



## Health Services Research and Development Updated Research Priorities

### Background

The VA Office of Research and Development (ORD) Health Services Research and Development (HSR&D) program announces **updated research priorities** effective October 2018 for its investigator-initiated Parent RFA and similar funding mechanisms. HSR&D's mission is to advance knowledge and promote innovations in quality, effectiveness, efficiency, cost and accessibility of health services to improve the health and care of Veterans and the nation.

The updated priority areas are in response to the changing VA health care system and the changing needs of Veterans. They also reflect current trends that are disrupting health care in general and VA care in particular: 1) rapid growth of new technologies (e.g., virtual care, mobile health) enabling care delivery outside the clinic walls, 2) increased desire from patients and families to be involved in health care decisions, especially with an aging population, 3) increased attention to the social determinants of health, 4) greater demand from health care leaders to show how clinical research leads to more rapid quality improvement, and 5) changing laws and policies regulating health care, and the challenge of making these policies work at the provider and clinic levels (See Figure).

As in other U.S. health care systems, VA is also evolving towards achieving the principles of a **Learning Health Care System**, in which the National Academy of Medicine has defined as the process by which "clinical informatics, incentives, and culture are aligned to promote continuous improvement and innovation, with best practices seamlessly embedded in the delivery process and new knowledge captured as an integral by-product of the delivery experience." In concert with its strive towards a Learning Health Care System, VA is also focused on becoming a **High-reliability Health Care System**, particularly in response to recent reports by the Government Accountability Office and the VHA Commission on Care to ensure VA care is provided optimally and consistently across different settings. High-reliability Health Care Systems focus on empowering frontline providers to lead performance improvement, where health care leaders encourage a culture that has a focus on operations through preoccupation with failure, reluctance to simplify, deference to expertise, and commitment to resilience (Weick & Sutcliffe, 2015).

### Updated HSR&D Research Priorities (Refer to HX-19-001 for funding application details)

The following sections outline the research priorities for HSR&D program applications. Overall, HSR&D strongly encourages research that demonstrate novel concepts, applies innovative methods that have a strong potential to impact VA health services, and involves inclusion of Veterans and other key stakeholders in the development and execution of the science.

**Priority areas for HSR&D fall into three broad categories: A) Priority areas identified by VHA/ORD based on needs of Veteran and their common conditions B) health services priorities related to current policy or key legislation, and C) priorities for advancing health services research methods in areas that cut across conditions or care settings).** HSR&D highly encourages research that addresses at least one of the priority areas below, and also addresses more than one where appropriate (for example, a study using new health services research methods to examine a clinical priority area or to evaluate the impact of legislation).

## A. VHA/VA Veteran Care Priorities

HSR&D especially encourages research that addresses novel health services methods focused on conditions or priority areas affecting Veteran care as outlined in the table below. Particular attention will be paid to research that is also responsive to the following VHA and ORD priority conditions that affect Veterans: suicide prevention, Gulf War Illness, Post-Traumatic Stress Disorder (PTSD), and traumatic brain injury (TBI).

<b>Suicide prevention</b> , especially for Veterans transitioning from military service	<b>Opioid use disorder</b> and <b>pain</b> treatment, including use of complementary & integrative health for pain
<b>Access to Care</b> , including Rural Health and Community (non-VA) Care	<b>Long-term care, aging,</b> and Caregiver support, including home and community-based services
<b>Mental health</b> , including Post-Traumatic Stress disorder ( <b>PTSD</b> )	<b>Health care informatics</b> , including use of big data, artificial intelligence, provider decision support, measurement science, and information science
<b>Women's health</b> , including gender sensitive and other conditions and services of high need affecting women veterans	<b>Health Equity</b> , including interventions for minority, underserved or special populations with unique health care needs, social determinants of health, and disease prevention/health promotion.
<b>Health care value</b> , including reducing over-use, business case analysis, return-on investment, and policy analysis	<b>Quality and safety of health care</b> including quality measurement, patient safety, and medication management
<b>Primary care practice and management of complex chronic diseases</b>	<b>Population Health and Whole Health</b> , including complementary and integrative health and Veteran-centered care across the spectrum of conditions
<b>Disability</b> including spinal cord injury ( <b>SCI</b> ) and traumatic brain injury ( <b>TBI</b> )	<b>Virtual care</b> including <b>telehealth</b> and mobile health and impacts on access, quality of care, and patient and provider experience.

