Transformation of Mental Health Care for U.S. Soldiers and Families During the Iraq and Afghanistan Wars: Where Science and Politics Intersect

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The cumulative strain of 14 years of war on service members, veterans, and their families, together with continuing global threats and the unique stresses of military service, are likely to be felt for years to come. Scientific as well as political factors have influenced how the military has addressed the mental health needs resulting from these wars. Two important differences between mental health care delivered during the Iraq and Afghanistan wars and previous wars are the degree to which research has directly informed care and the consolidated management of services. The U.S. Army Medical Command implemented programmatic changes to ensure delivery of high-quality standardized mental health services, including centralized workload management; consolidation of psychiatry, psychology, psychiatric nursing, and social work services under integrated behavioral health departments; creation of satellite mental health clinics embedded within brigade work areas; incorporation of mental health providers into primary care; routine mental health screening throughout soldiers' careers; standardization of clinical outcome measures; and improved services for family members. This transformation has been accompanied by reduction in psychiatric hospitalizations and improved continuity of care. Challenges remain, however, including continued underutilization of services by those most in need, problems with treatment of substance use disorders, overuse of opioid medications, concerns with the structure of care for chronic postdeployment (including postconcussion) symptoms, and ongoing questions concerning the causes of historically high suicide rates, efficacy of resilience training initiatives, and research priorities. It is critical to ensure that remaining gaps are addressed and that knowledge gained during these wars is retained and further evolved.

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War has historically been a crucible that catalyzes advances in medical care. The recent wars in Afghanistan and Iraq are no exception, producing the highest survival rates for wounded service members with breakthroughs in acute hemorrhage management, forward surgical support, and rapid air evacuation. These wars have also generated unparalleled efforts compared with past conflicts to mitigate the immediate and long-term neurological and psychological effects of war. At the start of the Afghanistan and Iraq invasions, senior Army and Department of Defense (DOD) leaders invested in research to measure the mental health impact and shape the development of clinical policies and programs. Studies conducted during these wars have shown that the risks of posttraumatic stress disorder (PTSD), depression, and other mental health problems are comparable to past wars (1, 2). Research on stigma and barriers to care have led to multiple efforts to enhance access. Studies have led to increased awareness of the interaction between concussion (mild traumatic brain injury [TBI]) and PTSD (3, 4), and protocols for the treatment of battlefield concussions were implemented for the first time. Since 2007, Congress has appropriated unprecedented resources for the DOD and the Department of Veterans Affairs (VA) to support mental health research and clinical treatment.

Of all service branches and coalition forces, the U.S. Army has borne the greatest burden of ground combat operations, contributing 1.5 million personnel-years to Afghanistan and Iraq deployments between 2001 and 2011, compared with less than 1 million for all other services combined (Navy, Marines, Air Force) (5). The Army has also led the standardization and programmatic transformation of mental health care on the battlefield and at home, and Army research has had an ongoing influence on health care policy and practices across the DOD and VA.

The purpose of this article is to delineate key milestones in the transformation of mental health care for soldiers and their families, including how developments were directly informed by research as well as political factors. This article is intended to provide a road map through a body of literature important in understanding lessons concerning the provision of mental health services for veterans of the Iraq and Afghanistan wars, as well as preparation for future conflicts.

KEY RESEARCH INVESTMENTS

The U.S. Army has a history of investing in operational human-factors research through accession of doctoral research

psychologists, in addition to clinicians, trained to deploy and conduct research relevant to maintaining the health and readiness of the force. Building on experience gained during the Bosnia and Kosovo deployments (6) and through partnership between operational research psychologists, clinicians, and epidemiologists, the Army initiated a major research effort in 2002 to measure the mental health and neurological impact of the wars in Iraq and Afghanistan. An influential component of this investment was the Walter Reed Army Institute of Research Land Combat Study, which produced publications in top-tier journals (for both mental health and TBI) (2, 3, 7), provided data presented in multiple Congressional testimonies, and supported serial anonymous mental health assessments of Army and Marine operational personnel collected during deployment (8, 9). Key findings from the Land Combat Study included benchmarks of the prevalence of PTSD, depression, and other mental health problems before, during, and after deployment; critical findings on stigma perceptions and barriers to care; illumination of the complex interrelationship between battlefield concussions, PTSD, and postdeployment symptoms; and documentation of inadequate distribution of mental health services in the deployed environment that led to major revisions of doctrine, training, and personnel management (2, 3, 7–9). The methodology applied in the study for estimating PTSD prevalence (2) became the standard for hundreds of other research initiatives, facilitating comparisons across studies throughout these wars (1, 10, 11). A meta-analysis of studies from the Iraq and Afghanistan wars found a weighted average postdeployment PTSD prevalence of 5.5% in all deployed personnel (all services and nations, including support personnel) and 13.2% in line infantry units (1).

