

## RE-AIM evaluation of the Veterans Health Administration's MOVE! Weight Management Program

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### ABSTRACT

Over one-third of patients treated in the Veterans Health Administration (VHA) are obese. VHA introduced the MOVE! Weight Management Program for Veterans in 2006 to provide comprehensive weight management services. An evolving, periodic evaluation using the RE-AIM framework (reach, effectiveness, adoption, implementation, and maintenance) has been conducted to gauge success and opportunities for improvement. Key metrics were identified in each RE-AIM dimension. Data were compiled over fiscal years (FY) 2006 through 2010 from a variety of sources including VHA administrative and clinical databases, electronic medical record reviews, and an annual, structured VHA facility self-report. **REACH:** Screening for obesity and offering weight management treatment to eligible patients increased from 66% to 95% over the past 3 years. MOVE! is currently provided at every VHA hospital facility and at over one-half of VHA community-based outpatient clinics. The percent of eligible patients who participate in at least one weight management visit has doubled since implementation began but has stabilized at 10 to 12%. **EFFECTIVENESS:** About 18.6% of the 31,854 patients with available weight data who participated in at least two treatment visits between Jul 1, 2008 and Sep 30, 2009 had at least a 5% body weight loss by 6 months as did almost one-third of those who participated in more intense and sustained treatment. By contrast, only 12.5% of a comparison group of patients matched on age, gender, body mass index (BMI) class, and comorbidity status who were not treated with MOVE! had at least a 5% body weight loss. **ADOPTION:** The median full-time staff equivalent providing weight management services at each facility has increased over time and was 1.76 in FY 2010. **IMPLEMENTATION:** Staff from multiple disciplines typically provide MOVE!-related care although not all disciplines are involved with providing care at every facility. Group-based treatment has become increasingly utilized, and in FY 2010 it represented 72% of all MOVE!-related visits. Intensity of treatment has increased from an average of 3.6 visits per patient per year in FY 2007 to 4.6 in FY 2010, but more than half of patients have two visits or less. Almost all facilities now report the consistent use of key evidence-based behavioral strategies with patients. **MAINTENANCE:** While participation in MOVE! by patients continues to grow each year, facility self-

### Implications

**Practice:** Weight management treatment can be delivered at VHA medical centers and community-based outpatient clinics with modest but positive impact on short-term weight loss outcomes. Intensity and span of treatment are key drivers of clinical success.

**Policy:** Policies for weight management within integrated health systems should include both clinical and administrative components to ensure an infrastructure upon which evidence-based weight management can be provided.

**Research:** Increasing reach, improving effectiveness of care, and keeping patients engaged in treatment through new modalities of care and better linkage with primary care teams are areas for future research.

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reported program staffing and space/equipment challenges are potential barriers to long-term program maintenance. Evidence-based weight management treatment can be delivered at VHA medical centers and community-based outpatient clinics, but the reach remains limited after several years of implementation. Intense and sustained treatment with MOVE! results in a modest positive impact on short-term weight loss outcomes, but a relatively small proportion of patients engage in this level of care. Increasing reach, improving effectiveness of care, and keeping patients engaged in treatment are areas for future policy, practice, and research.

### KEYWORDS

Obesity, Overweight, Weight management, Weight loss, Weight reduction, Body weight changes, Veterans, Veterans health, Program evaluation, Program effectiveness

## INTRODUCTION

Studies over the last 10 years estimate that between 25% and 35% of the patients served by the Veterans Health Administration (VHA) are obese (body mass index (BMI)  $\geq 30$ ) [1–5]. VHA operational data for patients who received care from VHA during fiscal year (FY) 2010 suggest that 39.3% of patients treated in the VHA are obese and another 37.6% are overweight ( $25 < \text{BMI} < 30$ ). In 2006 VHA introduced the MOVE! Weight Management Program for Veterans (MOVE!) to provide comprehensive weight management services for the nearly 6 million veterans served throughout its system of approximately 153 hospitals and 956 outpatient clinics [6, 7].

The design and dissemination of MOVE! has been previously described [7]. Briefly, MOVE! was designed in response to VHA clinician requests for a comprehensive, evidence-based approach for dealing with the increasing obesity problem they were seeing among their patients. It was pilot tested during FY 2002 to FY 2004 at 17 VHA sites and was nationally implemented in FY 2006 through policy requiring system-wide screening for obesity and offering of comprehensive treatment to eligible veterans [8]. The approach used by MOVE! is based on the NIH Identification of Overweight and Obesity in Adults Evidence Report [9], recommendations of the US Preventive Services Task Force [10, 11], and the joint Department of Veterans Affairs/Department of Defense Clinical Practice Guideline for Screening and Management of Overweight and Obesity [12] and is supplemented by other literature (e.g., Diabetes Prevention Program) [13]. The core components of MOVE! include a tailored intake based on patient completion of the MOVE!23 Questionnaire (<http://www.move.va.gov/move23.asp>) and behaviorally-based diet and physical activity self-management support delivered through a variety of modalities including individual and group face-to-face counseling and telephone. Weight loss medications, intensive outpatient treatment, including residential treatment, and bariatric surgery may also be available as adjuncts to the core behavioral program.

