Lung Imaging based Risk Score (LunIRIS): Decision support tool for screening CT	Veterans Health Administration (VHA)	In this study we propose to continue to optimize our computerized decision support technology, Lung Imaging based Risk Score (LunIRiS), to assign a risk score of malignancy to a nodule on a chest CT scan. Dr. Anant Madabhushi is the PI of this work. Dr. Madabhushi has developed a lung cancer discrimination tool (LunIRiS) and is working on deployment to the Cloud. LunIRiS will enable radiologists to upload a CT scan, designate the nodules and regions of interest, and LunIRiS will extract intra-nodular and peri-nodular texture features and corresponding textural maps. Then, radiologists can get a report from LunIRiS that computes the radiomic features of the uploaded scan and can retrieve the most similar nodules from the database. LunIRiS will also provide a decision on whether a nodule is an adenocarcinoma or granuloma. Following the successful completion of this project, LunIRiS will be evaluated for clinical workflow improvement in select VA stations for lung cancer screening. We expect to show that LunIRiS can reduce cost and morbidity associated with frequent repeat follow up CT scans and invasive surgical biopsies in VA patients undergoing lung cancer screening.
VA-55	AI/NLP to extract Eastern Cooperative Oncology Group (ECOG) and Karnofsky performance status (KPS) from cancer notes	Veterans Health Administration (VHA)	The AI/NLP algorithm extract ECOG or KPS from the free text notes for the cancer patients. It automate the process.
VA-56	using NLP to extract sleep parameters from PSG and HSAT	Veterans Health Administration (VHA)	it use NLP to extract sleep parameters such as total sleep time, sleep efficiency, WASO, SOL, AHI, etc from patients free text notes
VA-57	using AI/ML to develop a frailty trajectory	Veterans Health Administration (VHA)	we are developing AI/ML algorithm to estimate the frailty index and then we developed the frailty trajectory
VA-58	IIR 19-118: Development and Validation of a Cirrhosis-specific Surgical Risk Calculator (C-SuRC)	Veterans Health Administration (VHA)	Using Veterans Affairs Surgical Quality Improvement data and medical records, we identified 10,446 Veterans with cirrhosis who received an elective or emergent surgical procedure from 1/1/2015-9/30/2021. We developed and internally-validated XGBoost machine learning models to predict 30-day postoperative mortality
VA-59	CellaVision DM 1200	Veterans Health Administration (VHA)	DM1200 is an automated cell-locating device. DM 1200 automatically locates and presents images of blood cells on peripheral blood smears. The operator identifies and verifies the suggested classification of each cell according to type. DM1200 is intended to be used by skilled operators, trained in the use of the device and in recognition of blood cells. The peripheral blood application (PB) is intended for differential count of white blood cells, characterization of red blood cell morphology and platelet estimation. The system automatically locates and presents images of blood cells on peripheral blood smears. The operator identifies and verifies the suggested classification of each cell according to type.

Use Case ID	Use Case Name	Bureau/Department	Summary of Use Case
VA-60	Planned use of AI/ML to for exploratory analysis of magnetic resonance imaging (MRI) data	Veterans Health Administration (VHA)	Planned use Users: Researchers Nature of AI: exploratory use (feature space and 'attention' focus; explainable AI) Data inputs and outputs: Human MRI data Platform: TBD, likely MONAI running on DGX-A100 nodes Key benefits: Identify novel structural targets or disease correlates Ongoing use Users: Researchers; In future, clinical tool for more complete/comprehensive pathology assessments and/or disease tracking. Nature of AI: Segmentation, identification, derivation of standard pathology measures Data inputs and outputs: Human MRI data; human postmortem brightfield whole slide images; animal MRI and lightsheet microscopy data with and without labels/probes. Platform: MIT Supercloud (modified version of neuroglancer for front-end); UF HiPerGator DGX-A100 nodes Key benefits: research platform for basic research, clinical prognosis/disease etiology research, etc.
VA-61	Can suicide theory-guided natural language processing of clinical progress notes improve existing prediction models of Veteran suicide mortality?	Veterans Health Administration (VHA)	We are attempting to extract signals of suicidal risk from clinical progress notes using natural language processing. These signals will be evaluated in terms of predictive validity compared to VA's current risk prediction methods.
VA-62	Artificial Intelligence to Resolve Heterogeneity of Heart Failure with Preserved Ejection Fraction and Enable Precision Care	Veterans Health Administration (VHA)	In collaboration with DOE scientists (Daniel Jacobson, Group Leader), we will use AI/ML techniques to cross-sectional and longitudinal clinical data and -omics data to sub-phenotype a less understood form of heart failure and find targets for prevention and treatment and predictive models.
VA-63	Implementation of Natural Language Processing, Predictive Modeling and Artificial Intelligence Methods and Findings to Improve REACH VET Suicide Prediction	Veterans Health Administration (VHA)	Predicting suicide from clinical records (research project)