At the DOD level, the flagship epidemiological investment is the Framingham-like Millennium Cohort Study (11–13), initiated in 2000 to address ongoing health concerns of veterans of the first Gulf war (1990–1991). The Millennium Cohort Study is the largest prospective collection of health data on current and previously serving military personnel from all branches of service. Originally scheduled to run 21 years, the study was modified to include additional waves of service members every 3 years during the current wars, and it is now scheduled to continue for the lifetime of most participants (until 2067) (14). Additional DOD research investments followed as a result of increased Congressional funding starting in 2007, including several large multicenter research consortiums focused on clinical trials to refine or improve evidence-based treatments for PTSD or postconcussion symptoms (14). These included the Injury and Traumatic Stress Consortium, the South Texas Organizational Network Guiding Solutions on Trauma and Resilience, and the University of Texas Health Science Center and National Center for PTSD Consortium to Alleviate PTSD. The Army also funded a large epidemiological study, the Army Study to Assess Risk and Resilience in Service Members, to try to identify modifiable causes of increased rates of suicide among soldiers (15).

HISTORICAL HIGHLIGHTS, 2002–2009

The following timeline details research initiatives that directly influenced mental health care during the Iraq and Afghanistan wars and the most important instances when media exposure and politics intersected to catalyze key policy and programmatic decisions. This is not a comprehensive review of all research or high-visibility events resulting from these wars, but rather a highlight of studies and events that had direct influence on transforming the mental health care system. Table 1 provides a summary of key milestones in this historical overview.

2002–2003

Before 2002, mandatory postdeployment mental health screening consisted of a single question that asked whether service members had sought or intended to seek mental health counseling. In 2002, a cluster of murder-suicides at Ft. Bragg, N.C., involving soldiers who served in the initial Afghanistan ground operation made international headlines (16). The Army investigative team findings, combined with experience with early screening efforts in Bosnia and Kosovo (6), catalyzed a new deployment cycle support process, including the DOD decision to revise deployment screening. The 2003 postdeployment health assessment included, for the first time, questions on depression, PTSD, and safety (suicidal and homicidal ideation) (17).

2004–2005

An enhanced postdeployment screening pilot study conducted by investigators at the Walter Reed Army Institute of Research showed that soldiers were disinclined to report mental health concerns immediately on return from deployment, but a significantly higher proportion reported concerns 3–4 months later (18). As a result, in March 2005, the DOD expanded deployment screening to include a second assessment, the postdeployment health reassessment, 3–6 months after deployment (19). The Army also initiated research to better validate these screening instruments and provide guidance for effective implementation and further research (19–22).

2005–2006

Before 2005, mental health clinicians working in the deployed environment (known as combat-operational stress control personnel) were divided into prevention and treatment teams, which was confusing and inefficient for geographically dispersed units. Findings from the first two anonymous mental health assessments in Iraq demonstrated outdated policies and inadequate distribution of mental health personnel, with limited or no services to remote locations (8, 9). These findings, combined with a shift from a divisional war-fighting structure to smaller, more maneuverable brigade combat teams, led to extensive revisions of Army doctrine and training to support the mental health needs of deployed soldiers. Changes included revision of combat-operational stress control field manuals (23, 24) and

TABLE 1. Key Milestones in Army Mental Health Care Transformation[a]

