

Determining Barriers and Facilitators to Implementing the Resist Diabetes Intervention in the  
Salem Veterans Affairs Medical Center Patients

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## Abstract

With 47% of the veteran population aged 65 years or older, an age group with the highest prevalence of type 2 diabetes (T2D), prevention of T2D is critical within the Veterans Health Administration (VHA) system (1). Resist Diabetes (RD), a Social Cognitive Theory-based resistance training program, has been shown to reduce the prevalence of prediabetes by 34% in prediabetic older adults (2). The RD program could fill the gap within the VHA system for a structured diabetes prevention program not focused on weight, but instead focused on exercise. This thesis describes a mixed-methods investigation to determine what adaptations to the RD program are needed to implement the program within the Salem Veterans Affairs Medical Center (VAMC) patients. Salem VAMC care providers and veteran patients were recruited to gauge perceptions of the RD program, and identify barriers and facilitators to the referral process and program implementation. Semi-structured open-ended questionnaires and interview guides based upon the Consolidated Framework for Implementation Research (CFIR) (3) were utilized to determine major and minor themes within the provider and veteran responses. Quantitative data was also obtained to assess provider perceptions and participant characteristics. Major findings included: positive perceptions by providers for RD program acceptability, appropriateness and feasibility (4) within the Salem VAMC, positive perceptions of Intervention Characteristics of RD by veterans, major barriers to participation lied within the Outer Setting domain with travel, transportation, and time constraints. Major facilitators to program implementation lied within the Inner Setting domain with promotion by primary care. These findings could be used to inform a future version of the RD program adapted for the VHA system.

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**General Abstract**

With 47% of the veteran population aged 65 years or older, an age group with the highest prevalence of type 2 diabetes (T2D), prevention of T2D is critical within the Veterans Health Administration (VHA) system. Resist Diabetes, a Social Cognitive Theory-based resistance training program, reduced the prevalence of prediabetes by 34% in prediabetic older adults in the Roanoke, VA area. This thesis describes a mixed-method investigation to determine what adaptations to the Resist Diabetes program are needed to implement the program within the Salem Virginia Veterans Affairs Medical Center.

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## CHAPTER 1: Introduction

Diabetes can be characterized as a disease where the body does not produce insulin (Type 1) or does not produce enough and/or is resistant to insulin (Type 2; T2D) (1). Prediabetes is a condition that precedes T2D, where blood glucose levels are higher than normal, e.g., fasting plasma glucose (FPG) 100-125 mg/dL. Diabetes and prediabetes are very common among US adults. In 2017, 30.3 million individuals had diabetes, or 9.4% of the U.S population (2). In addition, 84.1 million US adults had prediabetes and only 11.9% of those adults were aware of their prediabetes diagnosis (2). Adults living in the southern or Appalachian regions of the United States exhibited the highest rates of diagnosed diabetes, as well as new cases (2).

The older adult population, aged  $\geq 65$  years, is affected by T2D more than any other age group. About one third of older adults has diabetes, and according to the Veterans Health Administration (VHA), almost one in four veterans being treated by the VHA has T2D (3). With the 2017 veteran population in the United States estimated at 20 million, nearly 5 million veterans are likely being treated for T2D (4). Furthermore, due to a high prevalence of overweight and obesity in the veteran population, it is estimated that 70% of veterans are at risk for developing T2D (5). This disease is also the leading cause of blindness, end-stage renal disease and amputation in VHA patients (3).

Diabetes is the seventh leading cause of death and accounted for more \$327 billion in total medical costs in 2017 (2,6). According the American Diabetes Association (ADA), 1 in every 7 health care dollars is spent treating diagnosed diabetes and accompanying conditions (6). Nearly 67% of that cost is covered by government insurance (Medicare, Medicaid and military) (6). The medical cost for patients being treated for diagnosed diabetes is nearly 2.3 times higher than those without diabetes (6). Although the current cost of diabetes in the VHA is not known,

between 1994-1998 the VHA incurred \$214.8 million in outpatient expenditures and \$1.45 billion in inpatient expenditures for veterans receiving care for diabetes within the VHA (7). With a high prevalence of older adults (>65 y), overweight and obesity, and 1 in 4 veterans being treated for T2D diabetes prevention efforts are needed within the VHA system.

The ADA recommends screening for T2D to start at age 45 years (8). A diagnosis of T2D requires a FPG of  $\geq 126$  mg/dL, two-hour plasma oral glucose of  $\geq 200$  mg/dL from a glucose tolerance test, an HgbA1c  $\geq 6.5\%$  or diabetes symptoms plus a two-hour plasma glucose  $\geq 200$  mg/dL (1,8). Prediabetes is diagnosed with a FPG of 100-125 mg/dL, HgbA1c of 5.7-6.4%, or two-hour plasma glucose of 140-199 mg/dL (8).

