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# TBM

# Research translation for military and veteran health: research, practice, policy

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## Abstract

Military service presents unique challenges and opportunities for health care and public health. In the USA, there are over 2 million military servicemembers, 20 million veterans, and millions more military and veteran family members. Military servicemembers and eligible family members, many veterans, and retirees receive health care through the two largest learning health care systems in the USA, managed and delivered through the Departments of Defense (DoD), Veterans Affairs (VA), and contracted health care organizations. Through a network of collaborative relationships, DoD, VA, and partnering health care and research organizations (university, corporate, community, and government) accelerate research translation into best practices and policy across the USA and beyond. This article outlines military and veteran health research translation as summarized from a collaborative workshop led by experts across health care research, practice, and administration in DoD, VA, the National Institutes of Health, and affiliated universities. Key themes and recommendations for research translation are outlined in areas of: (a) stakeholder engagement and collaboration; (b) implementation science methods; and (c) funding along the translation continuum. Overall, the ability to rapidly translate research into clinical practice and policy for positive health outcomes requires collaborative relationships among many stakeholders. This includes servicemembers, veterans, and their families along with researchers, health care clinicians, and administrators, as well as policymakers and the broader population.

## Keywords

Military, Veteran, Research translation, Implementation science, Evidence-based health care

Presenting both a challenge and an opportunity for health improvement, U.S. military veterans are disproportionately burdened by preventable illnesses and health-risk behaviors compared to the general civilian population [1–3]. For example, the prevalence of tobacco and alcohol misuse is higher among active-duty servicemembers than civilians [2]. The Department of Defense (DoD) and Department of Veterans Affairs (VA) oversee two of the largest learning health care systems in the USA through the Military Health System and Veterans Health Administration and have greatly reduced the health burdens and disparity experienced by

## Implications

**Practice:** Researchers are available for brief consultation and partnership with clinicians, patients, and administration to support evidence-based research translation into practice through quality improvement and research projects for best performance and outcomes.

**Policy:** Policymakers wanting to increase evidence-based policy and better health for servicemembers and veterans can support policies that directly encourage research translation, as well as increase funding and other opportunities for best research and practice.

**Research:** To more rapidly and effectively improve evidence-based health care practice and policy, it is imperative for researchers to collaborate with multiple stakeholders as partners for research translation in all phases, from design and funding to implementation and dissemination of results.

military and veterans while improving broader public health through research translation to practice and policy [1,4–6]. Furthermore, VA hospitals consistently outperform private sector hospitals in most health care markets on many standard measures of care quality from appointment wait times to 30 day risk-adjusted mortality rates and other patient safety indicators [7,8].

DoD and VA are ideal settings for knowledge translation across the research, practice, and policy continuum for the health of military servicemembers, veterans, and their families. DoD's primary health care mission is to maintain force readiness among the 2 million military servicemembers and oversee health care benefits for an additional 7 million beneficiaries including military retirees and family members [9]. VA administers benefits for up to 20 million living U.S. veterans and provides health care for 9 million of them [1,10,11]. VA further has

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an educational training mission where the majority of U.S. physicians and many other clinicians and staff complete training, research, or other career rotations through VA (as are many trained through DoD rotations and military service) [12]. Leveraging these systems to improve research translation directly benefits veterans, servicemembers, and clinicians. The knowledge gained has improved care across the many health care systems in the USA, and continuous improvement is highly warranted to increase the efficiency and impact of research translation for best health care.

The primary aim of this article is to advance research translation knowledge within and across DoD, VA, and connected community care systems and universities to promote the health of servicemembers, veterans, and their families. This article exhibits key themes and recommendations for improving the translation of research into health care practice that emerged from a preconference course delivered at the Society of Behavioral Medicine (SBM) 2017 Annual Meeting. The course was a collaborative event with clinical, research, and policy experts from VA, DoD, and other organizations. Participants developed recommendations for best practices around three key themes: (a) stakeholder engagement and collaboration; (b) implementation science methods; and (c) funding along the translation continuum.