An evolving, periodic clinical program evaluation organized within the RE-AIM framework (reach, effectiveness, adoption, implementation, and maintenance) has been conducted to gauge success and opportunities for improvement within MOVE! [14]. This framework was chosen because of its ability to evaluate the impact of health behavior interventions at the individual and institutional level across multiple domains, including domains other than just efficacy similar to the realist evaluation approach proposed by Pawson et al. [15]. This paper describes key findings from the evolving program evaluation and discusses the opportunities and challenges for high-quality translation of weight management research into clinical practice within large integrated healthcare systems.

## METHODS

### Sample

The 140 administratively accountable VHA medical centers or healthcare systems, which have more than one hospital, comprised the “facility” unit of evaluation. A facility includes the main VHA hospital plus any affiliated satellite hospitals and community-based outpatient clinics. As this evaluation was conducted as part of national program monitoring and oversight and not for research purposes, all VHA facilities were included. For the purpose of preparing this manuscript, several additional analyses were conducted beyond programmatic needs, and these were approved by the Durham VAMC Institutional Review Board, which has research oversight responsibility for the National VHA Program Office charged with developing, implementing, and monitoring MOVE!.

### Measure development and data sources

Measures specific to MOVE! were developed in each of the five RE-AIM dimensions as defined in Table 1 and were constructed primarily as measures for improvement and decision-making, rather than as measures for accountability or research [16]. Measure development included an internal scan of existing VHA metrics and data sources and an external scan of private and/or public sector metrics in the area of obesity and weight management. We sought a balanced portfolio of measures that included both basic and computed measures, intrinsic and relative measures, and objective and subjective measures with consideration to the use of existing data wherever possible to maximize limited program resources. Further, an evolving portfolio of measures was anticipated with the early years focusing more on subjective measures of facility-level adoption and implementation, while more recent years have focused on objective measures of reach and effectiveness.

Data used to calculate measures are compiled from a variety of sources including administrative databases (VHA National Patient Care Databases hosted at the Department of Veterans Affairs (VA)'s Austin Information Technology Center), vital sign data electronically extracted from VHA's electronic medical record (VA Corporate Data Warehouse), data collected during manual medical record review performed as part of VHA's ongoing External Peer Review Program (EPRP) for monitoring quality of care, and an annual, structured report completed by each facility. This facility report is required and is usually completed by the MOVE! facility coordinator with concurrence on responses provided by the facility director and the regional network director. Some measures require the use of deidentified patient data, whereas other measures use data collected at the level of the administratively accountable VHA facility. Some measures are reported by facility complexity category, which is determined

**Table 1** | Definitions of RE-AIM dimensions with exemplar measures used in the VHA MOVE! Weight Management Program evaluation (definitions adapted from [www.re-aim.org](http://www.re-aim.org))

RE-AIM dimension and definition	Exemplar measures <sup>a</sup>	Data source
<b>Reach</b>		
The absolute number, proportion, and representativeness of individuals who are willing to participate in a given initiative, intervention, or program	<ul style="list-style-type: none"> <li>• % of outpatients seen who are screened for obesity using BMI</li> <li>• % of overweight and obese patients who participate in one or more sessions</li> </ul>	<ul style="list-style-type: none"> <li>• VHA External Peer Review Program</li> </ul>
<b>Efficacy/Effectiveness</b>		
The impact of an intervention on important outcomes, including potential negative effects, quality of life, and economic outcomes	<ul style="list-style-type: none"> <li>• % of patients losing 5% or more body weight 6 months after first session</li> <li>• Mean percent body weight change 6 months after first session</li> </ul>	<ul style="list-style-type: none"> <li>• VA Corporate Data Warehouse (vital signs) and VHA National Patient Care Databases (encounters)</li> </ul>
<b>Adoption</b>		
The absolute number, proportion, and representativeness of settings and intervention agents (people who deliver the program) who are willing to initiate a program	<ul style="list-style-type: none"> <li>• % of VA facilities with a MOVE! coordinator and a physician champion</li> <li>• Number of FTEE providing MOVE!-related patient care</li> </ul>	<ul style="list-style-type: none"> <li>• VHA MOVE! Annual Facility Report</li> </ul>
<b>Implementation</b>		
At the setting level, implementation refers to the intervention agents' fidelity to the various elements of an intervention's protocol, including consistency of delivery as intended and the time and cost of the intervention. At the individual level, implementation refers to clients' use of the intervention strategies	<ul style="list-style-type: none"> <li>• Use of a multidisciplinary team to provide patient care</li> <li>• Number of visits per patient seen in MOVE (i.e., facility visit intensity)</li> <li>• Use of evidence-based behavioral strategies</li> </ul>	<ul style="list-style-type: none"> <li>• VHA MOVE! Annual Facility Report</li> <li>• VHA National Patient Care Databases</li> <li>• VHA MOVE! Annual Facility Report</li> </ul>
<b>Maintenance</b>		
• The extent to which a program or policy becomes institutionalized or part of the routine organizational practices and policies. Within the RE-AIM framework, maintenance can also apply at the individual level	<ul style="list-style-type: none"> <li>• Sufficiency of numbers and types of staff to provide MOVE! care</li> <li>• Sufficiency of space and equipment for providing MOVE! Care</li> </ul>	<ul style="list-style-type: none"> <li>• VHA MOVE! Annual Facility Report</li> </ul>