Following a prediabetes or T2D diagnosis, a Registered Dietitian Nutritionist should be consulted to develop an individualized eating pattern to achieve weight loss, glycemic, blood pressure and lipid goals (9). The ADA encourages a regular physical activity regimen as a lifestyle change. Physical activity regimens should include  $\geq 150$  minutes of moderate-intensity aerobic activity spread over  $\geq 3$  days per week with no more than two days without physical activity. Resistance training (RT) is also recommended in patients without any contraindications for  $\geq 2$  days per week. In obese and overweight patients, a modest a weight loss of 5-7% can reduce the risk of T2D (8). The Veteran's Administration and Department of Defense (DoD) guidelines also recommend working toward individual weight, glycemic, and blood lipid goals, preferably with a multi-disciplinary team (10). The VA/DoD follow the ADA in recommendations for physical activity, also includes an additional option of  $\geq 75$  minutes per week of vigorous-intensity physical activity in addition to the  $\geq 150$  minutes per week of moderate-intensity physical activity (8,10). Unlike the ADA recommendations, VA/DoD

guidelines do not include recommendations for RT demonstrating a gap in their recommendations (8,10).

Previous research has investigated lifestyle intervention to prevent T2D. These included The Diabetes Prevention Program (DPP), Healthy Living Partnerships to Prevent Diabetes (HELP-PD), The Veteran's Health and Administration Managing Overweight/Obesity for Veterans Everywhere (MOVE!), and VA-DPP (11-14). These programs were selected based upon criteria of being researched in the US, major translations of DPP in community settings or in veterans, and outcomes were related to weight loss and prevention of T2D. DPP is the landmark trial, which determined that modest lifestyle changes can reduce the risk of developing T2D (11). The latter interventions were all DPP translations or based upon the original DPP format. Program features and outcomes are summarized in Table 1 (12-14). DPP's modest lifestyle changes promoted a 7% weight loss by standardized calorie and fat goals and increasing physical activity. Modest lifestyle changes demonstrated a 58% reduction in the risk of developing T2D (11, 15, 16). These results were compared to metformin, which reduced by incidence by only 31%, suggesting that modest lifestyle changes were more effective than metformin (11).

HELP-PD, a translation of DPP, was developed to be introduced within a community setting by implementing group-based lifestyle interventions using existing community infrastructure and workers (12), making HELP-PD a more cost-effective translation of DPP (12). Since HELP-PD was based upon DPP, the program goals are similar: a modest weight loss of 5-7% through daily calorie recommendations and increased weekly physical activity (12). Help-PD demonstrated greater decreases in fasting blood glucose (-4.3 vs -0.4mg/dL), insulin (-6.5 vs -2.7  $\mu$ U/mL), homeostasis model assessment of insulin resistance (-1.9 vs -0.8), weight (-7.1 vs

1.4kg), BMI (-2.3 vs -0.3 kg/m<sup>2</sup>) and waist circumference (-5.9 vs -0.8 cm) in the intervention group compared to usual care at 12 months (17). Unlike DPP, HELP-PD was not designed to measure differences in diabetes incidence, although the glucose-reducing effects could lead to a significant reduction in T2D incidence (18).

MOVE! and VA-DPP were researched within the VHA. MOVE!, a weight management intervention, was designed based upon DPP (19,20). MOVE! was disseminated by the Veteran's Health Administration to VHA in the years between 2006-2008 and is free to all veterans receiving care through the VHA (19). MOVE! was designed to reduce overweight/obesity, although participation in the program was associated with lower T2D incidence (20). The hazard ratio comparing intense and sustained participants to non-participants was 0.67 (95% CI, 0.61-0.74). The study program also resulted in a hazard ratio of 0.80 (95% CI, 0.77-0.83) for "less active" participants (participants who engaged in at least one session of MOVE!) compared to non-participants (20). Despite being the largest weight management program offered in an integrated health care system, only 8% of eligible MOVE! patients attend a single session (21). MOVE! has been implemented in the VHA system for an estimated 10-12 years with demonstrated low attendance rates. Therefore, the development of additional programs or new approaches to prevention T2D are needed.

VA-DPP, another translation of DPP, was trialed within three geographically diverse VHA facilities using existing MOVE! framework in patients with prediabetes (14). In contrast to MOVE!, VA-DPP was designed specifically for T2D prevention (14). VA-DPP demonstrated significant weight loss at 6-months compared to MOVE!, but similar weight loss, HgbA1C, and health expenditures at 12 months (22). However, VA-DPP demonstrated higher attendance for a

least one program session than MOVE! (i.e. 73.3% vs 57.5%) (14,22). VA-DPP was not implemented nationally, and only one location continued the program.