### COURSE METHODS
We developed a 9 hr preconference course workshop to discuss behavioral medicine and broader health research translation, deliberate about priority areas for success, and enhance connectivity among graduate students, researchers, clinicians, administrators, leaders, and funders across DoD, VA, the National Institutes of Health (NIH), university, and other settings. The course's key aims were to: (a) educate clinicians, researchers, funders, and administrators about DoD and VA translational research, challenges, lessons learned, and funding; (b) promote greater collaborative research and programs between VA, DoD, and other organizations; and (c) identify practices that facilitate greater partner-based research with various stakeholders, including leadership, clinicians, veterans, and servicemembers. A total of 82 researchers, practitioners, administrators, and funders from DoD, VA, NIH, and university affiliates participated, with 37 (45%) considered in a dual role as workshop faculty and participant. Some participants were graduate students, researchers, or clinicians interested in or in the early stages of military and veteran health work (e.g., 0–5 years postgraduate), and the majority were well experienced in the field (e.g., 10–50 years of postgraduate experience). Approximately half of the participants were current servicemembers or veterans.

Methods of facilitated deliberative process [13,14] were employed throughout the event, and this article reports the facilitated process takeaways, identifying key themes and recommendations for improving research translation for servicemember, veteran, family, and broader population health. For the course, faculty experts presented within four main plenary sessions (~50 min each) on the topics of: (a) research translation; (b) real-world needs, practice, and policy; (c) funding; and (d) relationships, capacity building, and military/veteran engagement (Supplementary Appendix A). At the end of each plenary session, course attendees asked questions and shared opinions and experiences before participating in 50 min small group discussion and deliberation sessions. Small group sessions were facilitated by a research, administrative, or clinical expert in subtopic areas. Facilitators prepared a general set of questions and prompts to initiate discussions while allowing the overall dialogue to be guided naturally through participant engagement. Small groups also collectively summarized what they learned during the preceding plenary session and identified implications for DoD and VA research, practice, and policy. Each small group session then concluded in a brief open period where small groups reported back within the larger collective group to discuss challenges, opportunities, and solutions for military and veteran health research translation. The day concluded with a 50 min collective group debriefing of the course's primary themes and next steps for effective research translation for military and veteran health. Detailed notes were taken throughout the course so that key takeaways could be shared back with attendees in the closing debriefing and in this article.

Course leadership also conducted a postcourse online survey for quality improvement and informative purposes for SBM and the Military and Veterans Health Group. Thirty-four participants (41%) completed the survey. Approximately 90% of respondents reported that they would use the information presented in the course to improve their clinical, research, or policy work. Participants identified the strengths of the course, with the most frequent strengths reported in the area of capacity building through collaboration onsite and for the future. As examples, three distinct responses on strengths were: (a) "networking opportunities at breakout sessions"; (b) "getting all the relevant people in the room from multiple agencies"; and (c) "collaboration between VHA and DoD researchers, clinicians, and policy leaders." The course was among the highest attended SBM preconference courses in SBM history and had a high course satisfaction rate. This suggests a high interest in military and veteran health among SBM members and associates. While it is possible that only those with positive experiences responded,

the 41% survey participation rate paired with high overall attendance and satisfaction among respondents suggests a prevalent interest and value for this type of collaborative events and the subject of military and veteran health among SBM members and associates.

## THEMES AND RECOMMENDATIONS FOR MILITARY AND VETERAN HEALTH RESEARCH TRANSLATION

### Stakeholder engagement and collaboration

Effective collaboration and partnerships are key components of successful research translation [15]. It is critical for all parties to work efficiently and comprehensively toward addressing health care needs while avoiding common collaboration pitfalls [16]. Primary stakeholder groups for military and veteran health include servicemembers and veterans, as well as researchers, clinicians, staff, and leadership from DoD, VA, and associated organizations in the community (Fig. 1). Secondary stakeholders include public policymakers and the broader population. While engaging such a broad array of stakeholders can add more time and effort initially, the overall process is improved, with resultant evidence-based changes likely more efficient through better informed, developed, and accepted interventions, programs, and policy.

*Engaging servicemember and veteran stakeholders*
Research is more likely to be translated effectively if it is meaningful and valuable to the intended population. Common servicemember and veteran stakeholder groups include VA and DoD patients, military commanders, and other military decision-makers who are themselves veterans, as well as veterans service organizations, many of which provide a solid legislative lobby for their fellow veterans (e.g., nonpartisan veteran-run organizations, such as Disabled American Veterans, The American Legion, and Veterans of Foreign Wars). Other veteran stakeholder groups include formal and informal veteran peer networks, such as VA peer support specialists and friends, acquaintances, and coworkers throughout other organizations, communities, and online platforms.