Year(s) Initiated	Identified Problem	Response to Problem
2003 or before	Incomplete understanding of mental health effects of wartime service	Uniformed research psychologists Millennium Cohort Study Land Combat Study Serial mental health advisory team assessments in Iraq and Afghanistan
2003–2005	Inadequate postdeployment mental health screening	Postdeployment health assessment: expansion of mental health screening items Postdeployment health reassessment Validation of screening measures
2005–2006	Deficiencies in in-theater mental health services	Revision of combat-operational stress control field manuals for soldiers and leaders Publication of mental health standards for deployment Guidelines for use of psychotropic medications Increase in number of deployed mental health personnel Improved distribution of mental health personnel
2007–2009	Critical gaps in addressing postdeployment mental health needs (including stigma and other barriers to care)	Expanded funding for research and clinical programs Establishment of large clinical trial consortiums Establishment of Defense Center of Excellence for Psychological Health and Traumatic Brain Injury Publication of DOD/VA clinical practice guidelines for PTSD and mild TBI Revision of administrative separation policies Initiation of Comprehensive Soldier and Family Fitness program
Since 2009	Stovepiped, variable, poorly integrated, and/or redundant clinical services	Reorganization and consolidation of all mental health services under the Behavioral Health Service Line Increased mental health personnel Army-wide Embedded behavioral health Behavioral health in primary care Child and family behavioral health system Behavioral Health Data Portal Additional refinements in screening for PTSD and mild TBI PTSD assessment and treatment policy Revision of disability evaluation system

[a] DOD=Department of Defense; PTSD=posttraumatic stress disorder; TBI=traumatic brain injury; VA=Department of Veterans Affairs.

reorganization of training and distribution of mental health personnel across the battlefield. The field manuals also for the first time included guidance on the use of psychotropic medications in theater, which had previously been discouraged. The number of mental health professionals directly assigned to combat brigades was increased, and combat-operational stress units were divided into smaller teams distributed throughout theater that could each provide the full range of services. Mental health providers from other military services were also called upon to augment Army units. No previous era has seen as much direct forward-deployed mental health support to frontline troops.

In 2006, media reports emerged asserting that the DOD was deploying personnel who were not mentally fit (25), leading to policies that established mental health deployment standards. A program evaluation was then conducted using a quasi-experimental design; units that received close care coordination combined with mandatory screening according to the new standards experienced significantly better mental health outcomes during deployment than comparable units that did not have care coordination (25). Approximately 3% of deployed soldiers were taking psychotropic medication, most commonly selective serotonin reuptake inhibitors for depression or anxiety, and a key component of program effectiveness was likely the active coordination of refills through the medical chains of command (rather than waiting for soldiers to come forward to ask for them).

2007

Along with emerging knowledge on stigma and barriers to care, the *Washington Post* published a pair of articles exposing poor living conditions and problems with wounded warrior care at Walter Reed Army Medical Center. News stories from Ft. Carson, Colo., also raised concerns about soldiers with PTSD being inappropriately separated under administrative regulations. These articles ultimately led to the resignation of an Army Surgeon General, revision of administrative separation policies, Congressional testimonies, and high-level investigative commissions and task forces (26–28). Army research findings on the prevalence of mental health problems, stigma, and low utilization of services contributed to the recommendations of these committees (2, 8, 9, 17, 19). The end result was acknowledgment that existing clinical programs and staffing were insufficient to meet the mental health needs of returning service members. In response, Congress appropriated nearly $1 billion in 2007 for PTSD and TBI research and enhancement of treatment capabilities. This decision was followed by sustainment of higher funding in subsequent years, providing the necessary resources to drive the transformation of services. The increased funding also led

to research consortiums and establishment of the Defense Center of Excellence for Psychological Health and TBI, an organization tasked with providing leadership, knowledge, and coordination between the services and the VA. An unparalleled number of clinical trials involving psychotherapy or pharmacotherapy interventions and new delivery models (e.g., telemedicine) were initiated (14).

2008–2009

With the influx of resources, new challenges emerged. Local solutions to address deficiencies in psychological and TBI care proliferated at military posts, resulting in over 200 programs across the DOD that were poorly integrated, inefficient, or redundant (29). A 2008 study by the RAND Corporation was highly influential in heightening concerns about deployment-related TBI (30), although the scientific validity of the report's 19% TBI prevalence estimate in Iraq and Afghanistan veterans was questionable (31, 32). New programs also included nonmedical initiatives, such as the Army's Comprehensive Soldier and Family Fitness program to enhance resiliency, as well as alternative counseling options (e.g., Military Family Life Consulting, Military One-Source) to assist with occupational, relationship, grief, or family problems confidentially. The DOD and the VA increased collaboration to promote evidence-based practices, including publication of clinical practice guidelines for PTSD and mild TBI (33, 34), and the Army initiated a major effort to consolidate best practices and standardize mental health services across the enterprise.