FTEE full-time employee equivalent

<sup>a</sup> All measures are calculated at the VHA Facility level though some may use patient-level data to derive a facility estimate. Measures in the reach dimension are weighted based on facility size and numbers sampled and then aggregated to the regional and national level

using an algorithm most recently updated in 2008 by the VHA National Leadership Board that categorizes each facility based on the patient population seen, clinical services complexity (including ICU levels and count of complex clinical programs), and presence and size of the graduate medical education and research enterprise.

### Analysis

Descriptive statistics (frequencies, percentages, means, and medians) are employed to calculate measures for data collected at the level of the facility (e.g., measures within the adoption, implementation, and maintenance), and these data are then aggregated to provide regional and national estimates for each fiscal year reported (e.g., FY 2007, 2008, 2009, 2010). Facility-level measures

within the reach dimension are calculated using unweighted EPRP data collected at the patient level within a facility each month, then weighted in proportion to the facility size and number of patients sampled from the facility and aggregated to provide regional and national estimates each quarter and year. Facility-level measures within the effectiveness dimension require a more complex analysis because they involve calculation of a patient-level outcome that is longitudinal in nature and because outcomes on untreated patients are calculated for relative comparison. All effectiveness measures presented here use a subset of 31,854 patients first treated with MOVE! between July 1, 2008 and September 30, 2009 and 71,725 untreated patients matched on facility, age, gender, BMI class, and comorbidity status using diagnostic cost group risk

score, which is a comorbidity measure predictive of a veteran's 1-year mortality [17, 18]. Further details for the effectiveness measure estimates are available in the “[Electronic supplementary material](#)”.

## RESULTS

### Reach

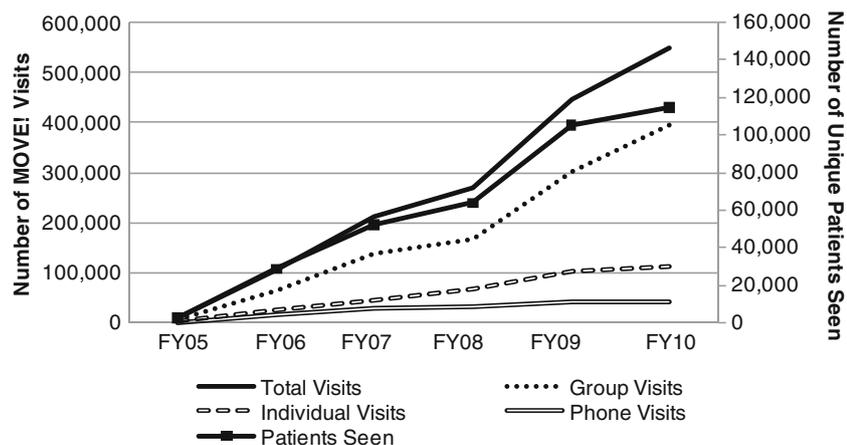
Annual screening for obesity and offering weight management treatment to eligible patients has increased from 66% to 95% between FY 2008 and FY 2010. MOVE! is currently provided at every VHA hospital facility and at over one-half of VHA community-based outpatient clinics. The percent of eligible patients who participate in at least one weight management visit has doubled since implementation began but has stabilized at 10% to 12%. The prevalence of patient participation does not vary by size or complexity of VHA facility, but there is moderate interfacility variation (interquartile range (IQR) 6). Approximately two-thirds of the 114,541 patients seen with MOVE! in FY 2010 were patients seeking MOVE! treatment for the first time; the remaining third represent patients who began receiving treatment in prior years. The annual number of unique patients seen with MOVE! and the number of group, individual, phone, and total MOVE! visits continues to increase each year (see Fig. 1).