### Suicide Prevention

HSR&D encourages effectiveness, implementation, or population-based and community-level studies that focus on improving and implementing evidence-based practices that will prevent suicide within the Veteran population. These may include population-based, individual-based, and system level studies that improve identification and engagement of Veterans at risk, examine and improve the delivery of suicide prevention interventions and strategies, while drawing from the perspectives of patients, caregivers, providers, and managers as well as from the relevant datasets now available for this purpose. Studies on Veterans in the first year following discharge from the military and transitioning into civilian life will be given highest priority.

### Gulf War Illness

By mid-2013, Gulf War Veterans accounted for more than 2 million outpatient visits and more than 20,000 in-patient admissions. Although an increase in multi-symptom illnesses has been documented for Gulf War Veterans, relatively little is known what kind of care Gulf War Veterans have been receiving from the VA and from outside the VA for multi-symptom illnesses and for other diagnosed and unusual health conditions they have. The VA is especially interested in studies that can provide comparisons of care patterns in Gulf War Veterans relative to other Veterans with comparable conditions or needs, and the impact of such care on Veteran outcomes and care experience

### PTSD

PTSD is one of the most common psychiatric sequelae of war, and rates among military Veterans returning from deployments in Iraq and Afghanistan are much higher (20%) than that found in the general population. Currently, about 400,000 Veterans enrolled in VA carry a PTSD diagnosis. Those who suffer from PTSD often have diminished functioning and a poorer quality of life as evidenced by

elevated rates of suicide, hospital admissions, poverty, and unemployment. Although there are PTSD treatments available that have demonstrated effectiveness among individuals with diagnosed PTSD, many people who have PTSD may not be diagnosed and many who are diagnosed do not pursue mental health treatment. Of those who do seek treatment, prolonged delays are common. Areas of interest for PTSD health services research include:

- Interventions to increase the engagement and retention of Veterans in evidence-based therapies.
- Studies of optimal care for PTSD outside of mental health settings, especially in primary care as well as care in underserved areas
- Use of virtual care or e-health technologies to enhance access to evidence-based psychotherapies
- Effective interventions focused on recovery from military sexual trauma
- Optimal combinations of psychosocial and pharmacologic treatments for PTSD, including treatment response across different Veteran populations, including the use of sequential multiple assignment randomized trials (SMART) or similar adaptive designs
- Incorporation of patient preferences and caregiver support for Veterans living with PTSD

## **TBI**

TBI accounts for a significant portion of combat casualties from the ongoing conflicts in Afghanistan and Iraq. Concussive or mild TBI (mTBI) is the most common form of combat-related injury, which can occur even in those not directly hit by a blast, without obvious external injuries, and without loss of consciousness. Problems with memory, lack of concentration, increased anxiety and irritability are common hallmarks of mTBI. In addition to mTBI, service men and women close to blasts experience severe injuries. Those with moderate to severe TBI can have persistent difficulties in executive function, sensory difficulties, and emotional disturbances, resulting in permanent difficulties with memory, reasoning, emotion, and expression making it difficult to hold steady employment or regain pre-injury quality of life. Research on the etiology and rehabilitation of more severe cases of TBI are the domain of the Rehabilitation Research and Development service, but areas of interest to HSRD include:

- Issues related to needs and barriers assessment of mild, moderate, and severe TBI, such as VA and non-VA services use, application of e-health and other mobile health technologies to facilitate access to and continuity of care, and Veteran/caregiver/family engagement in care
- Development, examination, and comparison of models of service delivery and care management that promote optimal recovery, rehabilitation, and reintegration for different severity levels of TBI
- Sustainability and cost effectiveness of clinical and rehabilitation interventions, including implementation strategies to promote uptake of these interventions, for TBI and its sequelae

## **B. VA-related Legislation Priorities**

**HSR&D highly encourages research that is focused on major national legislative initiatives affecting Veteran care: notably the MISSION Act and CARA.**