The program faced similar barriers to sustainability as MOVE! (e.g. limited resources, time and staff) (14, 22).

Although physical activity is included as a component in DPP and related translational programs, none of these programs emphasized RT. As noted before, RT is recommended by the ADA for T2D prevention. Aging is associated with decreasing lean body mass and worsening glucose tolerance. Regular RT regimens have demonstrated improvements in insulin-resistance and sarcopenia in older adults (23-26). RT has also been shown to be a safe method for increasing physical activity in older adults (26). A 26-week study of 160 older obese adults was investigated aerobic, resistance training and combination aerobic and RT demonstrated a median attendance for exercise sessions at 96%, 98% and 93% respectively (27). Research suggests that effective RT protocols can be completed utilizing 20-30-minute sessions only 2-3 times per week (27).

The Resist Diabetes trial was a 15-month community-based study determining whether a social cognitive theory (SCT) based intervention improves RT maintenance and reduces the prevalence of prediabetes in older adults (28). Resist Diabetes included 170 sedentary older adults (aged 50-69 years) with prediabetes (28). The 15-month study consisted of four phases: Initiation, Transition, Maintenance and Follow up (28). The 3-month initiation phase involved two supervised RT sessions per week in the lab-gym. A whole-body, older adult RT protocol consistent with American College of Sports Medicine recommendations was used during the RT sessions (26,28). RT exercises included: leg press, leg extension, seated leg curl, calf raise, chest

press, lat pulldown, row, shoulder press, seated dip, lower back, abdominal crunch and rotary torso (26).

In the transition phase participants were randomly assigned to one of two RT conditions for 6 months: Social Cognitive Theory (SCT) based intervention or standard, usual care. The SCT based intervention was delivered 18 sessions: nine transition sessions and nine brief maintenance sessions (26). Transition sessions included workouts with and without trainers. At this point participants were transitioned to train at a self-selected facility (participants covered facility dues), participants were gradually transitioning to training on their own. Consistent with the SCT an individualized, hands-on intervention was focused on developing self-efficacy for RT and self-regulation (goal-setting, planning and problem solving) (26).

The standard care intervention followed similar procedures compared to the SCT condition, but did not include an individualized, hands-on transition approach. Participants received an initial session at the lab-gym regarding continuing RT, as well as a brief manual. Meeting with trainers took place only three times during the 4-week transition period (26).

The maintenance phase lasted for six months with the objective to consistently train twice per week. All records were kept on the website database. SCT participants received tailored feedback on online records as well as contact from a Follow-up coordinator. Standard care had limited access to the website and received generic feedback. Contact from the follow-up coordinator took place every 8-10 weeks (26) The 6-month follow up phase for both the SCT and standard conditions consisted of no-contact (26). Follow up assessments were performed at 3, 9 and 15 months (26)

At 3 months, 34% of Resist Diabetes participants were no longer prediabetic and this was maintained through month 15. Increases in muscular strength were also demonstrated at month 3

and maintained through month 15 (26). An overall retention rate of 76% was demonstrated with a RT regimen adherence of 53% at 15-months among participants (26).

The Resist Diabetes (RD) Trial also demonstrated that initiation of RT could be a gateway behavior leading to improvements in other health-related behaviors (29). Declining physical activity has been associated with deteriorating self-efficacy for activity in aging adults (30). Early lifestyle intervention in the prediabetic population provides an opportunity for health improvement prior to the devastating effects of T2D (30). However, standard treatments for T2D prevention utilizing moderate physical activity may not be optimal (31). A goal of body composition change, weight loss and concurrent risk reduction utilizing multiple health behavior changes, including RT, is needed (31). Given veterans' preference for strength training (33) and the need for an effective diabetes prevention program within the VHA in prediabetic patients, a program such as Resist Diabetes might be an alternative to existing diabetes prevention programs within the VHA system. Although the RD trial demonstrated program effectiveness, program adaptations are likely needed to translate the RD program into one that can be delivered in the Salem VAMC. Dissemination and Implementation research (D&I) focuses on the uptake of existing evidenced-based interventions (EBIs), already shown to be effective, in different organizational settings. Shrinking the gap between discovery and application in research (34), D&I research allows us to understand what implementation outcomes work the best for specific settings or inventions, allowing researchers to create adaptations to existing EBIs to facilitate successful implementation (34). RD has already been shown to be effective in the prediabetic, older adult population in the Roanoke and Salem, VA area. These characteristics make RD an ideal EBI to try to adapt and implement into the Salem VAMC, and perhaps other VHA facilities. Therefore, the purpose of this research was to inform the development of a modified

version of the Resist Diabetes program that could represent an option for reducing the incidence of T2D in VHA patients.

Table 1. Characteristics of major DPP translation trials.