### Effectiveness

Effectiveness measures have been calculated on a subset of all MOVE!-treated patients first seen between July 1, 2008 and September 30, 2009. Full subset selection and analysis details are available in the “[Electronic supplementary material](#)”. To summarize, of the 118,167 patients seen with MOVE! during this period, 50,911 were excluded because of having only one visit, which is sometimes an orientation session not a treatment visit, and

16,497 were excluded because of having a first visit before July 1, 2008. Further, 2,270 were excluded due to visits at facilities with very low volume of patients seen with MOVE! (<30 patients seen during time period). Additional patients were excluded due to various reasons including lack of available baseline weight ( $n=3,582$ ) or follow-up weight data ( $n=9,793$ ), inability to match to a comparison patient ( $n=1,599$ ), or for other various reasons detailed in the “[Electronic supplementary material](#)” ( $n=1,661$ ). This left a MOVE!-treated subset of 31,854 that was matched at a ratio of up to three to one against a sample of 71,725 comparison patients assembled from a cohort of 3,798,530 patients seen in VHA with BMI>25 during the time period under evaluation. The matching characteristics included gender, age category, BMI class, and comorbidity status based on patient FY 2008 diagnostic cost group risk. Baseline characteristics of the MOVE! subset and the comparison sample were similar and are provided in Table 2. The mean age of the MOVE! subset was 57.6 (standard deviation 10.4) years, and 89.9% were male. Thirty-five percent had addresses of record classified as rural or highly rural according to the VHA scheme for classifying rural/urban status [19]. Approximately 45% had a diagnosis of diabetes, and 72% had a diagnosis of hypertension. The percent of MOVE! patients who received intense but not sustained treatment (defined as 8 or more visits in 6 months) and sustained but not intense treatment (defined as treatment spanning 4 months or longer) was 12.1% and 11.6% respectively, and the percent receiving both intense and sustained treatment was 13.4%. The remainder of MOVE! treated patients (62.9%) received neither intense nor sustained treatment. More information about how definitions for intense and sustained treatment were derived is available in the “[Electronic supplementary material](#)”.

The mean weight and BMI change, mean percent body weight change, and weight change categories



**Fig 1 |** The number of unique patients seen and the number of group, individual, phone, and total visits provided between FY 2005 and FY 2010 by the VHA MOVE! Weight Management Program for Veterans

**Table 2** | Baseline characteristics of the subset of MOVE!-treated patients and comparison patients used for measures within the *effectiveness* dimension

Characteristic	MOVE patients		Comparison sample	
	n=31,854	Mean (SD) or %	n=71,725	Mean (SD) or %
Age (years)		57.6 (10.4)		58.1(10.3)
% ≤49	6,143	19.3	12,699	17.7
% 50–59	9,676	30.4	22,246	31.0
% 60–69	13,520	42.4	31,465	43.9
% ≥70	2,515	7.9	5,315	7.4
% Men	28,644	89.9	64,961	90.6
% Highly rural	360	1.1	1,183	1.7
% Rural	10,951	34.5	26,673	37.3
% Urban	20,444	64.4	43,656	61.1
% With diabetes	14,171	44.5	33,864	47.2
% With hypertension	22,904	71.9	51,828	72.3
% With hypercholesterolemia	7,171	22.5	15,344	21.4
% Overweight (25.0–29.9)	4,776	15.0	10,584	14.8
% Obese class I (30.0–34.9)	11,299	35.5	25,447	35.5
% Obese class II (35.0–40.0)	8,690	27.3	19,773	27.6
% Obese class III (over 40.0)	7,089	22.3	15,921	22.2
% DCG category 1 (0.008–<0.09)	3,163	9.9	6,559	9.1
% DCG category 2 (0.09–<0.37)	11,817	37.1	24,752	34.5
% DCG category 3 (0.37–<1.07)	8,540	26.8	20,007	27.9
% DCG category 4 (1.07–<1.86)	5,053	15.9	12,233	17.1
% DCG category 5 (≥1.86)	3,281	10.3	8,174	11.4
% Facility complexity level <sup>a</sup> 1a	8,800	27.6	20,441	28.5
% Facility complexity level 1b	3,687	11.6	8,296	11.6
% Facility complexity level 1c	2,923	9.2	6,621	9.2
% Facility complexity level 2	4,662	14.6	10,499	14.6
% Facility complexity level 3	3,626	11.4	8,093	11.3
% CBOC small	303	1.0	616	0.9
% CBOC medium	2,225	7.0	4,836	6.7
% CBOC large	2,868	9.0	6,204	8.7
% CBOC very large	2,689	8.4	5,957	8.3
% Other	71	0.2	162	0.2

SD standard deviation, DCG diagnostic cost group risk adjuster, a measure of healthcare utilization and a proxy for comorbidity status, CBOC community-based outpatient clinic

<sup>a</sup> Per the VHA's 2008 Facility Complexity Level Model (1A is most complex, 3 is least complex)

for MOVE!-treated patients overall, MOVE! patients treated with intense and sustained treatment, and untreated comparison patients stratified by gender are depicted in Table 3 and Fig. 2. Overall, 18.6% of patients who participated in at least two treatment visits achieved at least a 5% body weight (i.e., clinically relevant) loss by 6 months. By contrast, only 12.5% of a comparison group of untreated patients had a clinically relevant weight loss by 6 months. Of the patients who received intense and sustained treatment, 31.6% achieved a clinically relevant weight loss. Considerable interfacility variation in 6-month weight loss outcomes exists; the facility median for the percent of patients achieving a clinically relevant amount of weight loss was 18.0% (IQR 7.9). Twenty facilities of the 286 facilities included in this analysis achieved a clinically relevant amount of weight loss in 30% or more of their treated population, while 20 facilities achieved a clinically relevant amount of weight loss

in less than 10%. Facility size and complexity were not significantly related to a facility's outcomes.