### **MISSION Act, including Community Care, Access to Care, & Caregiver/Non-Institutional care.**

HSR&D strongly encourages research that addresses key provisions of the *VA Maintaining Systems & Strengthening Integrated Outside Networks (MISSION Act)*, notably with a focus on community care program implementation, including the coordination of VA and non-VA care, virtual care (e.g., telemedicine), use of value-based payment models, enhancing access to and quality of care in VA medical service lines, and improving access to and quality of care in medically underserved areas. With the implementation of the MISSION Act, Veterans are being given more options for where to

receive care, and more care is being delivered in the community outside the VA Healthcare System. As VA continues to evolve towards being a payer of as well as a provider of care, contracting with networks of providers, health services researchers have opportunities to address several critical questions:

- Validation and utility of access and continuity of care measures, including assessments of patient satisfaction and care experience
- New models of care coordination across VA and community settings and impact on access to and quality of care for Veterans
- Optimal approaches to implement virtual care to improve access to and quality of Veteran care
- Evaluation of different payment models to enhance quality outcomes and cost-effectiveness of community care
- Valid methods for monitoring quality and safety of non-VA care to ensure that Veteran care is consistent across different settings, especially in underserved (e.g., rural) settings
- Impact of non-VA care on access, cost-effectiveness, outcomes, and value of the care received by Veterans, including care that is continuing to be provided by VA providers
- Optimizing health information exchanges and/or external partnerships with major health plans, payers, and other entities, e.g., the DoD, Medicaid and Medicare providers (CMS) to improve and sustain quality care for Veterans
- **Access to care**, including novel research to enhance access to care for Veterans in VA as well as non-VA settings, e.g.,
  - Novel interventions or implementation strategies to improve VA group practice management to reduce wait times and improve productivity
  - Implementation strategies to improve productivity, clinic workflows, and organization and satisfaction of care
  - Use of virtual care, provider task-shifting, and other strategies to improve access to care as well as patient satisfaction and experience with care
  - Culturally sensitive interventions to reduce disparities in access to or quality of care for underserved Veteran populations, including rural populations
  - Methods for comparing VA and non-VA care within specific markets, including assessments of access, safety, quality and satisfaction.
- **Caregiver, long-term care, and non-institutional care for Veterans** is emphasized given the expansion of eligibility for the comprehensive family assistance to Caregivers under the MISSION Act. The aging Veteran population, as well as the rising costs of nursing home care has increased the demand for home-based care (Ramchand, Tanielian, et al., 2014). Areas of research interest include:
  - New models of non-institutional care that benefit Veterans and their Caregivers/family/survivors, and assess the effectiveness of these programs or services provided to these populations, especially for underserved (e.g., rural) populations.
  - Identification and rapid testing of novel approaches for supporting Veterans at home, including strategies that incorporate novel technologies and input from Veterans and their Caregivers
  - Development and validation of measures that assess changes in Veteran and Caregiver needs over time, especially measures that can match change to particular types of services
  - Development of critical data systems and deployment and evaluation of strategies for providers and Caregivers to enhance effective practices and inform national programs/policies
  - Implementation strategies that can further sustain effective non-institutional and Caregiver models across different subpopulations

For more information on the MISSION Act, visit:

[https://vaww.vashare.vha.va.gov/sites/LIT/MISSION\\_Act/SitePages/Homepage.aspx](https://vaww.vashare.vha.va.gov/sites/LIT/MISSION_Act/SitePages/Homepage.aspx)

**Comprehensive Addiction and Recovery Act:** Passed in 2016, the [Comprehensive Addiction and Recovery Act \(CARA\)](#) emphasizes research on prevention and treatment for opioid use disorder and pain, including the feasibility, safety, long-term efficacy, and implementation of these programs.