Use Case ID	Use Case Name	Bureau/Department	Summary of Use Case
VA-64	Utilizing Machine Learning Approaches to Improve Veteran Lung Cancer Care	VA Central Office (VACO)	We propose to use natural language processing and deep survival machines to model the outcomes of Veterans treated within the VA healthcare system with lung cancer who receive immunotherapy. The inputs are the structured and unstructured inputs from the CDW data repository. We will develop these language models and survival models within the Department of Energy high performance cluster at Oak Ridge. If completed, we will develop patient and provider facing tools which help guide shared-decision making conversations and inform therapy selection in Veterans with lung cancer.
VA-65	A Genetic Algorithm (GA) to reverse the recruitment order of axons during electrical nerve stimulation	Veterans Health Administration (VHA)	This project has not yet started so some of these details remain unknown. The purpose of this project is to use a genetic algorithm to redesign the distribution of electrodes within a cuff that fits around a nerve in an effort to reverse the order in which axons are recruited. The body normally recruits axons from smallest diameter to largest diameter, but electrical stimulation recruits in the opposite direction and this is often undesirable within for electrical nerve stimulation applications. The reversed recruitment makes restoring fine motor control very challenging or impossible. The reversed recruitment also reduces the useable time of the prosthesis before muscles become fatigued. Muscle fatigue is a major concern for lower extremity prostheses in which electrical nerve stimulation is used to restore standing in a paralyzed individual. Dr. Schiefer and a student (Julianne Do) will be involved with the project. Other students or collaborators may be added as time goes on if results are promising. Simulations will be run on the University of Florida's high performance compute cluster ("HiPerGator"). Simulations will include the GA and simulations of axons' responses to stimulation. Most or all coding will be done in MATLAB.
VA-66	Rapid AI	Veterans Health Administration (VHA)	This application is used by Radiology and Radiologists. The AI screens brain CT (Computerized Tomography) scans as data inputs. The AI reviews the scans for suspected stroke events and outputs a report with the results of the review identifying suspected perfusion abnormalities. This AI system uses the DICOM compliant images created by a CT scanner and the resulting output is sent to the existing commercial PACS (Picture Archiving and Communication System) for review by the interpreting Radiologist. The key benefits of this AI are increased detection rate of potential strokes that may be missed or disregarded by the Radiologist, potentially aiding in better outcomes for Veteran patients.
VA-67	ClearRead CT	Veterans Health Administration (VHA)	This application is used by Radiology and Radiologists. The AI screens chest CT (Computerized Tomography) scans as data inputs. The AI reviews the scans for suspected lung nodules and outputs a report with the results of the review identifying suspected lung nodules. This AI system uses the DICOM compliant images created by a CT scanner and the resulting output is sent to the existing commercial PACS (Picture Archiving and Communication System) for review by the interpreting Radiologist. The key benefits of this AI are increased detection rate of potential malignant lung nodules that may be missed or disregarded by the Radiologist, potentially aiding in better outcomes for Veteran patients.

Use Case ID	Use Case Name	Bureau/Department	Summary of Use Case
VA-68	Predict surgical procedure length/Predict inpatient length of stay	Veterans Health Administration (VHA)	This project is for development of a proof of concept, using a regression machine learning process to make two predictions: Surgical procedure length and Inpatient length of stay. Inaccurate estimates of surgical procedure duration impact not only that patient, but every patient scheduled for the same operating room for the remainder of the day. Because these estimates determine supplies on-hand underestimating duration can directly impact patient outcome. The effect of poor estimates cascade through the day resulting delayed or canceled procedures with related impact on healthcare delivery and patient satisfaction. Delays can cause transportation problems resulting in patient staying in hospital an extra day with corresponding cost. Unnecessary prolongation of inpatient stay not only contributes to patient dissatisfaction but has patient safety implications such as increased risk of hospital-acquired infections. Every additional inpatient day has its associated costs, and these are compounded by costs incurred by treatment of medical complications. The ability to predict inpatient length of stay will allow clinical leaders to identify patients who are likely to have extended stays, and the likely reasons for the delay of their discharge. This will allow earlier initiation of discharge delay mitigation activities, thereby reducing patient risk and medical center operating costs. A general reduction in patient length of stay increases access to care for all patients. The technology will use VA's Arches research, development and innovation environment and will be developed by H20.ai in a no-cost, proof of concept collaborative effort with VISN 5 Clinical Informatics.
VA-69	Tucson VA Anesthesia Devices	Veterans Health Administration (VHA)	Air Next from NuvoAir AB Compumedics Sleep Monitoring System from Computmedics Sleep MATRx Plus from Zephyr Sleep SnoreSounds from Appian Medical

Use Case ID	Use Case Name	Bureau/Department	Summary of Use Case
VA-70	Protocol # 1658132 (Dr. Sutton) Knowledge discovery and machine learning to elucidate the mechanisms of HIV activity and interaction with substance use disorder.	Veterans Health Administration (VHA)	People living with human immunodeficiency (PLWH) and with a substance use disorder (SUD) disproportionately suffer from high mortality, often from non?HIV-related causes such as overdose, accidents, and suicide. Drugs of abuse increase the severity of HIVAssociated Neurocognitive Decline (HAND) by several potential biological mechanisms. HIV associated cognitive deficiencies in conjunction with SUD decrease engagement in HIV care, which fuels a worsening downward spiral of health status. Unfortunately, there is no approved therapy for the treatment of HAND and particularly for the combined neurological effects of HIV and drugs of abuse. The overall purpose of this study is to develop and apply an integrative artificial intelligence (AI)-based approach to analyze biomedical data and electronic health records to determine new mechanisms of HIV and drugs of abuse interactions, and to discover repurposed drug candidates for the treatment of HIV-infected SUD patients. This national retrospective cohort study, in part, will be conducted using data from the United States Department of Veterans Affairs (VA). The Veterans Affairs Informatics and Computing Infrastructure (VINCI) will be utilized to obtain individual-level information on demographics, administrative claims, and pharmacy dispensation.
VA-71	Protocol # 1482542 (Dr. Hoque) Mapping and predicting the impact of patient level data on the effects of FDA warnings for ESAs: uncovering the hidden world of Serious Adverse Drug Reactions with Neural Networks	Veterans Health Administration (VHA)	The proposal will lay down the framework for applying neural networks to map out the influence of patient – level data on the effects of FDA warnings. It will focus on the usage of erythropoiesis stimulating agents. The hypothesis is, “Neural networks can map and predict the influence of the multi – dimensional space incorporating demographics, socio – economic status and clinical diagnosis on ESAs usage and FDA warnings”. The proposal will lay down the framework for applying neural networks to map out the influence of patient – level data on the effects of FDA warnings. It will focus on the usage of erythropoiesis stimulating agents. Specific aim 1 will build two networks: Feed forward multilayer neural network (MLNN) and recurrent neural network (RNN). Feed forward MLNN is a robust architecture successfully applied across diverse disciplines. A variant of it is RNN and it will account for sequential data. Specific aim 2 will explore deep learning NNs. Deep learning NNs has the advantage of being able to use ‘raw data’ as input. The study will avail the database of cancer patients from Veterans Affairs. The proposed innovative study seeks to revolutionize the response to sADR events.
VA-72	Randomized, double-blind, placebo controlled study of ALTO-100	Veterans Health Administration (VHA)	This is proprietary technology and software owned by the industry sponsor. I have been advised by Michael Kim, NAII Chief of Staff to fill out this survey to the best of my ability, notating where technology and software is not ours and is proprietary / information is protected in a CDA/NDA. I am unable to input dates appropriately below therefore they are 100% incorrect. A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED STUDY OF ALTO-100 WITH AN OPEN-LABEL EXTENSION IN ADULTS WITH MAJOR DEPRESSIVE DISORDER
VA-73	MD Clone ADAMS www.mdclone.com	VA Central Office (VACO)	Innovation Specialist, Laura Henry, and data nurses Amy Larsh, Eneke Smith and Andrea Hepburn as well as TCF Intern, Christy Turner, are exploring its usability/function with these ICD 10 codes: A41.9 sepsis unspecified, R65.21 severe sepsis, N17.9 acute kidney failure, R65.20 organ dysfunction (acute) (multiple) R65.20 with septic shock R65.21