#### Adoption

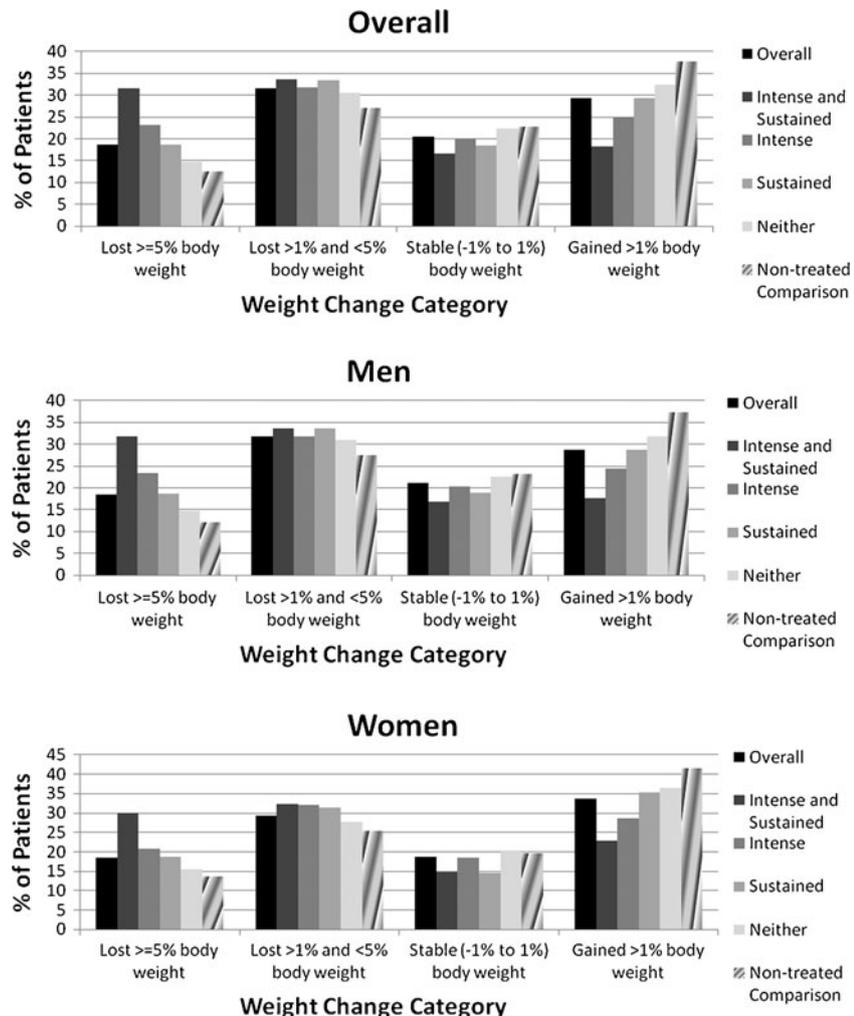
MOVE! leadership, as evidenced by the presence of a MOVE! facility coordinator and a MOVE! physician champion, is established in nearly every VHA medical center or healthcare system. The facility department to which the MOVE! belongs varies by facility, but about half are organizationally placed within the Nutrition and Food Service line and nearly one-third are placed within the Primary Care Service line. The median full-time staff equivalent (FTEE) per facility providing weight management services has increased over time, with a median of 1.76 in FY 2010; however, there is significant interfacility variation with estimates ranging from 0.30 to 9.4. Higher estimates are generally reported from facilities with active bariatric surgery programs. As expected, larger

**Table 3** | Weight loss outcomes at 6 months overall and by gender for a subset of patients treated with the MOVE! Weight Management Program for Veterans compared to a sample of comparison patients matched on age, gender, BMI class, and comorbidity status