Two examples of how stakeholder engagement directly influenced DoD-funded research projects come from the STRONG STAR Consortium (South Texas Research Organizational Network Guiding Studies on Trauma and Resilience; www. STRONGSTAR.org [17,18]). The first project (*Strong Families Strong Forces*) focused on strengthening and supporting family relationships throughout the deployment cycle for military families with young children [19]. Through individual and small group



**Fig 1** | Research translation for military and veteran health.

qualitative interviews and the iterative process detailed in Fig. 2, military parents served as stakeholders and helped develop the actual intervention that was then used in the randomized clinical trial. The second project (*Enhancing Resiliency and Optimizing Readiness in Military Special Forces Trainees* [20]) is similarly engaging military special forces cadre in collaboration with civilian investigators to develop a brief psychological health intervention to enhance resiliency and optimize readiness in military special forces trainees.

Research translation in DoD, VA, and community-based settings must ensure military cultural competence as military and veteran populations have their own unique views, values, structures, terminology, and customs [21,22]. Hiring researchers, assistants, and clinical staff who are servicemembers or veterans themselves can promote culturally appropriate research design, systems navigation, implementation, and translation. Conversely, some servicemembers and veterans may prefer civilian staff depending on various stigmas, such as past traumatic experiences during military service, moral injury, or perceptions of their own service that may alienate them from a positive military identity. Either way, if the research team does not have substantial, direct military and veteran cultural competence, it may be necessary to consult or hire military servicemembers or veterans.

DoD and VA are increasingly prioritizing servicemember and veteran engagement throughout the research process. This involves the engagement of servicemembers and veterans during research conceptualization, study design, IRB review, study execution, interpretation of results, and dissemination. For example, VA's Health Services Research and Development Service (www.hsrd.research.va.gov) now has veteran engagement committees assisting in all aspects of research and has developed an extensive publicly available veteran engagement toolkit [23,24]. For one of the group's projects [25], researchers consulted veterans in the design and testing of mobile application software ("apps") for posttraumatic stress disorder and other conditions, as well as how to best conduct the evaluation of the apps' effects on satisfaction, access, and quality of care. Veteran insights regarding likely predictors of sustainability and dropout were noted as particularly beneficial.

*Engaging researchers, practitioners, and leadership*

To enhance and accelerate the translation of research findings into health care practice, DoD and VA have a long history of using partnerships among researchers, clinicians, health care facility leaders, public health officials, and senior policy leaders across many organizations. Such partnership-based relationships are typically aligned with priority needs identified by frontline clinicians, researchers, or leadership (Table 1); draw from an expansive network of informal and formal relationships; and emerge into formal partnerships through research or operations projects, committees, consortiums, contracts, and formal policy documents. DoD's Primary Care Behavioral Health Program exemplifies best practices for collaborative partnership through military clinician researchers and leadership teaming to integrate behavioral health into primary care for servicemember resiliency [26,27]. VA's Quality Enhancement Research Initiative (QUERI)

## Strong Families Strong Forces

Multiphase Approach to Engage Military
Stakeholders in Research



**2. Synthesize Feedback**
Ten team members reviewed transcripts to identify important themes to be addressed in the Strong Families Strong Forces Manual.

**4. Advisory Board**
A small group of active duty service members and spouses were recruited to give feedback about the amended manual content.

**1.Qualitative Interviews**
Conducted individual qualitative interviews with active duty service members, spouses, and key informants (e.g., military providers, military leadership, etc.) in order to understand the needs of active duty military families pre, during, and post deployment.

**3. Amend Manual**
Primary developers edited the manual to address feedback from qualitiave interviews.

**5. Conduct Research**
One hundred and fifty active duty military families who were about to experience a deployment were recruited to participate in the research study.
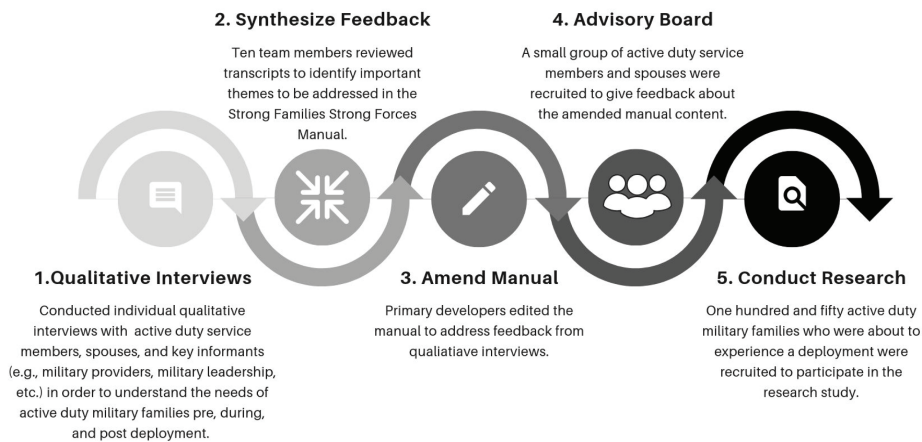
**Fig 2** | Example of stakeholder engagement with key informants and an advisory board. This figure outlines the process of stakeholder engagement used to help develop the intervention and manual for the Strong Families Strong Forces study [19]. After initial planning, the process started with recruiting and interviewing key informants, then feedback analysis, manual amendment, and forming a stakeholder advisory board for feedback on the amended manual and intervention leading up to the actual implementation of the intervention study.