Areas of particular interest include:

- VA and non-VA care coordination for pain management, including innovative strategies to enhance uptake of prescription monitoring (Prescription Drug Monitoring Program, also in the MISSION Act) and guideline-based pain care in the community, particularly for tracking opioid and polypharmacy prescribing among VA and non-VA providers
- Incorporating patient preferences in increasing access to non-opioid pain management effective practices
- Testing and/or implementing theory-driven patient-centered interventions that apply collaborative care models and health behavioral change techniques for chronic pain/opioid use.
- Dissemination and implementation of complementary and integrative health best practices shown to help with pain management
- Innovative implementation strategies to promote fidelity and improved outcomes for pain/opioid misuse stepped care, collaborative care, and/or psychosocial treatment models.
- De-implementation of problematic prescribing practices by PCPs and within VA facilities.
- Comparisons of alternative strategies for medication-assisted treatment (MAT), including novel ways to expand access to MAT.
- Treatment of long-term opioid users, including tapering regimens, detection and management of underlying opioid use disorders (OUD), management of co-existing pain and OUD. Assessing the efficacy, the acceptance and use of the VA/DoD clinical practice guidelines (CPGs) for treating pain in PC
- Studying safety and efficacy issues related to long-term opioid therapy among aging Veterans and Veterans with mental health (non-pain) conditions, including issues related to polypharmacy (e.g., benzodiazepines and opioids, SSRIs/SNRIs and opioids, etc.)
- Improving access through innovative virtual technologies including implementation of telehealth and other virtual services for pain/opioid management for Veterans, especially in rural areas.
- Studies of treating pain among Veterans with co-existing conditions and other vulnerabilities.
- Veteran-centered (“Whole Health”) approaches to mitigating prescription drug misuse and reducing risk factors associated with drug misuse

### **C. Research Methods addressing VA Learning Health Care System priorities:**

**HSR&D highly encourages research that focuses on emerging health system science methods related to implementation science, complexity science/health systems engineering, or data science.** Health services research involves multidisciplinary activities incorporating expertise from a variety of scientific and clinical disciplines. The use of multidisciplinary methods should also be aligned with the VA’s evolution towards a Learning Health Care System (National Academy of Medicine, 2012) and High-reliability Health Care System (Weick and Sutcliffe, 2015). HSR&D strives to inform VA’s evolution towards a High-reliability, Learning Health Care System by incorporating multidisciplinary research methods that take advantage of innovative programs being initiated by VA clinical partners as well as those developed in research. We encourage use of a broad variety of designs, including cluster randomized, stepped-wedge, and similar pragmatic designs, survey research, mixed-methods/qualitative analysis, data analytics, psychometrics, econometrics, and social science. Specifically, HSR&D highly encourages research that includes novel research

methods within the following areas: implementation science, complexity science/health systems engineering, and/or data science (see below). These methods priority areas were also chosen because they align with VA's Office of Research and Development (ORD) **overall priority goals of 1) increasing Veterans' access to high-quality clinical trials, 2) increasing the substantial real-world impact of research, and 3) transforming VA data into a national resource.**

### **Implementation science**

Implementation science is the scientific study of the use of strategies to promote the uptake of effective interventions or treatments in clinical and community settings in order to improve Veteran health. The need for implementation science came from the realization that effective interventions are often developed within single sites and rarely get translated elsewhere due to organizational barriers and/or lack of provider time or resources, thus resulting in lost opportunities for spread and sustainability. Moreover, barriers to implementation are be attributed to a lack of capacity in designing interventions to be implemented in routine practice (see Brownson et al 2013, Proctor et al. 2011), lack of efficiency in use of existing staffing or resources, and/or lack of deep understanding of the interactions across providers and between patients and providers.

HSR&D is especially interested in the development and testing of different implementation strategies based on hybrid effectiveness-implementation designs (see Table below). Implementation strategies are highly-specified, theory-based methods used to improve uptake of effective practices, or in some cases, de-implement ineffective or low-value treatments. A variety of implementation strategies exist ([Powell, et al. 2015](#)) that range from performance-focused strategies (i.e., "push") such as audit and feedback and performance incentives, to motivation-focused strategies (i.e., "pull") such as Evidence-based Quality Improvement, Facilitation, and Community Engagement ([Atkins et al. 2017](#)). Yet few have been empirically tested that demonstrate uptake and real-uptake of effective practices in routine care. Particular consideration will be given to hybrid designs involving development and testing of innovative implementation strategies that help close the gap between research and practice, particularly for underserved health care settings (e.g., limited exposure to research studies or lower published quality of care), to ultimately **increase the substantial real-world impact of research (ORD goal #2).**