Six-month outcome	MOVE!-treated patients	Intense/sustained <sup>a</sup> MOVE!-treated patients	Comparison patients
Overall	<i>n</i> =31,854	<i>n</i> =4,282	<i>n</i> =71,725
Mean weight change (lbs)	-3.6 (95% CI -3.9, -3.3)	-8.2 (95% CI -8.9, -7.5)	-1.0 (95% CI -1.1, -0.9)
Mean % body weight change	-1.50 (95% CI -1.5%, -1.3%)	-3.20 (95% CI -3.5%, -2.9%)	-0.40 (95% CI -0.4%, -0.4%) <sup>b</sup>
Mean BMI change (kg/m <sup>2</sup> )	-0.5 (95% CI -0.5, -0.5) <sup>b</sup>	-1.2 (95% CI -1.3, -1.1)	-0.2 (95% CI -0.2, -0.2) <sup>b</sup>
Women	<i>n</i> =3,210	<i>n</i> =427	<i>n</i> =6,764
Mean weight change (lbs)	-2.1 (95% CI -2.6, -1.6)	-6.0 (95% CI -7.5, -4.6)	-0.4 (95% CI -0.7, -0.0)
Mean % body weight change	-0.9 (95% CI -1.2%, -0.7%)	-2.8 (95% CI -3.5%, -2.1%)	-0.1 (95% CI -0.3%, -0.1%)
Mean BMI change (kg/m <sup>2</sup> )	-0.4 (95% CI -0.4, -0.3)	-1.0 (95% CI -1.2, -0.8)	-0.1 (95% CI -0.1, -0.0)
Men	<i>n</i> =28,644	<i>n</i> =3,855	<i>n</i> =64,961
Mean weight change (lbs)	-3.8 (95% CI -4.0, -3.4)	-8.4 (95% CI -9.1, -7.7)	-1.1 (95% CI -1.2, -1.0)
Mean % body weight change	-1.5% (95% CI -1.6%, -1.3%)	-3.2% (95% CI -3.5%, -3.0%)	-0.4% (95% CI -0.4%, -0.3%)
Mean BMI change (kg/m <sup>2</sup> )	-0.5 (95% CI -0.6, -0.5)	-1.2 (95% CI -1.3, -1.1)	-0.2 (95% CI -0.2, -0.1)

<sup>a</sup> Intense is defined as eight or more visits within time period between first visit and 6-month follow-up weight measurement; sustained is defined as a span of at least 4 months between first visit and the last visit before the 6-month follow-up weight measurement

<sup>b</sup> Rounded to one decimal place



**Fig 2** | Weight change categories among the subset of MOVE! patients (*n*=31,854) and comparison patients (*n*=71,725) for which effectiveness measures were estimated overall and by gender. MOVE! patients are further stratified according to whether they received intense (at least 8 visits), sustained (over at least 4 months), both intense and sustained, or neither intense nor sustained treatment

facilities typically report higher numbers of FTEE providing MOVE! care. The median facility FTEE spent on program administration and coordination has increased from close to zero in FY 2006 to stabilizing at 0.15 in FY 2009 and FY 2010.

#### Implementation

The evidence suggests that effective behavioral weight management uses evidence-based behavioral strategies to help patients achieve an energy deficit through changes in diet and physical activity; thus, MOVE! was designed as a multidisciplinary program to ensure patient access to staff with skill and expertise. These qualifications are particularly important when dealing with patients with the complex medical and mental health problems that are commonly seen within VHA. While dietetic staff are the most common type of staff providing MOVE! treatment (median 0.63 FTEE per facility in FY 2010), staff from multiple other disciplines including psychologists (median 0.06 FTEE per facility), primary care nurses and physicians (median 0.15 FTE per facility), specialty care physicians and nurses (median 0.03 FTE per facility), and physical, occupational, recreational, or kinesiotherapists (median 0.05 FTE per facility) most commonly provide MOVE!-related care. However, only 39% of all facilities report that all key disciplines (dietetics, psychology, physical activity, and medical/nursing) are involved in providing MOVE! care to patients. Despite increases in the number of patients and visits seen with MOVE!, this estimate has not increased over time.

In FY 2010, all facilities provided patients with access to both individual and group-based treatment, and most (88%) provided access to FDA-approved weight loss medications as part of MOVE!. Group-based treatment has become increasingly utilized over the years; in FY 2010 it represented 72% of all MOVE!-related visits. Intensive options, such as residential or non-residential intensive behavioral treatment (several weekly or daily visits), medically monitored meal replacement programs, or very low calorie diets, were available at just over half of all facilities in FY 2010. Access to bariatric surgery (either on-site or through a community affiliate) was reported by 76% of facilities in FY 2010. Less than a quarter of facilities reported these more intensive medical and surgical services as available to patients in FY 2007.

In addition to multidisciplinary treatment, intensity of treatment is an important component of effective treatment. The average annual number of visits per unique patient receiving care within MOVE! has gradually increased since program implementation, reaching 4.6 visits/unique patient in FY 2010. However, 42% of patients stop receiving care after one visit. Of the subset of MOVE! patients included in the effectiveness measures analysis, the median visit intensity was 4.0 (IQR 6.0) and only

13.6% of patients met the definition for having received intense and sustained treatment.