TRANSFORMATION OF ARMY MENTAL HEALTH CARE: 2010–TODAY

Centralized Management and Reorganization of Services

Until 2010, the primary authority responsible for determining the number of mental health personnel and types of services was held by each commander at more than 30 different military treatment facilities worldwide. Hospital commanders, military providers, and unit leaders also rotated frequently between posts and deployments. As a result, wide variance developed in the continuity, structure, size, scope, and quality of clinical programs, as well as in coordination of care for soldiers with occupational impairment. Furthermore, services at most facilities were divided into separate departments of psychiatry, psychology, and social work. This stovepiped and poorly integrated system was confusing to patients, leaders, and other clinical specialties. To improve standardization and coordination of service delivery, policies, programs, and training, all mental health services (inpatient, outpatient, and residential) were consolidated under a program management office at the Office of the Army Surgeon General and Medical Command Headquarters in San Antonio, Tex., named the Behavioral Health Service Line. The intent was to implement a cost-effective, sustainable, outcome-focused system of care to ensure high-quality, efficient, and standardized services across the Army with clearly defined performance indicators. This system followed a public health model that incorporated population-based screening and enhanced services across the care continuum (including primary care). Discipline-specific departments at each installation were reorganized into single, integrated behavioral health departments, each under one clinical chief, mirroring the integrated practice units operating in other sectors of medicine (35). Clinical programs now comprised providers from all specialties oriented around the needs of patients, rather than provider disciplines. Coordination between treatment facilities within the same region and with the management team was enhanced through regional behavioral health directors. Systems were also established, through electronic processes and care managers, to improve continuity of services for soldiers undergoing deployments or transfers between posts.

Behavioral health services across the Army were consolidated under 10 core programs: inpatient, outpatient/multidisciplinary, intensive outpatient services, residential care for substance use disorders, tele-behavioral health care, family advocacy, and four novel programs (described below) focused particularly on enhancing and coordinating access (embedded behavioral health, behavioral health in primary care, and school-based behavioral health) and standardizing outcomes (the Behavioral Health Data Portal). A major emphasis on hiring increased the number of mental health providers across the Army from approximately 1,300 in 2007 to more than 3,000 today. Tele-behavioral health resources were expanded to provide regional support for primary care and mental health providers and direct care to sites with limited resources both in-theater and garrison. Electronic workload tracking and budget tools were implemented in 2013. These systems (visible to managers at every level) monitor each provider's clinical capacity and productivity compared with Army-wide standards, consolidate resourcing and staffing levels for mental health care, set expenditure parameters for each facility, and include facility incentives aligned with clinical outcome priorities.

Novel Behavioral Health Programs

Embedded behavioral health. In 2009 and 2010, the Army piloted embedded behavioral health, a mental health care delivery model, at Ft. Carson in an effort to decrease stigma, reduce barriers, and enhance care coordination. Leveraging lessons from in-theater embedded medical and mental health care (8, 9) (including the long history of embedded surgeons and primary care professionals), this program created small, multidisciplinary satellite mental health clinical teams assigned to combat-deployable units at their home locations and co-located the teams proximal to where soldiers worked. A 2010–2011 program evaluation by the U.S. Army Public Health Command identified significant correlations between implementation of the embedded teams and reductions in off-post mental health referrals, inpatient hospitalizations, and soldier risk behaviors, as well as an increased proportion of soldiers considered psychiatrically fit for deployment (36). These findings were attributed to improved access and continuity of care and enhanced communication between mental

health providers, primary care, and unit leaders. The findings were also consistent with a quasi-experimental study that demonstrated the effectiveness of care coordination between garrison and deployed settings (25) and an evaluation by a health care systems team from Massachusetts Institute of Technology. As a result, additional pilot efforts were initiated, and in January 2012, the Vice Chief of Staff of the Army directed expansion of embedded behavioral health teams to all installations where deployable combat brigades reside. Currently 54 functional teams are in place, each supporting a brigade-size unit, at 18 installations.