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VA-74	Application of Machine Learning to Enhance e-Triggers to Detect and Learn from Diagnostic Safety Events	Veterans Health Administration (VHA)	Rules-based electronic trigger tools mine clinical data to identify signals for possible diagnostic error, but they have imperfect predictive value. This is an IRB-approved study to apply machine learning to the expert-labeled output of rules-based triggers, to make a two-stage diagnostic error detection process with high throughput but improved specificity. Users are researchers only; no interaction with any patients or clinicians.
VA-75	Linking VA and Non-VA Data to Predict the Risk of Suicide Among Veterans Receiving Chronic Opioid Therapy	Veterans Health Administration (VHA)	This is a research study in partnership with the Philadelphia VA and Cornell University, funded by an NIMH grant. The study applies machine learning algorithms on electronic health record data for Veterans under VA care and those receiving care in academic medical centers across New York City, Chicago, and the state of Florida. The study will link these VA and non-VA data to predict the risk of death from suicide and accidental opioid overdose, suicidal ideation, and suicide attempts among Veterans receiving chronic opioid therapy, using machine learning methods and natural language processing. Key Benefits: The study will create prediction algorithms using combined VA and non-VA data to identify Veterans on chronic opioid therapy at high risk of death (suicide and accidental opioid overdose), and suicidal ideation and attempts.
VA-76	Riverain Techologies - ClearRead	Veterans Health Administration (VHA)	The Riverrain Technologies ClearRead software would be the closest thing to AI that we recently acquired but that would still be used for decision support and not independent diagnosis of lung disease. It is currently on an OIT server but will be migrated to the local biomed virtual machine farm by the end of April 2023. Reference dates listed in later questions are approximations. Riverain's ClearRead solutions significantly improves a clinician’s ability to accurately and efficiently detect disease in thoracic (lung) CT and XR images and more successfully address the challenges of early detection of lung disease.

Use Case ID	Use Case Name	Bureau/Department	Summary of Use Case
VA-77	Development of a Convolutional Neural Network to Detect Abdominal Aortic Aneurysms in the Veterans Population	Veterans Health Administration (VHA)	Artificial intelligence (AI) corresponds to the ability of a computer to perform tasks that are commonly associated with human thought. A version of AI termed machine learning allows us to discover patterns and to make decisions from large data sets without the need of programmed instructions or assumptions. Convolutional Neural Networks (CNN) have gained attention in the medical community for solving computer-based visual tasks, including image analysis, object identification, categorization and segmentation. The goal of this study is to propose a methodology and algorithm to train a robust foundational CNN, independent of human manual input, for identifying computed tomography angiography (CTA) scans for the presence of infrarenal abdominal aortic aneurysms in the veteran population, which may allow future predictive modeling and other artificial intelligence applications. Study period (from which CTA will be included for imaging analysis) will be from January 1, 2000 to December 31, 2020 STUDY GOALS and OBJECTIVES 1. Develop an algorithm to train a robust foundational CNN, independent of human manual input, for identifying CTA scans for the presence of abdominal aortic aneurysms in the veteran population 2. To teach and refine the developed CNN for diagnostic accuracy
VA-78	Endosoft Argus AI Polyp Detection & Sizing Decision Support	Veterans Health Administration (VHA)	Users: All providers/clinicians/surgeons who utilize the Endosoft EndoVault system with our Olympus Endoscopy scopes and processors. Argus® is launched during the endoscopy procedure to aid in the decision making of polyp detection and sizing. Argus® detects the polyps utilizing artificial intelligence and machine learning while capturing images simultaneously. Argus® brings a one of a kind AI approach to the gastroenterology field. Vendor and scope neutral, Argus® offers the only AI detection and sizing decision support solution on the market. In a recent study, the assistance of Argus® increased polyp detection by 19%. Data Input: Video feed from Olympus processor Data Output: Video screen capture (pictures) for inclusion in procedure reports; 'Argus video screen' provides highlighted circles in real-time around suspected polyps as a recommendation for the user to investigate. Final determination of polyp removal lies entirely with the clinician. Dates provided below are educated guesses for those prior to installation.
VA-79	Nuclear Medicine applications for advanced image analysis and therapy planning or dosimetry	Veterans Health Administration (VHA)	Multiple clinical applications indicate the use of AI in diagnostic imaging and related quantitative analysis that might include a longitudinal component, as well as therapy planning and dosimetry, such as volume of interest determination and segmentation of normal or target structures; items are FDA approved