Facilities have increasingly reported use of some evidence-based behavioral strategies within their MOVE! programs since initial implementation in FY 2006. In FY 2010, explicit goal setting, self-monitoring, and stimulus control were reported in use at 97%, 94%, and 96% of facilities respectively. Relapse prevention, cognitive therapies, and social support were also used frequently (83%, 78%, and 86% respectively). The use of incentives/awards was reported by only 36% of facilities. Moderately-highly structured diet plans and regular, onsite physical activity sessions were reported in use by about a quarter of facilities in FY 2010; these estimates have been stable since first assessed in FY 2008.

#### Maintenance

In FY 2010, nearly one-half of VA facilities reported that demand for weight management services exceeded local program capacity and continued growth in the number of patients seen and visits continues, although the rate of growth has leveled off in the most recent year, particularly for phone visits (see Fig. 1). Evaluation measures in earlier years largely focused on barriers to providing care. Access to scales, lack of systematic ways to screen patients for obesity, and lack of staff training were initial barriers that are no longer reported as significant. The specificity with which barriers have been assessed has decreased as adoption and implementation has progressed, and facilities now tend to have highly localized issues with highly localized solutions. Thus, more recent national-level assessments have focused simply on adequate staffing and adequate space/equipment. In FY 2010, a third to half of all facilities reported that staff specialties other than dietitians are barely or not at all sufficient to meet the needs of the program. In FY 2010, space suitable for group sessions and indoor physical activity facilities were reported as barely or not at all sufficient by 30% and 60% of facilities respectively. These estimates have been stable over the last 3 years. Access to computers and printers for patient to use is reported as barely or not all sufficient by about half of facilities and has not improved since initial implementation.

#### DISCUSSION

Within the past 5 years, the MOVE! Weight Management Program has been implemented throughout the VHA system, reaching a small proportion of VHA beneficiaries with modest yet beneficial short-term effects on weight loss. Our findings suggest that screening for obesity, which includes BMI measurement, risk counseling, and offering eligible patients the opportunity to participate in treatment, has been fully implemented in

VHA medical facilities. This was likely facilitated by VHA's electronic medical record, which automatically calculates BMI based on the entered height and weight, by an electronic clinical reminder that prompts clinicians once a year to discuss the risks of overweight and obesity and offer options for care and also by the introduction of a screening performance measure in 2008. Of note, the VHA's screening performance measure goes farther than the existing HEDIS<sup>®</sup> adult obesity screening measure, which requires documentation of BMI only, either as a claim or medical record entry—no discussion with the patient or offering of care is required.

Despite high levels of screening in a population with a high obesity prevalence, only 10 to 12% of patients engage in at least one treatment visit, and even fewer engage at a level recommended for behavioral weight management treatment [10]. This level of participation is commensurate with participation levels in other behavioral health programs in real world clinical settings, such as tobacco cessation programs, but limits the overall impact that the program can have on overall health of the VHA population. In this evaluation, only 13.6% of patients who participated in MOVE! engaged in our empirically derived definition of intense and sustained treatment, a definition similar to that derived from the literature [11]. Further, only 31.6% of patients engaged in intense and sustained treatment achieve a clinically relevant weight loss. Thus, there is a large translation gap between weight loss research trials and actual practice. Future research should focus on how to assist and motivate individuals to initially engage in treatment and keep them engaged if the interventions are to translate to actual practice in a way that meaningfully impacts the health at the population level.

Based on our evaluation, MOVE! appears to have a modest impact on short-term weight loss outcomes, and it appears that staff are targeting the intervention towards those most likely to benefit (e.g., patients with diabetes, hypertension, and/or hypercholesterolemia). While program policy, goals, and patient/staff tools are standardized and fully implemented, VHA facilities have considerable flexibility to standardize care delivery to their local environment, taking into account patient population, available program resources, and facility context. This local customization likely accounts for the variation in facility outcomes. While we do not present detailed information about variation among VHA facilities here, other evaluation work using qualitative comparative analytic methods to identify best practices suggests that the use of standard curriculum and providing group-based care are necessary for achieving larger facility outcomes [20]. These findings are in contrast with literature that suggests that the format of care (group vs. individual) is less important than the intensity of treatment using behavioral therapy [11]. Given the increasing role of group-based MOVE! care in the

VHA over the last several years, we hypothesize that group care may just be a practical way of providing an intense level of treatment within the VHA.

Whether treatment within MOVE! will translate to longer-term outcomes at 12 months and beyond is not yet known. Tracking longer-term outcomes in actual practice will be challenging as patients often transiently participate in behavioral programs. That is to say, they may participate actively for 3 months and then return to usual medical care for several years before being referred back to the program by clinicians or self-referring themselves back into active participation. Attributing longer-term changes in weight to MOVE! program participation will require development of methods to capture this type of complex behavioral intervention dosing.