**Table 1** | Stakeholder needs and recommended strategies for effective partnership in research translation

| Stakeholder group | Needs and interests examples | Strategy examples |
|---|---|---|
| Military and veteran populations | Awareness of research and information that helps make sense of evidence and how it applies to their unique needs or interests<br><br>Opportunities to both help improve and disseminate research. Servicemembers, veterans, and their family generally want to help improve the systems they or their fellow veterans, friends, or loved ones are using<br><br>Ability to stay engaged in research if transferred in the military or move residences out of the area where research participation began | Conduct work *with* rather than *on* military and veteran populations; understand and work with military/veteran priorities, customs, culture, and chain-of-command structures<br><br>Information toolkits (e.g., brochures, flyers, online information, and other promotional materials) for researchers and partners to share<br><br>Use formal and informal servicemember or veteran engagement strategies (e.g., veteran engagement committees; utilize co-investigators, staff, and consultants who are servicemembers or veterans)<br><br>Researchers maintain contact information, follow-up with participants in longitudinal studies, and account for transfers or moves in design. |
| Clinicians | Tools for evaluating clinical programs | Work with colleagues, researchers, and academic institutions to find or develop evaluation tools |
| | Mechanisms for communicating about their innovations, perspectives, concerns, and firsthand observations to researchers and decision-makers | Consult researchers and decision-makers about their interests and how best to share them with others |
| Researchers | Skills and platforms for communicating findings to nonacademic audiences | Communicate study findings and implications with simple terms, case studies/vignettes, and infographics, highlighting key takeaways meaningful to the target audience<br><br>Capture practitioner and other stakeholder perspectives using mixed-methods approaches<br><br>Consult representatives from nonacademic audiences of interest on how best to communicate results to these groups. See also strategies above and below in this table. |
| | Skills for designing and opportunities for funding translational research | Participate in professional development training<br>Funding opportunities requiring greater servicemember and veteran engagement as partners throughout the research process |
| | Because military researchers can be regularly ordered to transfer to other duty assignments or deploy, they must plan ahead to adapt as changes occur. | Use information technology, plan into study design for transfers, have designated back-up coinvestigator to take the helm in the event of deployments or short assignments where a researcher is not available for a period |
| Policymakers/ leadership | Data on effectiveness and costs, feasibility of implementing and sustaining projects, programs, and policies | Clear, specific, and succinct information tailored to a broad audience of leaders and policymakers, researchers partnering and consulting representatives from these groups or consultants for best formats and practices |
| All | Increased opportunities for learning and collaboration within and across DoD, VA, other governmental agencies, corporations, foundations, universities, and communities; Courses and training opportunities; creation of an integrated medical record and other technological tools; practice-based research networks; collaborative funding initiatives | Develop, market, and advertise to both broad and specific audiences—seminars, courses, and other programs and opportunities for learning, networking, and collaborating through all venues<br><br>Communicate and negotiate with partners at each step of the process, from initial research development through implementation; include clinical and leadership partners on manuscripts and conference presentations |

is a model VA research program that facilitates partnership-based evaluation by supporting quality improvement projects with both operational and patient care funding at the interface of research and practice through an array of stakeholders [28,29].

An exemplar VA program at the interface of stakeholder engagement across administrative, policy, and research leaders for health innovation is a study entitled, "Aligning policy and healthcare services with Veterans' values and preferences for results from Whole Genome Sequencing" [30]. This project emerged out of a movement in VA's Health Services Research and Development Service over the last decade to engage VA health care policy leaders as partners in research. Research project leaders consulted health care leaders from VA's Genomics Medicine Service, Genetic Counseling Service, and VA's Million Veteran Program how they might best

study veteran preferences for receiving genetic information as a part of their health care or from research. Through collaborative discussions among the researchers and VA genomic medicine and research leaders, the project transitioned from single-gene testing to study the emerging challenge of returning valuable, yet complex, whole-genome sequencing results to veterans to inform diagnosis and treatment, based on veteran preference. The study is now using a sequential mixed-methods design (qualitative-quantitative-qualitative; project years 2017−2021) with focus groups and interviews in Study Aim 1, then a national population-based survey of veterans (Aim 2), and culminating with facilitated deliberative process groups with national VA executives (Aim 3). The primary impact intent of the study is to inform VA executive decision-making on how to best disclose and deliver results with veterans about their own individual genomic information and help veterans interpret the results in alignment with veteran views and values for best health.