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VA-80	AI/ML Enabled Medical Devices - radiology	Veterans Health Administration (VHA)	All three of these items are in radiology devices. They likely have some functionality in the enhanced diagnosis of any illnesses found in the images taken. • Aquilion ONE Canon CTs (x2) • Achieva Philips MRI (x2) • EPIQ Series Diagnostic Philips Ultrasound Systems (x5) These all are AI capable per the AI/ML Enabled Medical Devices list posted by the FDA
VA-81	Elucidating Genetic and Environmental Risk Factors for Antipsychotic-induced Metabolic Adverse Effects Using Artificial Intelligence and Machine Learning	Veterans Health Administration (VHA)	This is a research project to use AI to identify risk factors for metabolic side effects (weight gain, diabetes, hypercholesterolemia, etc.) in patients receiving antipsychotic medications.
VA-82	Dynamic Prediction of Short-Term and Long-Term Diabetes Complications Leveraging Massive Electronic Health Records, Million Veteran Project, Machine Learning/Artificial Intelligence, and High-Performance Computing	Veterans Health Administration (VHA)	This is a VA/DOE funded grant to predict diabetes complications using the VA CDW data. this proposal will use standard machine learning algorithms (already available) for unbiased selection of variables in prediction models; there is no other planned AI activity. Users will be VA staff or WOCs. We will using VINCI platform and DOE servers (KDI). Benefits will be to better predict complications of diabetes, hopefully paving the pathway in future to identify patients that may need more medical attention.
VA-83	Radiology Research	Veterans Health Administration (VHA)	Analyses of research medical images by staff research scientists toward identifying new markers of disease progression. Nature of AIs is primarily radiomic features coupled with logistic regression models. Data inputs are medical images (CT, MRI) obtained under appropriate IRBs. Platform is an in-house GPU server with python and anaconda. Key benefits include the ability to explore features in radiology images that may be able to predict disease progression and that are not otherwise readily identifiable as are, for example, aneurysm diameters or hyper/hypointensities of tissues in a given medical imaging modality.
VA-84	Digital Command Center	Veterans Health Administration (VHA)	Digital command center to centralize data within a VAMC and to provide predicative and prescriptive analytics to improve hospital operations. When complete, the system will pull from any data source that affects a VAMC and provides output that can be accessed by anyone with login information as well as being displayed at key locations across the facility. Implementations at non-VA facilities have seen 5-20% improvements across most operational efficiency related metrics.

Use Case ID	Use Case Name	Bureau/Department	Summary of Use Case
VA-85	Curapatient (CuraVet)	Veterans Health Administration (VHA)	Cuapatient is a tool that will allow for better asynchronous communication between provider and patient and allow for better management of long term chronic conditions. Long COVID is the first use case. The system will allow veterans to enter information directly into the EHR and will allow for analytics to occur. Provider can preload information to share with patient and can monitor patients better than with other systems.
VA-86	Improving Stroke and Transient Ischemic Attack Risk Stratification Using Left Atrium and Left Atrial Appendage Shape Features	Veterans Health Administration (VHA)	This is a proof-of-concept retrospective study which will hopefully culminate in a research publication. We are attempting to build a pipeline of AI models (e.g., segmentation) which will produce a measure of stroke risk leveraging features extracted from medical imaging data. Input data will include cardiac-gated CT imaging and features extracted from EHR through chart review by clinician researchers. The output will be stratification of stroke risk. Key benefits include better identification of at-risk Veterans, and more informed clinical decision making.
VA-87	IRB approved research study Protocol 1593816 (Migrino 1043) Machine learning tools to predict outcomes of hospitalized VA patients	Veterans Health Administration (VHA)	PI Raymond Migrino and collaborators using VA data in VINCI and ARCHES platform to look at prediction of clinical events using electronic health records data. The research is aimed at looking at early prediction of clinical events such as dementia from EHR data.
VA-88	Riverain ClearRead AI Solution	Veterans Health Administration (VHA)	This AI platform provides bone suppression for X-ray images to improve diagnostic abilities in soft tissues. This is used by facility radiologists in their reading process. The AI identifies areas considered to be bone in the dicom images input to the system, alters the images to remove the bone interference of soft tissue, and outputs the modified dicom images. The platform to review these images are on a PACS system that receives the modified images back from the Riverain server.
VA-89	K210484, LINQ II Insertable Cardiac Monitor, Zelda AI ECG Classification System.	Veterans Health Administration (VHA)	The software uses AI to assist in anomaly detection for patients, in this case, highly used to detect atrial fibrillation in the prevention of strokes.
VA-90	K162855 - Reveal LINQ	Veterans Health Administration (VHA)	The software uses AI to assist in anomaly detection for patients, in this case, highly used to detect atrial fibrillation in the prevention of strokes.
VA-91	Vitrea Advanced Visualization	Veterans Health Administration (VHA)	AI to be utilized in the processing of CT images obtained by CT hardware in Buffalo facility. Vital Images (associated with Toshiba, wrote their use case for AI in Vital Images in 2019) and the Buffalo VA is pursuing an upgrade of our current Vital Images instance.
VA-92	K201103 - Xeleris V Processing And Review Systems	Veterans Health Administration (VHA)	The software uses AI to assist in anomaly detection for patients, in this case used mostly for cancer detection/treatment.

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VA-93	Hologic Genius AI as a part of the Dimensions platform	Veterans Health Administration (VHA)	AI used to assist radiologists' diagnostic performance, improve diagnostic image quality, and deliver workflow improvement tools to enhance patient care.
VA-94	GI Genius™ Intelligent Endoscopy Module	Veterans Health Administration (VHA)	Endoscopic image processing to aide in detection of colorectal polyps utilized by physicians during screening colonoscopy. The endoscopy module was designed to process colonoscopy images that may contain regions consistent with colorectal lesions with a 99.7% sensitivity rate and less than 1% false positives.
VA-95	K213583 - Ingenia MR Systems	Veterans Health Administration (VHA)	The software uses AI to assist in anomaly detection for patients.
VA-96	ClearRead Xray Pneumothorax	Veterans Health Administration (VHA)	The software uses AI to assist in anomaly detection for patients.
VA-97	K170747 - Syngo Application Software	Veterans Health Administration (VHA)	The software uses AI to assist in anomaly detection for patients.
VA-98	IIR 17-095: Improving Outcomes in Veterans with Heart Failure and Chronic Kidney Disease	Veterans Health Administration (VHA)	We plan to fit a deep learning AI model to predict the outcomes of patients with heart failure and chronic kidney disease. Input of the data will be patient characteristics at baseline and treatment initiated (especially RAS Inhibitors). The outcomes will be kidney failure, mortality, and hospitalization. Currently we are working on VINCI, but hope to migrate to PROSPECT. The benefits will be that we will be able to assess risks and benefits on the individual level.
VA-99	Digital Mental Health Tracking App (Behavidence)	Veterans Health Administration (VHA)	This is a mobile mental health tracking app that uses digital phenotyping, which is a moment-by-moment quantification of the individual-level human phenotype in situ using data from personal digital devices, such as smart cell phones. The app will run passively in the background of Veterans' phones monitoring use of various mobile apps, including length of time and frequency of use of the apps. These data-driven insights based on Veteran's digital behavior can help them to understand how they digitally compare to other people with similar conditions such as ADHD, depression, anxiety, and stress.
VA-100	PPO 20-124: Consistency of Uses of ICD Codes for Retrospective Data Analysis	Veterans Health Administration (VHA)	In this project, we used AI techniques to examine the semantic integrity of ICD codes in the VA, especially over the ICD9 to ICD10 transition. Specifically, we used VA ICD code frequencies over 20 years and collected demographic and clinical variables as predictors. The outputs are predicted code frequencies. All analyses were done on the VINCI. The trained Transformer model achieved higher predictive performance than SARIMA.
VA-101	IIR 18-035: Understanding Suicide Risks among LGBT Veterans in VA Care	Veterans Health Administration (VHA)	The goal of this project is to analyze the impact of LGBT status on suicide risk. We conducted a case control analysis. The cases are those with suicide death and the controls are those who are alive but with matching length of history. A special hybrid transfomer model was fitted to the sample data. We proceeded with explanable data analysis finding that the LGBT status is not associated with increased suicide risk, however, certain groups of LGBT patients (e.g. black and older) may be at great risk.