Innovative use of pragmatic trial designs, hybrid effectiveness-implementation designs, stepped-wedge or similar designs, as well as adaptive or sequential multiple assignment randomized trial (SMART) designs is also highly encouraged. Studies involving the testing of implementation strategies should also specify how **fidelity to the effective practice is measured, as well as how the cost of implementation will be estimated.** For more information visit the VA Quality Enhancement Research Initiative ([QUERI](#)) program and QUERI Center for Evaluation and Implementation Resources ([CEIR](#)).

Examples of implementation -focused studies include the following:

- Testing of novel implementation strategies (e.g., Type III hybrid effectiveness-implementation designs) that improve provider engagement and reduce burnout, especially those that involve provider leadership development, and/or organizational or information technology changes that improve access, efficiency, quality, and outcomes of care.
- Implementation strategies that involve incorporation of Veteran and frontline provider input (e.g., user-centered-design, community-based participatory research)
- Comparative effectiveness of different implementation strategies that encourage engagement of frontline provider and clinical managers, notably through leadership skills development, systems engineering or operations research-derived processes, or other incentives and policies

- Studies focused on de-implementation of established practices and ways in which it differs from adoption of new practices.
- Identification of effective implementation strategies using Type II hybrid effectiveness-implementation study designs to enhance clinician uptake of new or emergent clinical practices or innovative technologies such as genomic medicine (precision medicine), e-health/mobile health, etc. in routine practice, especially those that facilitate use of the clinical intervention by existing providers.
- Studies (e.g., Hybrid Type I designs) that assess intended or unintended consequences of new programs, policies, or quality improvement initiatives on provider engagement or burnout, especially studies focused on interventions that seek to increase employee engagement.
- The impact of different methods of presenting information (e.g., from EHRs, decision support systems, other informatics tools) on provider decisions.

### Hybrid Effectiveness-Implementation Design Types (Curran et al, 2012)

	Type I	Type II	Type III
Design Characteristic	Test clinical intervention, observe/gather information on implementation	Test clinical intervention & implementation strategies	Test implementation strategy, observe/gather information on clinical intervention outcomes
Question	Is treatment effective versus usual care (UC)?	Is treatment delivered through implementation strategy* at provider or health system effective vs UC?	Does implementation strategy A vs. implementation strategy B improve treatment uptake?
Unit of analyses	Patient	Providers/clinics	Providers/clinics
Who pays for interventionists	Study budget	Study or health system (VA existing providers)	Health system (VA existing providers deliver intervention)
Primary outcomes	Health outcomes	Process measures, fidelity	Provider Uptake, Sustainability, fidelity
Key Advantage	“Cleanest” in determining intervention effectiveness	Ideal when there is time-sensitive need to roll out intervention	All participants get intervention, focus on what strategies will help sustain practice

### Complexity Science and Health Systems Engineering

There is increasing realization that to deepen our understanding of healthcare, researchers, implementation scientists, and policymakers need to examine phenomena at multiple levels to address the emergence of collective behaviors that arise from individual elements or parts of a system working together. Emergence can also describe characteristics of the functioning of a system within the context of its environment. Often properties we associate with a system itself are instead actually properties of the relationships and interactions between a system and its environment. By viewing healthcare as a complex adaptive system\* and applying the concepts and methods from complexity science, we can best explore the often complex and dynamic relationships among parts of



the healthcare system and between the system and its environment to understand the system as a whole and achieve important quality performance goals.

These goals – which include safety, effectiveness, timeliness, patient-centeredness, efficiency, and equity – demonstrate the important parallels between the disciplines of health systems engineering (HSE), health services research, and implementation science research. Understanding healthcare delivery as a complex adaptive system helps us redesign or improve the system so that it is more efficient, effective, and equitable and yields better health outcomes. Multilevel simulation modeling derived from complexity theory is a powerful and effective quantitative tool to evaluate alternate ways of organizing healthcare delivery to achieve these goals.