Recommendations made during the course complement those in VA-based work for effective partnerships in quality improvement and research translation [29,31]. For example, to be effective and mutually beneficial, partnerships must involve respectful, ongoing, and bidirectional communication throughout all project phases. Policymakers and researchers can learn from practitioners and other local partners about: potential feasibility issues, redundancies with existing programs or initiatives, and ways to integrate with existing positive strategies. All parties benefit when researchers contact potential partners early during study development to ensure research and future implementation plans align with clinical and policy priorities. It is particularly important for partners to share regularly and ensure mutual understanding of clinical priorities, policy, and research findings, including implications at the local through broader systems levels.

A VA initiative to optimize stakeholder involvement across sectors is through the new VA Innovation Center, engaging across researchers, practitioners, and leaders from VA, public sectors, and industry to "solve the hardest problems impacting VA and our Veterans" (www.innovation.va.gov).

Researchers and program office policymakers can further spread innovation and best practices across practitioners and clinical leaders who often appreciate updated knowledge, tools, and systems. However, this information needs to be shared in a way that is beneficial, meaningful, and directly applicable to clinicians, leadership, and the populations they serve to maximize adoption and minimize negative perceptions or burdens. It's also crucial to ensure respect for servicemembers and veterans, as well as consider potential negative consequences of findings for other stakeholder groups and health care organizations throughout the study and dissemination process—balancing transparency, confidentiality, and organizational missions.

The VA National Center for Health Promotion and Disease Prevention (NCP) [32] exemplifies best practices for collaborative partnership (Fig. 3). NCP is charged with overseeing and supporting VA health education, health promotion, and prevention programming, such as VA's national weight management program for veterans: VA *MOVE!*. As an example of NCP collaboration, researchers from VA Ann Arbor's Health Services Research Center for Excellence worked together with three clinical demonstration project sites to study a diabetes prevention program's implementation in VA and compare its effectiveness to VA's *MOVE!* at selected sites [16]. The group used a pragmatic clinical trial [16], a real-world practice-based design used to address potential tensions between clinical and research activities, accelerating the typical research to practice pipeline. Compared with *MOVE!*, diabetes prevention participants had higher participation rates and

**Key Attributes and Strategies:**

- Bidirectional knowledge transfer (including preferred approaches from leaders, "on the ground" clinicians and project staff)

-Learn about existing clinical programming, including what's working and what's not; barriers and facilitators to program success

-Leverage existing policy, resources and programs to facilitate subsequent integration and implementation

-Participate in academic societies (e.g., SBM) to learn about and shape translational behavioral medicine research

- Serve as conduit between researchers and healthcare system clinical leaders and staff
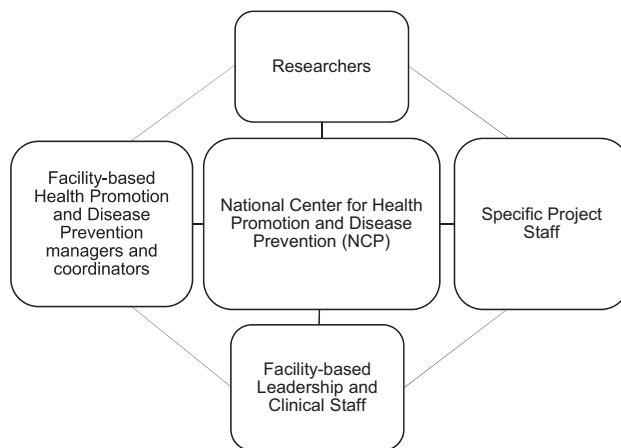
- Employ a genuine collaborative spirit

Fig 3 | VA National Center for Health Promotion and Disease Prevention (NCP) Partnership Model.

weight loss at 6 months but similar health outcomes and expenditures at 12 months [33,34]. Numerous takeaways regarding partnered research were identified, including the challenge of balancing scientific rigor with a need for rapid dissemination, benefits of having a shared goal for the work, and the value of building on longstanding, trusted relationships. The collaboration also informed national program improvements disseminated across hundreds of VA medical centers and outpatient clinics.