Behavioral health in primary care. Another key initiative to reduce stigma and enhance access, first introduced in 2006 at Ft. Bragg and subsequently expanded Army-wide, was a pilot project called Re-Engineering Systems of Primary Care for PTSD and Depression in the Military, based on collaborative care models tested originally in civilian populations (37). This pilot involved screening for depression, PTSD, and alcohol misuse in primary care, telephone consultation with mental health professionals, and care management. Beginning in 2011, the program transitioned to a structure that involved licensed mental health professionals embedded directly within primary care clinics. Currently, nearly 100 mental health professionals working in 48 primary care clinics Army-wide are providing consultation to primary care providers, clinical assessments, triage, and brief cognitive-behavioral interventions. A large randomized trial conducted at six installations is assessing the effectiveness of additional care management enhancements, stepped treatment (including web and telephone options), and more intensive outcome management compared with usual care (38).

Child and family behavioral health system. While the volume of research was growing on the impact of the wars on soldiers, studies also documented the impact on military children and spouses (39, 40). In response, family services were expanded through a program that includes consultation to primary care, outreach, screening, treatment for family members, and mental health services delivered directly in primary and secondary schools located on military installations. Currently, mental health professionals are working directly in 45 schools on Army posts.

Behavioral Health Data Portal. With the growth in number of providers with varying levels of training and experience, the ability to systematically monitor practice outcomes and treatment effectiveness was needed. Beginning in 2012, after several years of pilot efforts, the Army deployed a web-based application named the Behavioral Health Data Portal across Army mental health clinics. This system collects standardized patient self-assessments on initial entry into mental health care and at every follow-up visit via electronic notebooks or tablets accessed by patients at clinic check-in. Currently, over 70% of outpatient mental health appointments for soldiers Army-wide are associated with standardized clinical outcome measures. These include Patient Health Questionnaire depression measures, generalized anxiety measures, the Primary Care PTSD screen, the PTSD Checklist, the Alcohol Use Disorders Identification Test, and a brief version of the Columbia–Suicide Severity Rating Scale. The data portal also incorporates a new functional impairment measure developed by Army researchers for working populations (41). The portal enables mental health providers to view clinical outcome data and trends real-time during each appointment, assess treatment effectiveness, and give immediate feedback to patients. The system also links with Army occupational data that track deployment readiness, including postdeployment health assessments, and it includes an algorithm to assist with coordination of care for soldiers transferring to other posts. Aggregate data are available across treatment facilities and regions, allowing linkage with electronic medical records for routine surveillance and program evaluation efforts. The data portal was recently mandated by the Assistant Secretary of Defense for Health Affairs for expansion to the Air Force and the Navy.

Additional Core Program Components

Screening initiatives across a soldier's career. In addition to routine screening for common mental disorders (depression, PTSD, substance use disorders) in primary care, further modifications to the mandatory DOD deployment screening have occurred as a direct result of emerging Army research and Congressional mandates. In 2011, a two-stage screening process for PTSD and depression was introduced because of concerns about predictive validity (21), and the screening questions for mild TBI used on the deployment surveys (which were also used in the 2008 RAND prevalence study [30]) were extensively revised based on evidence that they were invalid for clinical screening purposes (3, 31, 32, 42).

Health care policies to facilitate standards of care. Army health care policies attempted to balance organizational needs for standardization based on existing best practices and clinical guidelines (33) with expected variation in providers' interpersonal styles, patient preferences, and standards of care, as well as evidence that lack of therapeutic efficacy was most often due to dropout from treatment. Research informed these policies, including studies of stigma and reasons for treatment dropout (43) and a survey of Army mental health professionals that showed high training and use of evidence-based treatments but low fidelity to all core manualized techniques (44). These results were used to develop a PTSD treatment policy that fostered a modular approach emphasizing patient and provider choice in selecting treatment options (to enhance retention) while also requiring clinicians to document how they provided the core components of evidence-based interventions intrinsic across different manualized protocols (45). This is more flexible than the VA policy approach, which emphasizes strict provider adherence to two manualized therapies (cognitive processing and prolonged exposure). In addition, an Army study directly comparing

TABLE 2. Outpatient and Inpatient Mental Health Care Encounters Involving Active-Duty Army Soldiers, 2010–2014[a]