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VA-102	Prediction, expected number of consults and community care, across VHA	Veterans Health Administration (VHA)	Using network analysis, modelled the median time for consults completion and expected number of visits as a function of network topology and population. Built an agent based model to simulate the outpatient referral.
VA-103	Deep Learning for Imaging Report Generating to Support Diagnosis of Military-Relevant Injury in a Deployed or Operational Environment	Veterans Health Administration (VHA)	To develop an AI algorithm for analyzing, classifying, and interpreting VA radiological data, including text and images. The VA will test the developed AI solution to assist radiologists in reading and interpreting radiological data. It is anticipated that this AI solution will improve radiologists' accuracy and/or speed of diagnosing an array of neuromusculoskeletal conditions. Work will be performed on the VA VAEC Cloud solution.
VA-104	Pilot Applications of AI in Radiology	Veterans Health Administration (VHA)	Collect and deidentify medical record in large scale to train a radiology specific language model and use classification generated using NLP to label images as input to neural network to classify images. Utilize neural network to extract diagnosis from medial record to label diagnostic images. Train neural network on the labeled images to make diagnosis, predict outcomes. This work is performed on Desktop in PI office.
VA-105	Artificial Intelligence Radiographic Point-of-Care Decision-Making Aid for Prehospital Fracture and Dislocation in Military and Civilian Populations+E9	Veterans Health Administration (VHA)	The developed AIRFrac models will be evaluated by comparing their performance with state-of-the-art AI models for fracture detection as baselines. AUC with 95% CI will be measured. The difference will be tested. Sensitivity, specificity, and F-score will also be reported. A reader study and noninferiority test will be conducted. The data will be processed on the VA VAEC Cloud solution.
VA-106	First Reader Artificial Intelligence (AI) for Chest CT and Chest Radiograph Examinations	Veterans Health Administration (VHA)	Develop AI tool to enable radiologists to make better and/or faster and earlier diagnoses of diseases identified in chest radiographs and chest CT scans. This is a retrospective studies, radiographs and CT scans with pulmonary pathology will be selected, coded and and used to train AI models. Pulmonary pathology is common in Veteran population, early detection of lung cancer is important to improve survival. This work will be done on a Desktop computer in the PI office,
VA-107	Advanced AI Applications in Radiology	Veterans Health Administration (VHA)	Collect unstructured data from radiology reports and use it to label radiological images at scale to train models to interpret images after processing unstructure text with a in house language model. Medical record information in text and tabular format will be obtained through VISTA or Corporate Data Warehouse. Radiology Imaging Data will be retrieved through PACS or VISTA Imaging. AI models will be created to interpret images and predict outcomes. This is a multisite study with part of the work being performed on the VA cloud and part in PI servers with in the VA.
VA-108	Text-Mining Clinical Interview for Enhancing Clinical Evaluation	Veterans Health Administration (VHA)	Voice recordings from clinical interview are converted through natural langauge processing (dragon speak) to text this text data is then entered in to models for the clustering of patient subsamples and prediction of scales of posttraumatic stress through the use of deep neural networks using R and keras on a VA Desktop. This could enhance the utility of clincal interview.

Use Case ID	Use Case Name	Bureau/Department	Summary of Use Case
VA-109	Diagnostic Machine Learning Algorithm to Identify MEG Features of Mild TBI and Comorbid PTSD	Veterans Health Administration (VHA)	Collection of magnetoencephalography (MEG) will use artificial neural network based to predict classifcation of posttraumatic stress or traumatic brain injury in a sample of veterans.This has the possibility of providing a biomarker for these conditions. Machine learning analysis is performed on a Desktop in the VA non-profit insitute office of the PI.
VA-110	Biomarker Based Classification and Clustering of Veterans With PTSD	Veterans Health Administration (VHA)	This will use genetic polygenic risk scores and MRI data from publically available datasets to predict and cluster the sample based on the diagnosis of posttraumatic stress. If successful this could provide insight into subclustering of Veterans with trauma and a potential biomarker for vulerability for traumatic stress responses. The work will be done on a Desktop in the PI's VA office.
VA-111	Artificial-Intelligence Enhanced Endoscopy	Veterans Health Administration (VHA)	The goal is to use data from real-time polyp histology enabled by computer-assisted diagnosis using Machine Learning/ Artificial Intelligence (ML/AI) to enhance diagnosis for patient collected endoscopy samples. These samples will be converted to digital samples for further analysis. Data will be conducted at the Boston VA.
VA-112	Hotline Categorization for Audits	VA Central Office (VACO)	Use supervised machine learning algorithm to automate assigning VA OIG hotline contacts into categories based on relevance. The algorithm is written in Python and feeds outputs into a SQL server database. By automating the previously manual process, it helps improve efficiency, standardize the categorization processes, and streamline monitoring and reporting of VA OIG hotline contacts.