DoD research partnerships have unique considerations compared to civilian and VA environments. For example, translation research activities must fit the priorities of the military health care group or command while remaining agile due to the transitory nature of military service, training, and operations. Military leadership, units, and participants often deploy on short notice, transfer to different regions every 2−4 years, and have greater restrictions on privacy and confidentiality. In some military environments, such as those involving military trainees, there is a greater potential for commander or supervisor coercion to participate in research. In many of these situations, a research ombudsman is appointed to help ensure that there is no coercion by higher-ranking military personnel to influence research participation by lower-ranking servicemembers. Navigating these considerations is vital for command trust, participation, and overall success of translation efforts in DoD. Successful strategies include clear informed consent and contact information, regular follow-up, and researchers, consultants, and staff who are veterans or servicemembers. Many DoD research projects also require cooperative agreements, negotiated among DoD, other government agencies, and university investigators before initiating research, which outline their mutually agreed upon roles and responsibilities.

DoD provides another prime example of best practices for a collaborative partnership in its integrated Primary Care Behavioral Health Program [26,27]. Over decades and with persistence, DoD clinicians, researchers, and leaders collaborated through research translation efforts to integrate behavioral health into primary care. This ultimately resulted in a policy requiring its implementation throughout DoD, outlining expected staffing levels, core professional staff competencies, behavioral health screening requirements, and establishing an oversight committee to coordinate program training, implementation, and evaluation efforts [35].

Collaborating across VA and DoD settings is also on the rise. For example, DoD and VA experts have been collaborating on research and quality improvement efforts for integrated primary care and behavioral health [36], ensuring behavioral health consultants and other clinicians have evidence-based tools, training, and programs for best practice [37]. The DoD−VA-led Applied Proteogenomics Organizational Learning and Outcomes Network is collecting a prospective repository of real-world data to support research translation and clinical activity for cancer prevention and control [38]. And the broadest initiative underway that could facilitate research and translation across DoD and VA health care systems is the electronic health record modernization into a shared DoD−VA platform (www.ehrm.va.gov). These initiatives, programs, and studies allow for more rapid, direct, and collaborative communication among researchers, practitioners, and administrators across DoD, VA, and affiliated organizations.

A number of factors underscore the need to conduct translational research and collaborate outside of VA and DoD, such as facts that approximately 60% of veterans do not receive VA health care [10] and many servicemembers and their family receive care outside of military hospitals when living in areas without enough volume for military care or specific specialty care (e.g., stationed at smaller bases or centers). VA further contracts some of its services through community care based on whether VA can provide a specific service in time or within a reasonable commuting distance for the veteran. To best promote the health of military and veteran populations, research also must be translated to non-VA and non-DoD health care settings, such as private health care systems, community organizations, state and local agencies, and through public policymakers [39].

*Engaging policymakers and the broader public as stakeholders*
Collaboration across DoD- and VA-associated health care, university settings, and other organizations provides immense opportunities to improve overall health care and population health in the USA, making public policymakers and the overall U.S. population secondary stakeholders for military and veteran health. There are also prohibitions on using federal dollars, time, and positions to engage in partisan political activity or to directly lobby for policy and legislative changes [40]. Therefore, from federal and other positions, it is important to increase awareness and educate policymakers and the public in a nonpartisan manner through all avenues (e.g., media, congressional information requests, veterans service organizations, and patients) so that we all can make more informed decisions as we advocate and work together for military, veteran, and population health.

### Implementation science methods

The field of implementation science continues to develop and enhance translational research and improve health services, from the individual patient-provider level of care to programs, systems, and public health levels. One of the most widely applied implementation science frameworks is the Consolidated Framework for Implementation

Research (CFIR), developed by VA implementation scientists to examine factors influencing the uptake of health care innovations [41]. CFIR promotes the use of standardized terminology across implementation studies, thereby facilitating discernment of relationships among factors, context, and implementation effectiveness, as well as reporting across studies through systematic reviews and meta-analyses.

A major development over the last decade to further speed the translation of research findings into clinical practice was the creation of hybrid implementation-effectiveness designs [42]. The hybrid designs allow researchers to test the clinical effectiveness of promising new interventions while exploring contextual factors affecting intervention uptake and strategies to facilitate more rapid proliferation and sustainment of these practices in regular health care settings. VA implementation researchers also held a central role in the Expert Recommendations on Implementing Change (ERIC) project that further developed a refined compilation of implementation strategies and terminology to improve the conceptual clarity, relevance, and comprehensiveness of implementation science [43]. The primary goal was to enhance implementation research to facilitate positive change in practice and, ultimately, better patient outcomes. In one of the latest largescale VA implemenation science projects, researchers are applying CFIR and ERIC to combat the opioid epidemic by evaluating implementation strategies, barriers, and facilitators of VA's new Stratification Tool for Opioid Risk Management (STORM; a dashboard to assist clinicians with opioid risk reduction) [44].