There has been a growing interest in applying approaches and tools from HSE to solve many healthcare problems in the VA; and this focus area is aligned **with ORD Goal #2 to increase the substantial real-world impact of research**. This goal speaks to the need to improve the access, efficiency, and delivery of quality health services to Veterans, especially to inform optimization of health care services in post-deployment care, community care, care transitions, and other situations that cross health system/community boundaries. VA national programs, notably the Veterans Engineering Resource Center (VERC), National Center on Patient Safety, and Product Effectiveness offices apply HSE concepts to day-to-day VA practice. Further research is needed to apply existing and develop and test new conceptual frameworks and methods from complexity science and modeling and simulation approaches from HSE to the VA health care setting, with the hope to generalize successful models and approaches to the non-VA (general) healthcare system.

\*Characteristics of a complex system include:

- Heterogeneous agents/diversity
- Nonlinear dynamics
- Contact structure; networks; organization
- Feedback, adaptation, learning, evolution
- Stochastic with concern for “tails”

### *Health Systems Engineering*

Health systems engineering/engineering systems (HSE) views healthcare as a complex adaptive system and applies the principles and methods of complexity science to achieve its goals. HSE requires a variety of quantitative and qualitative tools for analyzing and interpreting system models. These tools come from fields such as psychology, computer science, operations research, management, economics, and mathematics. Quantitative tools include optimization methods, control theory, stochastic modeling and simulation, statistics, utility theory, decision analysis, and econometrics. Mathematical techniques have the capability of solving large-scale, complex problems optimally using computerized algorithms such as those derived from data science techniques (including machine and deep learning). Engineering systems more explicitly examines the role and influence of system architecture of complex engineering systems as well as sociotechnical complexity (another important system lifecycle property).

Examples of relevant research projects under this methodological focus area include but are not limited to the development, testing, application and evaluation of holistic (i.e. complex systems science approaches) computational (including machine and deep learning algorithms, artificial intelligence, and other data science approaches), mathematical, or engineering (HSE) models to:

- improve access, increase effective and efficient healthcare delivery, and optimize healthcare services across VA and non-VA care, post-deployment, transitions in care, and other situations that cross health system/community boundaries.



- maximize effective primary and specialty care appointment utilization via specialty consults, secure messaging, etc. including validation of these models across different organizational and clinical contexts (e.g., later adopter, lower-resourced sites).
- design and test deployment strategies for e-health technologies to improve patient-provider interactions beyond the clinic walls.
- address the impact of variation in business practices and external capacity on the health care supply chain.
- understand the impact of organizational change, provider behavior, patient predictive behavior and patient experience on optimal strategies to coordinate care between primary care providers and specialists.
- improve the quality and cost-effectiveness of healthcare.
- improve the administrative, logistical, and operational conduct of healthcare delivery for Veterans, especially across different organizational contexts to standardize/improve supply chain management strategies and optimize healthcare delivery (e.g., appointment scheduling).
- examine the impact of system architecture on healthcare system performance and application of this understanding to system redesign and improvement.

Given the holistic nature of these topic areas, this RFA focus-area also seeks to promote transdisciplinary collaboration among healthcare researchers and experts in complexity theory and computational (machine learning, AI, data science), mathematics, and engineering approaches from HSE to further the development, testing, and evaluation of modeling- and simulation-based systems science methodologies and their application to important public health and healthcare challenges.

### **Data and Measurement Science**

A particular advantage of VA research is the robust set of clinical data that are available to researchers through over two decades of electronic health record data. Numerous data sets are incorporated into the VA Corporate Data Warehouse, and into the research repository on VINCI. Other important sources of data exist outside of VHA, including data from VBA, Medicare claims, geographic information systems, census data, wearable devices, social media, among others. HSRD research is interested in proposals that apply novel methods to VA data or use novel data sources for new insights. Potential types of research studies under this methods area include the use of machine learning, natural language processing, and artificial intelligence to more accurately diagnosis health conditions, predict clinical and population health outcomes, especially using data sources beyond administrative data, including electronic medical record, mobile health, e-health/web-based data, wearable devices, genomics data, and population health determinants data. We encourage studies that also involve innovative methods to capture patient and provider experience (e.g., burnout) and patient-reported outcomes, as well as data on quality of care from non-VA settings are highly encouraged. This area of emphasis is also aligned with **ORD goal #3, transforming VA data into a national resource**