	2010		2011		2012		2013		2014	
Measure	N	%	N	%	N	%	N	%	N	%
Total population	571,379		579,938		568,102		549,515		530,552	
Receiving outpatient mental health care (direct care)	193,494	33.9	223,385	38.5	198,257	34.9	174,785	31.8	157,854	29.7
Receiving outpatient mental health care (direct and purchased care)	198,656	34.8	229,052	39.5	205,110	36.1	182,489	33.2	164,203	30.9
Outpatient mental health encounters (direct care)	1,100,183		1,126,708		1,083,312		1,049,715		1,029,137	
Outpatient mental health encounters (direct and purchased care)	1,244,285		1,305,192		1,348,766		1,277,517		1,222,988	
Inpatient mental health admissions (direct care)	4,243		4,836		4,816		4,599		4,769	
Inpatient mental health admissions (direct and purchased care)	10,857		12,298		12,558		10,646		9,655	
Inpatient bed days (direct care)	29,328		33,920		37,546		38,136		39,569	
Inpatient bed days (direct and purchased care)[b]	128,186		144,539		162,629		135,093		114,774	
Outpatient mental health encounter within 7 days of hospital discharge (%)[c]		NA		NA		92		92		95
Outpatient mental health encounter within 30 days of hospital discharge (%)[c]		NA		NA		97		97		98

[a] Direct care includes all care provided at military treatment facilities; purchased care includes care provided by civilian providers in the community through TRICARE insurance.
[b] The average inpatient lengths of stay for the years 2010–2014 ranged from 11.66 to 12.92 days.
[c] Health Plan Employer Data and Information Set (HEDIS) measures. NA=not available.

PTSD diagnostic criteria provided clinicians with military-specific guidance on applying definitional changes in DSM-5 (45, 46).

Revision of disability evaluations. Although disability evaluations are not managed under the Behavioral Health Service Line, Army mental health providers routinely conduct evaluations that contribute to determinations of soldiers' fitness for duty and disability. In late 2011, problems with the disability evaluation system came to light after allegations from 14 soldiers that their PTSD diagnoses had been changed by Army mental health evaluators at Ft. Lewis, Wash., leading to reduction or denial of benefits (47). As a result, the Army conducted an investigation of all disability evaluations since 2001 and offered reevaluations to more than 400 soldiers who had potential adverse changes to their PTSD diagnosis. Of 257 who elected to participate in the re-evaluation, the diagnosis of PTSD was upheld in over half (47). The Army evaluation paralleled a DOD-level review that ultimately led to major revisions in policies and procedures, including integration of DOD and VA disability evaluation processes and establishing the VA evaluation as the evaluation of record (greatly reducing administrative burdens of parallel systems).

PROGRAM EVALUATION

Given that the Behavioral Health Service Line is relatively new and being implemented simultaneous to the drawdown of forces in Afghanistan, it is difficult to prove that the revised structure of care has been solely or directly responsible for improved outcomes. However, the transformation was clearly necessary, and certain programmatic outcomes suggest benefits. Table 2 lists total outpatient and inpatient behavioral health care encounters, inpatient bed days, and the percentages of soldiers who received a follow-up appointment within 7 and 30 days after discharge from an inpatient mental health hospitalization from 2010 to 2014. While the active-duty population has decreased by approximately 8% since its peak in 2011, and ambulatory behavioral health encounters have decreased by a similar proportion, total psychiatric hospitalizations and bed days have fallen more than 20% through reductions in purchased services. The proportion of soldiers who received an outpatient appointment within 7 days after inpatient discharge rose from 92% to 95% between 2012 and 2014, far exceeding benchmarks in civilian systems of care.

A recent study of trends in stigma perceptions over the course of these wars documented significant improvements in stigma as well as traditional access barriers (e.g., appointment availability) (48). These improvements, which started before implementation of the Army-wide transformation of care, are probably related to a number of factors, including routine primary care and deployment-related screening, education campaigns by senior leaders, research efforts, and media attention.

CHALLENGES AND CRITICAL GAPS

Although mental health efforts for service members have been unprecedented compared with those made during past

conflicts, many challenges remain, including continued underutilization of mental health services (43), problems with treatment of substance use disorders (49), concerns with chronic pain and prescription opioid misuse (50), and lack of clarity on optimal strategies to address overlapping postdeployment physical and cognitive symptoms being attributed (or likely misattributed) to concussion (3, 4, 31, 32, 42, 51). Studies in both the DOD and the VA show that despite improvements in screening and stigma perceptions, a large percentage of service members and veterans still do not seek mental health care when needed or do not receive an adequate number of treatment encounters for recovery (43). Emerging research indicates that the reasons for this gap appear to be much more complex than initial studies suggested. In particular, not seeking or dropping out of treatment are more strongly associated with preferences for self-sufficiency and negative perceptions of mental health treatment than traditional conceptualizations of stigma or barriers identified at the beginning of the wars (43, 52, 53).