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VA-113	Stratification Tool for Opioid Risk Mitigation (STORM)	VA Central Office (VACO)	Veterans Health Administration Stratification Tool for Opioid Risk Mitigation (STORM) has demonstrated the ability to target prevention interventions to reduce mortality in patients who are prescribed opioid. To this end, it has been features as an Innovation by the Agency for Healthcare Research and Quality: https://psnet.ahrq.gov/innovation/veterans-health-administration-stratification-tool-opioid-risk-mitigation-storm-shows The STORM decision support system uses data extracted from VHA electronic medical records and predictive analytics to facilitate the identification of patients at high risk of experiencing overdose and suicide events. The STORM decision support system can also review risk factors for patients who are being considered for prescription opioid therapy. STORM prioritizes patients for monitoring and intervention according to their modeled risk and aids clinicians by displaying a patient's risk factors and associated evidence-based risk mitigation interventions. Note that the target population does not include patients with OUD in medication-assisted treatment (MAT). Many patients with OUD and/or in prescription opioid therapy have complex medical and psychosocial needs (e.g., painful conditions, mental health challenges), resulting in interactions with multiple care providers. To address the complexity of a patient's case, STORM aims to provide a holistic intervention that includes multiple care providers and accounts for multiple parts of the patient's history and medical profile.3 Under the STORM-based targeted prevention program, an interdisciplinary team of clinicians, including those with expertise in pain and behavioral health, conduct case reviews for patients identified to be at the highest risk of overdose and/or suicide and implement treatment changes or share recommendations with the patients' providers. The STORM decision support system and targeted prevention program were developed and implemented in the context of relatively high rates of opioid prescribing to veterans and overall rising opioid-involved overdose mortality in the U.S. population. In the last 10 years, overdose deaths have more than doubled in the United States.5 As one response to the problem, the 2016 Comprehensive Addiction and Recovery Act requires the VHA to improve opioid therapy strategies and to ensure responsible prescribing practices. STORM is one of several VHA overdose prevention initiatives that include the distribution of naloxone, efforts to reduce opioid prescribing, and introduction of pain management clinical review and support teams."

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VA-114	REACH-VET (Recovery Engagement and Coordination for Health-Veterans Enhanced Treatments)	VA Central Office (VACO)	Veterans Health Administration RAECH VET model (RV) has demonstrated the ability to target prevention interventions to reduce emergency department visits, inpatient admissions, and documented suicide attempts among patients estimated at high risk of suicide. An internal presentation highlighting the use case, including identification of users, nature of the AI, data inputs and outputs, platform and key benefits can be found here: https://www.hsrd.research.va.gov/for_researchers/cyber_seminars/archives/3527-notes.pdf. A NIMH briefing on the RV model that included results from more recent model evaluation work can be found here: https://www.nimh.nih.gov/news/science-news/2022/study-shows-reach-vet-program-effective-for-veterans-at-high-risk-for-suicide Veteran suicide rates have long exceeded those of other U.S. adults. To address this issue, the Department of Veterans Affairs (VA) created a suicide risk prediction algorithm to identify Veterans Health Administration (VHA) patients with the highest statistical risk for suicide. Research has shown that among at-risk patients identified by the model, those identified in the top 0.1% tier of predicted risk die by suicide at a rate 30 times that of the overall VHA patient population. To help enhance clinical approaches for suicide risk assessment, the VHA rolled out the Recovery Engagement and Coordination for Health–Veterans Enhanced Treatment (REACH VET) program nationally in 2017. The program is the nation's first clinical use of a validated algorithm to help identify suicide risk. The VHA uses the algorithm to identify patients at the highest risk for suicide. This risk information is provided to the patient's local REACH VET program coordinators. The coordinators then inform the patient's clinicians so both can work proactively to enhance the patient's care.
VA-115	Nediser reports QA	Veterans Health Administration (VHA)	Nediser is a continuously trained artificial intelligence "radiology resident" that assists radiologists in confirming the X-ray properties in their radiology reports. Nediser can select normal templates, detect hardware, evaluate patella alignment and leg length and angle discrepancy, measure Cobb angles, and evaluate hip exams for osteoarthritis.
VA-116	Improving Measurement of Palliation with Computer Assisted Abstraction Project	Veterans Health Administration (VHA)	Using a cohort of Veterans with a history of advanced cancer, use computationally assisted methods including AI (machine learning) to characterize circumstances (e.g., denominators) and healthcare processes (e.g., treatments) associated with high quality palliative cancer care. (e.g., better quality of life). Users are identified from the VA Central Cancer Registry, data inputs include textual chart data and structured data (e.g., ICD codes). The platform is Vinci and key benefits will include characterizing gaps and opportunites for improvement of Veteran-family centered advanced cancer care.
VA-117	GI Genius	VA Central Office (VACO)	GI genius is a system that is added to the standard endoscopy video equipment. It is used by anyone doing endoscopy including attending physicians and GI fellows. The equipment uses AI platform to identify areas on the screen/in the colon that may be a polyp. This area is highlighted in a green box for the endoscopist to evaluate and decide if it warrants resection.