VHA is undergoing a transition in electronic health records not seen in decades. As in settings outside the VA, adoption of new electronic medical record formats has substantial impact on clinician workflows and information sharing, and will also bring forth the potential to use novel tools to enhance patient care coordination, quality, and safety. HSR&D has conducted research to inform use of innovative strategies in [informatics](#) that can improve care coordination, primarily at the patient encounter, as well as quality and safety of care within the VA system. Largely missing from the VA research portfolio, however, has been a more cumulative system-level examination of the effects of electronic health and data analytics interventions on Veteran-level quality and timeliness of care, as well as on provider work load, efficiency, and turnover. Innovative research in the area of

measurement science and data analytics should also support **ORD's priority of transforming VA data into a national resource.**

Research topics under this methods priority include but are not limited to:

- Application of big data methods and computational science (including natural language processing-NLP and machine learning) to health care delivery and outcomes improvement.
- Analysis of health information exchange data (VA, non-VA clinical and utilization data) to promote efficiency and effectiveness of care coordination
- Innovative uses of information technology to improve diagnosis, clinical decisions, and adverse event monitoring; reduce medical errors; improve patient safety; reduce low-value care; and increase health care quality and value.
- Innovative methods to verify the validity of underlying data from combined multiple sources including administrative, clinical encounter, medical record, mobile health, e-health/web-based data, notably to detect inappropriate data, inconsistencies across data from different sources, and evidence of bias.
- Innovative methods in implementing measurement-based care on patient outcomes and experience, to capture and verify data used to measure outcomes, access, quality, and care experience, especially from patient-reported or patient-generated data sources (e.g., My HealthVet, e-health, mobile health applications, wearable devices)
- Novel application and standardization methods for emerging data information models (e.g., SNOMED, LOINC, OMOP) in the new VA electronic health record format especially for measuring quality, access, and care experience for Veterans, especially for vulnerable populations.
- Innovative methods incorporating use of new data sources beyond electronic medical record data in measuring patient-centered and population health outcomes, including existing research registries, genomic and pharmacogenomics data, new VA clinical data systems; financial information; geographic information; public data sources, social media, etc. to improve individual and population health metrics. Such studies should include attention to the costs and marginal value of new data linkages, to inform VA about priorities to create new data sources, link to new existing sources, and invest in efforts to improve quality of existing data.
- Application of big data methods and computational science (including natural language processing-NLP and machine learning) to health care delivery and outcomes improvement.
- Studies to assess and improve the use of patient reported data and different means for collecting patient-reported data related to the content of care, the experience of care, patient behaviors and important health outcomes. Areas of interest include investigation of the effects of different sources of patient-reported data (e.g., mobile health apps involving ecologic momentary assessment/sensing methods, in-visit assessment, MyHealthVet, social media) on the completeness, reliability, and validity for collecting different data elements. Also of interest are comparisons to alternative means for collecting important data beyond patient self-assessment (e.g. activity monitors or smartphone use vs. self-report of physical activity).
- Innovative methods for more accurately capturing the content of a patient visit to ensure accuracy of recorded visit documentation and to more completely capture essential components of the visit (e.g., delivery of counseling, advice about medications) to improve quality measurement.
- Innovative approaches to improving the ability to assess the value and efficiency of care provided by VA and for informing decisions about alternative models for providing necessary care.