A considerable portion of the PTSD and TBI research investment over the past 8 years has been directed toward establishing the infrastructure to support large consortiums and multicenter trials (in addition to the infrastructure for the DOD Center of Excellence for Psychological Health and TBI). However, the science has not necessarily evolved to the point of prioritizing multicenter trials (54), and the investment structure may have dampened innovative initiatives from individual investigators or smaller organizations. Excellence is also not established solely through an organization's name or structure. A large proportion of funding for PTSD clinical trials has been directed toward refining, improving, or validating existing evidence-based treatments in military populations, particularly prolonged exposure and cognitive processing therapy, despite high dropout rates among veterans receiving these treatments (54). In contrast, research is lacking on veteran preferences for care. There has not been a single clinical trial of eye-movement desensitization and reprocessing therapy or narrative exposure therapy, two well-established evidence-based PTSD treatments used throughout the world (33, 54), in veterans of the Iraq and Afghanistan wars. Promising emerging approaches that have a strong scientific rationale, such as accelerated resolution therapy (a variant of eye-movement desensitization and reprocessing that preliminary evidence suggests may result in faster recovery with a lower dropout rate [55]), have received little attention. Despite massive research investment and highly specialized interdisciplinary TBI programs (e.g., the National Intrepid Center of Excellence), non-evidence-based treatments for persistent TBI-attributed symptoms predominate, and clinical research on TBI is plagued by definitional problems and poor selection of control groups (4, 31, 56). No new treatment for blast- or impact-related postconcussion symptoms has been identified, and we are not aware of a single clinical trial in a military or veteran population to validate or refine treatment known to be most effective in preventing chronic postconcussion symptoms in civilian populations (i.e., education to promote expectations of recovery) (34). Critical research priorities include the validation of interventions to improve treatment engagement and retention, further testing of innovative treatments, and collaborative primary care strategies (4, 51, 54).

Clinical trials of primary care-based models of treatment for postdeployment health concerns are likely the only path to optimizing postconcussion care, a lesson forgotten from the first Gulf war. Problems such as opioid overprescribing, polypharmacy, and probable misattribution of postdeployment symptoms to concussion stem largely from the specialty-driven structure of care, which is not optimal for generalized chronic health problems (3, 4, 31, 34, 38, 42, 50, 51). Although changes are occurring, including transformation of DOD primary care clinics into patient-centered medical homes and greater acceptance of complementary and alternative medicine approaches, we are aware of only one trial of a collaborative stepped-care model in primary care (38). Another critical gap involves treatment of substance use disorders, which in the military has been handled as a nonmedical program with oversight by unit commanders. This program has been excluded from federal privacy protections, linked with occupational drug testing, and not managed under the medical system. This structure inhibits self-reporting of substance use disorders by soldiers who do not want their commanders to be aware of their problems, and results in treatment services that have been documented to lag well behind civilian standards (49).

Another challenge concerns the dispersed nature of health services for family members as well as reserve component soldiers. Family members have borne the burden of long separations, fear for the safety of deployed loved ones, tragic losses, or caregiver fatigue. While many programs have been established to address family needs, the reality is that families experience added barriers, and less research has been conducted on the impact of these wars on families. Most family member care is delivered through a network of off-post civilian providers willing to accept government insurance, and it is less accessible than the direct care system. Reserve component soldiers also face unique challenges, and there is evidence that their rates of health concerns (both physical and mental) are higher following deployment than for active component soldiers (7, 19).

In addition to these challenges, these war years have generated important unanswered questions that have implications for projecting future health care needs. First is a lack of clarity on precisely why suicide rates rose so markedly in Army and Marine Corps personnel but not in Air Force and Navy personnel between 2006 and 2012, followed by a significant downturn starting in 2013. Researchers have debated potential causes, most critically whether or not combat deployments had direct associations (13–15, 57). Suicide rates rose as sharply in nondeployers as in deployers, and the most plausible explanation seems to be the unmitigated cumulative operational strain of repeated training and deployment cycles affecting all ground force personnel and a parallel rise in the

TABLE 3. Addressing Gaps in Mental Health Efforts for Service Members and Planning for Future Conflicts