Implementation science methods and strategies can further be applied outside of research in program evaluation and quality improvement projects. Implementation projects should be practical, with representative samples of the population of interest, and delivered in real-world clinical settings to facilitate rapid and successful uptake in practice [45]. For example, the VA Office of Mental Health and Suicide Prevention initiated and funded a multisite demonstration project to examine the feasibility and acceptability of meditation programs for posttraumatic stress disorder prior to efficacy testing [46]. Many of the programs were already being delivered in VA based on popularity, demand, outside research, and the nonpharmacological nature of meditation. Due to government stakeholder interest and clinician-researcher request, operational funding was approved, the evaluation conducted, and results published [47,48]. Many such evaluations make sense as quality improvement or rapid evaluation projects to accelerate access to helpful treatments, delivered in routine health care settings.

One of the primary contributors to proliferation of implementation science and evidence-based quality improvement projects in VA over the past 20 years has been VA QUERI, which is guided by three major goals: (a) rapidly translate research knowledge and evidence-based treatments into clinical practice; (b) increase impact of VA research findings through bidirectional partnership, rigorous evaluation, and communication; and (c) make VA a national leader in promoting a learning health care organization through innovative implementation science [28]. QUERI funds implementation and quality improvement projects and provides substantial tools and training opportunities for VA researchers, clinicians, and leaders to enhance the translation of evidence into practice from proliferation of best practices [49] to deimplementation of obsolete or wasteful practices [50].

### Funding along the translation continuum

Funding and translating findings into policy and practice is a critical part of health care research. Individual funding generally begins through smaller pilot funding or grants (e.g., $5,000−$100,000 each) during postdoctoral fellowships (Fig. 4). The transition to a full-time research career is often supported by career development awards (e.g., 75% protected time to full salary and start-up funds for research over 3−5 years) or other junior researcher or faculty salary support through university, corporate, community, or government positions, with a longer-term career goal of obtaining research Level 1 funding (e.g., VA I01 or NIH R01, ˜$500,000−$1.3 million each). The process of obtaining pilot funding leading to larger funding awards generally repeats throughout a typical research career, as well as a host of other funding opportunities for ancillary projects and research groups.

Primary funders of military and veteran health research are managed under the Congressionally Directed Medical Research Program (cdmrp.army.mil), the US Army Medical Research and Development Command (mrdc.amedd.army.mil), and VA's Office of Research and Development (www.research.va.gov). NIH and a host of private foundations further support health research for military servicemembers, veterans, and their families. There are also collaborative funding opportunities among DoD, VA, NIH, and other research funding groups. For example, the NIH, DoD, and VA released the NIH−DoD−VA Pain Management Collaboratory initiative to fund pragmatic clinical trials on nonpharmacological approaches to pain management among servicemembers, veterans, and their families [51]. Rarely does each individual researcher have substantial familiarity with each funder, so collaboration with colleagues across research groups and organizations is critical to diversify individual or group-funding portfolios.
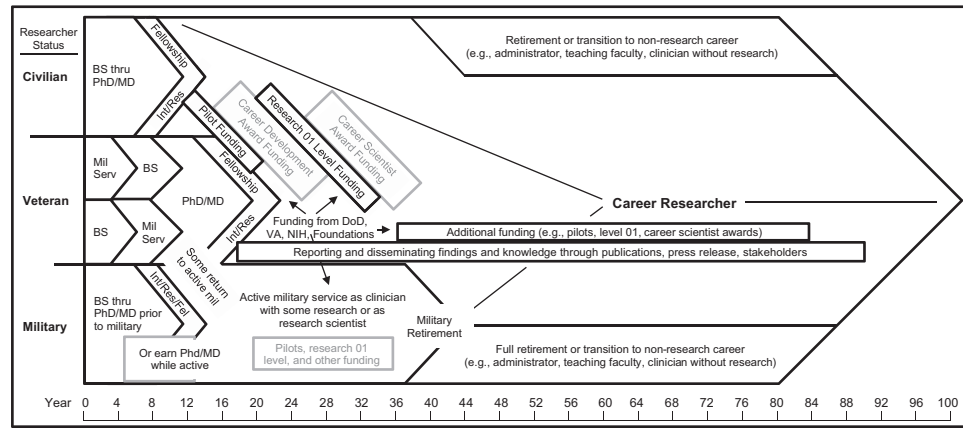
**Fig 4** | Common Military and Veteran Health Researcher Career Paths and Funding. BS = Bachelors of Science [degree]; DoD = Department of Defense; Fel = Fellowship; Int = Internship; MD = Medical Doctorate [degree]; Mil Serv = Military Service; NIH = National Institutes of Health; PhD = Philosophy Doctorate [degree]; Res = Residency (medical); VA = Department of Veterans Affairs. Timeline of Year 0 would typically begin at age 18 after high school graduation, signifying Year 0 on a person's path to career research, which typically begins in undergraduate degree studies with a scientific focus (e.g., Bachelor of Science) and progresses through doctoral education (most common is PhD, secondary for health research is MD as well as DO, DNP, DPT, DC, DMD, DrPH, EdD, JD, etc.) and training (e.g., fellowships but also residency or internships for MDs, clinical psychologists, and other clinician tracts) to becoming a full career researcher. The timeline corresponds to estimated time along the career continuum, such as 4 years to earn an undergraduate degree or for a standard military enlistment, an additional 3–5 years for a PhD/MD, a 2 year fellowship, and earliest career researcher status at around year 10 and extending as many as an additional 90 years. An active duty military researcher's career typically begins after earning a doctoral degree with entrance into active duty for residency or internship as a clinician that also does research, in some cases as a scientist, and military retirement typically occurs after 20–40 years of service (mandatory age removal at age 62 years). Gray lines and font on items such as the career awards are to signify that these are not as common as the black lined, more standard training, and funding streams for researchers.