#### D. Key References:

1. Atkins D. Are We Growing the Right Health Services Research Workforce of the Future? Thoughts from a National Delivery System. *Health Serv Res.* 2018 Oct;53 Suppl 2:4034-4040. doi: 10.1111/1475-6773.13032
2. Atkins D, Kilbourne AM, Shulkin D. Moving from Discovery to System-Wide Change: The Role of Research in a Learning Health Care System- Experience from Three Decades of Health Systems Research in the Veterans Health Administration. *Annual Review of Public Health* 2017; 38: 467-487. Available at: <http://www.annualreviews.org/doi/pdf/10.1146/annurev-publhealth-031816-044255>
3. Brownson RC, Jacobs JA, Tabak RG, Hoehner CM, Stamatakis KA. Designing for dissemination among public health researchers: findings from a national survey in the United States. *Am J Public Health.* 2013 Sep;103(9):1693-9. doi: 10.2105/AJPH.2012.301165.
4. Ganguli I, Wasfy JH, Ferris TG. What Is the Right Number of Clinic Appointments? Visit Frequency and the Accountable Care Organization. *JAMA* April 6 doi:10.1001/jama.2015.3356
5. Kilbourne AM, Elwy AR, Sales AE, Atkins D. Accelerating Research Impact in a Learning Health Care System: VA's Quality Enhancement Research Initiative in the Choice Act Era. *Med Care.* 2016 Dec 16.
6. Leeman J, Birken SA, Powell BJ, Rohweder C, Shea CM. Beyond "implementation strategies": classifying the full range of strategies used in implementation science and practice. *Implement Sci.* 2017 Nov 3;12(1):125. doi: 10.1186/s13012-017-0657-x.
7. Lyon A, Koerner K. User-Centered Design for Psychosocial Intervention Development and Implementation *Clin Psychol (New York).* 2016 Jun;23(2):180-200.
8. National Academy of Medicine (formerly Institute of Medicine). 2012. *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America.* Washington, DC: Institute of Medicine, National Academy Press
9. Powell BJ, Waltz TJ, Chinman MJ, et al. A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project. *Implement Sci.* 2015 Feb 12;10:21
10. Proctor EM, Silmere H, Raghaven R, et al. Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda. *Adm Policy Ment Health.* 2011; 38:65-76.
11. Ramchand, Rajeev, Terri Tanielian, Michael P. Fisher, Christine Anne Vaughan, Thomas E. Trail, Caroline Batka, Phoenix Voorhies, Michael Robbins, Eric Robinson, and Bonnie Ghosh-Dastidar, *Hidden Heroes: America's Military Caregivers.* Santa Monica, CA: RAND Corporation, 2014. [https://www.rand.org/pubs/research\\_reports/RR499.html](https://www.rand.org/pubs/research_reports/RR499.html).
12. Rosin R, Asch D. Innovation as discipline, not fad. *Engl J Med* 2015; 373:592-594
13. Shulkin DJ. Beyond the VA Crisis--Becoming a High-Performance Network. *N Engl J Med.* 2016 Mar 17;374(11):1003-5. doi: 10.1056/NEJMp1600307.
14. Taha HA. 1996. *Operations Research: An Introduction.* 6th edition. New York: Prentice Hall.
15. Government Accounting Office. *Managing Risks and Improving VA Health Care:* [https://www.gao.gov/highrisk/managing\\_risks\\_improving\\_va\\_health\\_care/why\\_did\\_study](https://www.gao.gov/highrisk/managing_risks_improving_va_health_care/why_did_study)
16. Weick, K. E., & Sutcliffe, K. M. (2015). *Managing the Unexpected: Resilient Performance in and Age of Uncertainty, Third Edition.* San Francisco, CA: Jossey-Bass.

# HSR&D RESEARCH PRIORITIES

## Health Service Research Priorities

\*ORD Clinical Priorities

Suicide Prevention*	Opioid/Pain*
Access to Care	Long-term Care/Aging
Mental Health/PTSD*	Health Care Informatics
Women's Health	Health Equity
Health Care Value	Quality/Safety
Primary Care Practice	Population Health/Whole Health
Disability/SCI/TBI*	Virtual Care/Telehealth

## Cross-cutting HSR Methods

- Implementation Science/Provider Behavior
- Complexity Science/Health Systems Engineering
- Data/Measurement Science

## Legislative Priorities

- MISSION Act
- Comprehensive Addiction & Recovery Act

## ORD-wide Research Priorities



Expand Veterans' access to high quality clinical trials



Increase substantial real-world impact of VA research



Transform VA data into a national resource