Category	Considerations and Recommendations
Ensure optimal clinical research infrastructure	Sustain research funding for military-related mental health concerns Ensure that research is incorporated into operational planning Establish equitable processes for research grant applications that focus as much on novel treatments/interventions as on established approaches Foster grant applications from individual investigators. Establish research consortiums only when multicenter trials are clearly indicated
Prioritize randomized clinical trials to ensure that they meet the highest priority needs	Establish clear priorities that address most critical clinical gaps focused both on the deployment mission and postdeployment care Current top priorities include: Interventions to improve treatment engagement and retention Primary care interventions for postdeployment health conditions Novel treatment approaches for PTSD and other mental health concerns
Educate mental health providers	Incorporate lessons learned from recent wars into graduate medical education programs Maintain experienced military providers and educators who can ensure retention and evolution of knowledge Ensure that mental health clinicians are trained in and gain direct experience in recognizing the immediate and long-term consequences of war and are skilled in providing evidence-based treatment
Evolve medical practice in-theater and in garrison	Ensure that clinical practice guidelines and military doctrine and training incorporate lessons from recent wars Enhance ability to detect and understand long-term impact of mental disorders to refine screening, deployability criteria, and treatment Ensure that screening efforts are partnered with care coordination Ensure optimal structure of clinical services, both in-theater and postdeployment, and continually re-evaluate the structure of care Ensure continued synchronization and coordination of mental health care Optimize care for generalized health concerns (e.g., collaborative primary care interventions that address persistent postconcussion and/or postdeployment symptoms, chronic pain, and polypharmacy) Ensure availability of evidence-based treatments for substance use disorders, with confidentiality equivalent to that for other mental disorders Sustain routine collection of clinically meaningful outcome measures
Address larger population needs	Address unique needs of reserve component members and ensure that they have services equivalent to those of active component members Ensure that the needs of families are fully addressed
Validate prevention initiatives	Validate mental health prevention and/or resilience training prior to large-scale rollout Build program evaluation into new programs and ensure that evaluations have sufficient scientific rigor

prevalence of underlying mental disorders over many war years (14, 57).

Another important question concerns the efficacy and cost-effectiveness of reintegration, mental health prevention, and resiliency training initiatives that the DOD made considerable investments in. A prime example is the Army's Comprehensive Soldier and Family Fitness initiative and its associated resilience training, designed to reach all soldiers, not just those experiencing psychological problems or seeking care. Although criticized as not having adequate evidence (58), this universal program was built on three components: the Penn Resiliency Program (one of the most researched resilience initiatives in civilian populations) (59), the Walter Reed Army Institute of Research Battlemind program (the only postdeployment training subjected to randomized trials) (60, 61), and performance psychology research. The Army made a landmark investment in unit-level randomized trials to validate deployment and resilience educational interventions (60–64). These trials have demonstrated some efficacy of the original postdeployment Battlemind training (60, 61), as well as performance psychology components applied in a basic training environment (62), and other resilience components not routinely provided to soldiers (63). Overall, however, the randomized trial evidence shows, at best, small effect sizes (60–64), and reports of effectiveness of the Comprehensive Soldier and Family Fitness program as a whole are based on program evaluations comparing units that do not appear to be equivalent in type or operational deployment experiences (65, 66).

SUMMARY

The U.S. Army has made a tremendous investment in research, transformed mental health services for soldiers and families, and paved the way for DOD- and VA-wide efforts. Given the size of the Army, the cumulative strain of 14 years of war, continuing global threats, and persistent challenges with underutilization of care, it is anticipated that the increased

need for mental health services will continue for years to come. Among the most important distinctions between the current and previous wars are the degree to which research has guided programmatic changes and the willingness to study these challenges to optimize clinical and public health care strategies. Media coverage and congressional inquiries have added to the attention on war-related mental health problems. The Army Medical Command's recognition of the complexity of mental health problems, combined with increased resources and continuous research investment to inform policies and practices, has supported the transformation to a more responsive, standardized, and evidence-based structuring of mental health care, offering promise for improved outcomes for soldiers and families. However, many challenges remain, and it will be critical to ensure that persisting gaps are addressed and knowledge gained during the current wars is retained and further evolved. Table 3 summarizes considerations and recommendations for addressing ongoing gaps and planning for future conflicts.

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