Use Case ID	Use Case Name	Bureau/Department	Summary of Use Case
VA-118	Leveraging Novel Sources of Data with Analytic Morphomics to Improve Delivery of Specialty Care to At-Risk Veterans with Liver Disease	Veterans Health Administration (VHA)	The Veterans Health Administration (VHA) is in a unique position to link routinely- collected imaging data to important clinical outcomes. This study will lay the groundwork for the use of this currently underused data source in VHA. The use of morphomic data has the potential to improve patient care for not only CLD, but also a variety of conditions. Findings will inform our partners about the potential clinical impact of risk-based triage for specialty care and lay the groundwork for future efforts to implement such an approach.
VA-119	Using automatic speech recognition (ASR) / speech-to-text (STT) in neurobehavioral testing.	Veterans Health Administration (VHA)	Commercial automated speech recognition / speech-to-text engines are use to produce human transcripts of computerized test battery speech responses in order to aid in scoring the test responses.
VA-120	Algorithms outperform metabolite tests in predicting response of patients with inflammatory bowel disease to thiopurines	Veterans Health Administration (VHA)	This algorithm identifies patients who are prescribed a thiopurine and have full lab results taken within 24 hours. The lab results (platelet counts, mean platelet values, blood urea nitrogen, white blood cell count, hemoglobin, hematocrit, red blood cell count, mean corpuscular volume, mean corpuscular hemoglobin, mean corpuscular hemoglobin per cell, red cell distribution width, percent of neutrophils in WBC count, percent of lymphocytes, percent of monocytes, percent of eosinophils, percent of basophils, sodium, potassium, chloride, C02, calcium, protein, albumin, aspartate transaminase, alkaline phosphatase, total bilirubin, active inflammation despite thiopurines) are input into the algorithm and a score is calculated as to the probability of biologic remission on the thiopurines. The algorithm is used for monitoring thiopurine dosage, adherence, shunting, and effectiveness and has been established for use in pediatric and adult patients with inflammatory bowel disease. It provides percent probabilities for clinical response, nonadherence, and shunting to 6-MMP in IBD patients on thiopurine medications. The VA platform is a dashboard but it has also been deployed at University of Michigan Medicine. This test is beneficial as it outperforms the current metabolite test in predicting remission in inflammation in patients on thiopurines.

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VA-121	Predicting hospitalization and corticosteroid use as a surrogate for IBD flares	Veterans Health Administration (VHA)	This study aims to construct a model that accurately predicts the combined end point of outpatient corticosteroid use and hospitalizations as a surrogate for IBD flare. Methods Predictors evaluated included age, sex, race, use of corticosteroid-sparing immunosuppressive medications (immunomodulators and/or anti-TNF), longitudinal laboratory data, and number of previous IBD-related hospitalizations and outpatient corticosteroid prescriptions. We constructed models using logistic regression and machine learning methods (random forest [RF]) to predict the combined end point of hospitalization and/or corticosteroid use for IBD within 6 months. Results We identified 20,368 Veterans Health Administration patients with the first (index) IBD diagnosis between 2002 and 2009. A novel machine learning model substantially improved our ability to predict IBD-related hospitalization and outpatient steroid use. This model could be used at point of care to distinguish patients at high and low risk for disease flare, allowing individualized therapeutic management.
VA-122	Predicting corticosteroid-free endoscopic remission with vedolizumab in ulcerative colitis	Veterans Health Administration (VHA)	This algorithm is designed for use on patients with UC who are prescribed vedolizumab. The inputs are: Baseline model predictor variables included patient age, gender, race, height, weight, VDZ Interval (VDZ Interval: dosing every 4 or 8 weeks), Immunomodulator use at the start of the trial (ImmAtStart), Steroid use at the start of the trial (SteroidAtStart), previous exposure to anti-TNF therapy (PriorTNF) and all available quantitative laboratory tests at baseline. Longitudinal variables that were calculated included the slope of Faecal Calprotectin (FCP) ((week 6 FCP minus FCP prior to initiation of medication)/6), and the slope of the VDZ drug level ((VDZ drug level at week 6-VDZ drug level at week 2)/4). The primary outcome was corticosteroid-free endoscopic remission at week 52, defined by no use of corticosteroid medications (including prednisone and budesonide) at week 52, and a Mayo Sigmoidoscopy Score of 0 or 1 at week 52. The platform is the statistical software R version 3.3. The benefit of this algorithm is that Vedolizumab is an effective therapy for ulcerative colitis (UC), but costly and slow to work. New clinical responses occur after 30 weeks of therapy and this model will predict efficacy at 1 year.

Use Case ID	Use Case Name	Bureau/Department	Summary of Use Case
VA-123	Use of machine learning to predict surgery in crohn's disease	Veterans Health Administration (VHA)	Although imaging, endoscopy, and inflammatory biomarkers are associated with future Crohn disease (CD) outcomes, common laboratory studies may also provide prognostic opportunities. We evaluated machine learning models incorporating routinely collected laboratory studies to predict surgical outcomes in U.S. Veterans with CD. Adults with CD from a Veterans Health Administration, Veterans Integrated Service Networks (VISN) 10 cohort examined between 2001 and 2015 were used for analysis. Patient demographics, medication use, and longitudinal laboratory values were used to model future surgical outcomes within 1 year. Specifically, data at the time of prediction combined with historical laboratory data characteristics, described as slope, distribution statistics, fluctuation, and linear trend of laboratory values, were considered and principal component analysis transformations were performed to reduce the dimensionality. Results: We included 4950 observations from 2809 unique patients, among whom 256 had surgery, for modeling. Our optimized model achieved a mean area under the receiver operating characteristic of 0.78 (SD, 0.002). Anti-tumor necrosis factor use was associated with a lower probability of surgery within 1 year and was the most influential predictor in the model, and corticosteroid use was associated with a higher probability of surgery. Among the laboratory variables, high platelet counts, high mean cell hemoglobin concentrations, low albumin levels, and low blood urea nitrogen values were identified as having an elevated influence and association with future surgery.
VA-124	Machine learning models to predict disease progression among veterans with hepatitis C virus	Veterans Health Administration (VHA)	Clinical risk prediction models in chronic hepatitis C virus (CHC) can be challenging due to non-linear nature of disease progression. We developed and compared two ML algorithms to predict cirrhosis development in a large CHC-infected cohort using longitudinal data. We used national Veterans Health Administration (VHA) data to identify CHC patients in care between 2000–2016. The primary outcome was cirrhosis development ascertained by two consecutive aspartate aminotransferase (AST)-to-platelet ratio indexes (APRIs) > 2 after time zero given the infrequency of liver biopsy in clinical practice and that APRI is a validated non-invasive biomarker of fibrosis in CHC. We excluded those with initial APRI > 2 or pre-existing diagnosis of cirrhosis, hepatocellular carcinoma or hepatic decompensation. Enrollment was defined as the date of the first APRI. Time zero was defined as 2 years after enrollment. Cross-sectional (CS) models used predictors at or closest before time zero as a comparison. Longitudinal models used CS predictors plus longitudinal summary variables (maximum, minimum, maximum of slope, minimum of slope and total variation) between enrollment and time zero. Covariates included demographics, labs, and body mass index. Model performance was evaluated using concordance and area under the receiver operating curve (AuROC). A total of 72,683 individuals with CHC were analyzed. Boosted-survival-tree based models using longitudinal information are statistically superior to cross-sectional or linear models for predicting development of cirrhosis in CHC, though all four models were highly accurate. Similar statistical methods could be applied to predict outcomes in other non-linear chronic disease states. Analyses were conducted in R.