To ensure research is relevant to real-world needs and translates to evidence-based practice and policy, DoD and VA funders increasingly require evidence of existing or potential operational partners in letters of support and research strategy sections of funding applications. Partner examples are clinicians, military line unit commanders, senior leadership, or program office leadership, varying based on the setting and focus of the study. Funders evaluate prior research publications and progress reports to determine whether applicants have track records of disseminating their work and promoting evidence-based programming and policy changes. Funders also look for evidence that early career applicants have the potential to achieve these outcomes. Researchers must balance interests among stakeholders (e.g., operational partners, servicemembers, and veterans) and funders by having solid stakeholder relationships and research plans guided by scientific evidence and appropriate methodology. Funders tend to be most concerned with scientific evidence and methodology but also want to ensure there is stakeholder buy-in and understanding for project relevance and success.

Most importantly, applicants must follow basic funder guidance, such as agency instructions, and ensure that the application is clear, concise, well written, and innovative. Missing crucial information or forms can result in application rejection and missing a cycle of review. Reviewers will further score an application poorly if it is difficult to read, the content does not exhibit solid command of the research area or funder, or if the research questions have already been studied sufficiently. To mitigate many of these pitfalls, research groups typically pair newer researchers with more experienced mentors and conduct preliminary, semiformal internal reviews before investigators submit applications to the funding agencies. In addition to working with more experienced colleagues, it is important to establish relationships with funding program managers and gain insight into what their agency and funding group are looking for. Researchers must also balance the quantity and scope of their work with quality and precision based on their own and collective team knowledge, skills, and abilities to ensure that their research work and career paths have the greatest balance of quality and impact with fiscal responsibility.

## CONCLUSIONS

Determining best practices and policy through translation research and quality improvement is imperative to enhance servicemember, veteran, and broader population health. There are numerous opportunities but also strong competition for funding of research and quality improvement, necessitating solid partnerships for success. Research partnership requires collaboration, communication, time, patience, flexibility, creativity, respect, and dedication. Military and veteran research must be designed with the study population and other stakeholders' organizational and operational missions and vision in mind. Partnering with

stakeholders is an essential part of successful research translation. Balancing stakeholder involvement while conducting science with integrity and rigor best advances servicemember and veteran health. Meeting these criteria is an art form and requires collaborative, respectful relationships and ongoing, clear, and efficient communication across a vast array of stakeholders, most importantly—the researchers themselves in partnership with servicemembers, veterans, and their families. Research and clinical knowledge gained and applied through military and veteran health care systems offers many benefits that extend well into schools of medicine, universities, and community health care across the nation for overall population health.

## SUPPLEMENTARY MATERIAL

Supplementary material is available at *Translational Behavioral Medicine* online.

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