Adoption of the MOVE! program by every VHA medical center and healthcare system was facilitated by having a national system-wide policy and an annual facility reporting requirement. Having national policy facilitated the establishment of a national performance measure and development of local clinical reminders related to obesity screening, which may not have been possible in the absence of national policy. The reporting requirement not only served as a mechanism for collecting organizational-level data with respect to the adoption and implementation of MOVE!, but it also served a secondary benefit that we did not anticipate: it brought the MOVE! program to the attention of senior facility leadership at regular intervals and served as a forum for the facility to review program status and make resource allocation decisions. At many facilities, this was critical for transforming MOVE! from a small, limited program, championed by one or two highly interested and motivated clinicians, to a fully institutionalized clinical service.

Some facilities have found a way to include staff from a variety of disciplines to provide MOVE!-related care, while the MOVE! program in other facilities is embedded within a single service line or department, most often Nutrition and Food Service. The extent to which this impacts the effectiveness of care is not known, particularly if effective behavioral strategies are used with patients regardless of the clinical staff or service line providing the care. Facilities generally have reported high rates of use of behavioral strategies on the annual facility report; however, our work conducting chart reviews and facility interviews performed as part of a separate evaluation suggest major limitations with facility self-report of use of behavioral strategies. While direct observation may be the gold standard for assessing the fidelity of implementation within research trials, it is not practical in actual practice. More work is needed to develop robust process measures to assess the intensity and quality of delivery of behavioral interventions, specifically weight management, within clinical settings.

Over the last several years we have seen increases in the availability of medications and intensive

medical and surgical options for weight management. Demand for these services is most likely driven by universal screening for obesity and the availability of behaviorally based treatment with the MOVE! program. MOVE! is now a pre-requisite or co-requisite for many of these higher risk/higher cost but potentially more effective interventions.

This evaluation has several limitations. While we attempted to ensure metrics were developed for all RE-AIM dimensions, metrics in some dimensions are more robust than in others. This was partly to maximize limited program evaluation resources and leverage existing VHA data wherever possible, including data captured in the electronic medical record. Weight data in particular are not always captured accurately or in the correct location for electronic extraction. Further, patients are not necessarily seen in clinic to have weights measured on a rigid protocol as in a research trial; thus, we relied on weights captured through the course of routine medical care. The required facility report used for several metrics within the adoption, implementation, and maintenance dimensions is not an anonymous or confidential report, as it is designed for facility accountability purposes. It is a useful report for a high-level, national overview of the program but less useful for a granular understanding of specific program elements or barriers. Items on it would require further validation if they are to be used in implementation research studies. Lastly, our evaluation lacks standardized patient experience measures.

Findings from the ongoing evaluation have guided MOVE! development and policy in many ways. For example, several options have been developed or are in development to address the challenges facilities report with respect to adequate staffing and meeting demand for services. A home telehealth program called TeleMOVE! was developed to provide facilities and patients with a non-face-to-face option for providing intensive treatment. Eligible patients enrolled in TeleMOVE! receive an electronic scale and a messaging device connected to their landline telephones. Through the messaging device, patients participate in a VHA-developed 90-day interactive protocol involving daily nutrition, physical activity, and behavioral information messages, goal setting, and self-monitoring. Patient responses are actively monitored by trained clinicians who intercede by phone when a patient indicates problems. Similarly, initial plans have been developed for eMOVE!, an electronic, interactive web portal for patients to use for self-managing weight. In addition to providing access to static patient materials already available at the MOVE! website ([www.move.va.gov](http://www.move.va.gov)), the eMOVE! portal will provide interactive tools for goal setting and self-monitoring and will offer engaging and dynamic content to keep patient motivation high. The VHA will soon be offering Telephone Lifestyle Coaching services as part of a limited pilot demonstration

within several facilities that will include weight management among the services provided. These alternative strategies for delivering MOVE! are likely to increase reach, but effects on effectiveness, adoption, implementation, and maintenance are uncertain.

The VHA began several large transformational initiatives in 2009 related to implementing patient-centered medical home principles and processes along with a culture transformation to more patient-centered care with a large emphasis on health promotion and disease prevention. Although it will take several years to be fully implemented, all primary care clinicians are receiving training and on-going support for using patient-centered communication strategies, including motivational interviewing and health coaching, in their interactions with patients as part of this transformation. We expect that this will support patient engagement and participation in MOVE! and could translate to improved and more durable outcomes.

## CONCLUSION

Evidence-based weight management treatment can be delivered at VHA medical centers and community-based outpatient clinics, but the reach of MOVE! remains limited after several years of implementation. Intense and sustained treatment with MOVE! results in a modest positive impact on short-term weight loss outcomes, but a relatively small proportion of patients engage in this level of care. Increasing reach, improving effectiveness of care, and keeping patients engaged in treatment through new modalities of care and better linkage with primary care teams are areas for future policy, practice, and research.

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