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VA-125	Machine learning models to predict disease progression among veterans with hepatitis C virus	Veterans Health Administration (VHA)	Evaluation of new treatment policies is often costly and challenging in complex conditions, such as hepatitis C virus (HCV) treatment, or in limited-resource settings. We sought to identify hypothetical policies for HCV treatment that could best balance the prevention of cirrhosis while preserving resources (financial or otherwise). Methods: The cohort consisted of 3792 HCV-infected patients without a history of cirrhosis or hepatocellular carcinoma at baseline from the national Veterans Health Administration from 2015 to 2019. To estimate the efficacy of hypothetical treatment policies, we utilized historical data and reinforcement learning to allow for greater flexibility when constructing new HCV treatment strategies. We tested and compared four new treatment policies: a simple stepwise policy based on Aspartate Aminotransferase to Platelet Ratio Index (APRI), a logistic regression based on APRI, a logistic regression on multiple longitudinal and demographic indicators that were prespecified for clinical significance, and a treatment policy based on a risk model developed for HCV infection.
VA-126	Assessment of a Deep Learning Model to Predict Hepatocellular Carcinoma in Patients With Hepatitis C Cirrhosis	Veterans Health Administration (VHA)	This prognostic study included 48 151 patients with hepatitis C virus (HCV)–related cirrhosis in the national Veterans Health Administration who had at least 3 years of follow-up after the diagnosis of cirrhosis. Deep learning RNN models outperformed conventional linear regression models and could be used to identify patients with HCV-related cirrhosis at high risk of developing HCC. We used 2 types of predictor variables for HCC prediction, as follows: (1) 4 baseline predictors, which do not change over time, ie, age at cirrhosis diagnosis, sex, race, and HCV genotype; and (2) 27 longitudinal predictors, which may change over time and are available at multiple times during follow-up, including development of cirrhosis, achievement of sustained virologic response (SVR), body mass index (calculated as weight in kilograms divided by height in meters squared), and 24 laboratory blood tests (bilirubin, AST, AST–upper limit of normal (ULN) ratio, ALT, ALT:ULN ratio, α-fetoprotein, α-fetoprotein–ULN ratio, alkaline phosphatase, alkaline phosphatase–ULN ratio, albumin, AST:ALT ratio, fibrosis-4 (FIB-4) score,30 AST-platelet ratio index (APRI), blood urea nitrogen, creatinine, glucose, international normalized ratio, hemoglobin, white blood cell count, platelet count, sodium, potassium, chloride, and total protein). We performed LR models without lasso penalty using the Scikit-learn library40 in Python version 3.45.7 and LR models with lasso penalty by the glmnet R version 3.6.1 package41 (R Project for Statistical Computing). The numerical implementation of the RNN model was in PyTorch version 1.1.42 Meaning: The findings of this study suggest that RNN models could have multiple applications in clinical practice and could be applied to HCC outreach and surveillance strategies Exposures Development of HCC. Main Outcomes and Measures : Area under the receiver operating characteristic curve, area under the precision-recall curve, and Brier score.

Use Case ID	Use Case Name	Bureau/Department	Summary of Use Case
VA-127	Using Machine Learning to Predict and Prevent Opiod Use Disorder and Overdose	Veterans Health Administration (VHA)	The current study seeks to improve the ability of the VHA to screen and identify Veterans at high risk for incident and recurrent OUD and overdose over proximal and distal intervals using machine learning prediction models. It is clinically crucial to identify novel predictor profiles for OUDs and overdose that will improve the identification of high-risk subgroups and facilitate targeted prevention and intervention efforts. The overall aim of this study is to use machine learning prediction models to evaluate the multifaceted, additive and multiplicative interactions of known and novel risk factors for opioid use disorder (OUD) and overdose in Post-9/11 Veterans. The study will also investigate the short- and long-term impact of the coronavirus disease 2019 (COVID-19) pandemic on the risk of OUD and overdose. The study will use Veterans Health Administration (VHA) electronic medical records to develop models predicting OUD and overdose risk. The sample will include Post-9/11 Veterans who are aged 18-65, receive care in the VHA, and will have completed the VA primary TBI screen between October 2007 and February 2020 (n~1.3 million). We will use several machine learning classification-tree modeling approaches, including classification and regression trees, random forest, and gradient boosting, to develop predictor profiles of OUD and overdose incorporating important risk factors and interactions. The validity (sensitivity and specificity) and prediction accuracy (area under the curve) will be assessed for all prediction profile models.
VA-128	Utilizing NLP to Identify and Support Veterans with Long COVID and the applicaton within the VA health system	Veterans Health Administration (VHA)	Long COVID is a condition with an evolving clinical definition and consistent coding among clinicians presents a challenge to tracking this patient population for any health system (including the VA) as well as to recruit for research purposes. Many patients continue to struggle with heterogeneous symptoms impacting morbidity and in cases mortality. Research activities continue to accelerate understanding while identifying therapeutic pathways. The VA team is working to apply NLP approaches to 1) size the impacted population as this will inform operational needs across the health system 2) identify if there may be unique phenotypes of impacted populations 3) contribute to ongoing research activities 4) test if there is a predictor for risk for long COVID among impacted populations. The benefit may benefit clinicians in the field, researchers as well as leadership to inform operational resources and policies. To support clinicians to identify Veterans' status with Long COVID. The effort will employ NLP as well as other types of classifiers. Inputs are the clinical notes (TIU notes) as well as demographic and health data of patients including health factors based on current medical record. Outputs may be a score or a series of scores of the probability of long COVID or other experiences. This will empower clinicians to deliver care with an ambiguious and evolving clinical definition.