Program	Inclusion Criteria	Referral Trigger	Session Structure	Staff	Program Goals & Outcomes	Program Limitations	Program Strengths	Cost
<b>VA-DPP</b>	HgbA1c between 5.7% - 6.4%, impaired fasting glucose or glucose tolerance and BMI $\geq$ 30 or $\geq$ 25 kg/m <sup>2</sup> with at least 1 comorbidity	Reminder within in electronic medical record (EMR) system to Primary VA Physician or VA Nursing Staff	-Individual -Closed Groups -22 weekly sessions (16 core sessions) -Telephone follow ups	Designated case managers or “lifestyle coaches” and closed groups	-Reduction in incidence of Type 2 diabetes with education on modest lifestyle changes (increased physical activity & dietary intake) -weight loss	-Not nationally implemented -Lack of communication -Time constraints -Funding -Staff perceptions -	-Increased attendance & engagement -Weight loss -T2D prevention	-VA-DPP: *implementing/recruiting = \$40,348 *Scheduling/reminder = \$28,462 *Cost per group = \$101/session
<b>HELP-PD</b>	BMI 25-40 kg/m <sup>2</sup> and impaired fasting blood glucose of 95-124 mg/dl.	Community announcements and provider referrals	-Individual -Closed Groups -16 core weekly sessions	Professional and community health workers	Weight loss, healthy lifestyle and changes in fasting glucose	-Not nationally implemented -Staffing -Consistency in interventions -Limited resources -Recruitment	-T2D prevention -Decreased blood glucose levels -Weight loss	-Direct Medical cost: \$850 over 2 years (2010 dollars) -Direct nonmedical costs: \$13,836 (over 2 years in 2010 dollars)
<b>MOVE!</b>	BMI $\geq$ 30 or $\geq$ 25 with 1 or more comorbidities	Reminder within EMR to Primary VA Physician or VA Nursing Staff	-Individual -Group -8-12 weekly sessions -phone or TELE-MOVE -MOVE! Mobile App	Multi-disciplinary teams	-Weight loss with education on modest lifestyle changes (increased physical activity & dietary intake)	-Lack of staff education & communication -Time constraints -Differences in staff's perceived roles -Lack of resources -Lack of consistency in charting -Program varies facility to facility	-Access to multi-disciplinary team -Reduced T2D risk -Weight loss	-Government funded -Free to vets

## **CHAPTER 2: Determining Barriers and Facilitators to Implementing the Resist Diabetes Intervention in the Salem Veterans Affairs Medical Center Patients**

### *Abstract*

With 47% of the veteran population aged 65 years or older, an age group with the highest prevalence of diabetes, prevention of prediabetes and T2D is critical within the Veteran Health Administration (VHA) system. Resist Diabetes (RD), a Social Cognitive Theory (SCT) based resistance training program tested in prediabetic older adults, reduced prevalence of prediabetes by 34%. The objective of this investigation was to determine what adaptations to the RD intervention program are needed to implement the program within the Salem, Virginia VAMC. Salem VAMC care providers and veterans were recruited to complete open-ended questionnaires and semi-structured interviews to gauge their perception of the RD program and Salem VAMC, identify barriers and facilitator to program participation and referral at the Salem VAMC, and interest in the RD program. Providers (n=20) completed a brief Weiner Survey and open-ended survey. Veteran participants (n=11) completed descriptive questionnaires and semi-structured interviews based on the Consolidated Framework for Implementation Research (CFIR). Thematic content from questionnaires and interviews was analyzed using the CFIR framework to determine major and minor themes. Both providers and veteran participants viewed the RD program as needed within the Salem VAMC. Providers identified the RD program as acceptable (MD/DO =  $4.81 \pm 0.24$ , Nursing =  $5.00 \pm 0.00$ , and Other providers =  $4.73 \pm 0.08$ ) appropriate ( $4.9 \pm 0.13$ ,  $5.00 \pm 0.00$ , and  $4.69 \pm 0.06$ ) and feasible ( $4.63 \pm 0.14$ ,  $4.83 \pm 0.34$ , and  $4.50 \pm 0.26$ ) at the Salem VAMC and all were willing to refer veterans to the program. Within Intervention Characteristics, veterans viewed the RD program as an effective way to prevent T2D and improve overall health benefits. Travel distance, transportation needs, and time constraints were

identified as major barriers within Outer Setting by both veteran and provider participants.

Promotion by primary care staff and positive perceptions of veterans were identified as major facilitators in the Inner Setting of program implementation. These findings will be used to develop and adapt a version of the RD program for the Salem VAMC. If successful, this program could be disseminated throughout the VAMC system wide.

## *Introduction*

A high prevalence of prediabetes and T2D in the U.S. led to major prevention efforts within the general public and veteran populations (11-14). An estimated 84 million Americans adults, aged 18 years or older, have prediabetes while approximately 30 million have diagnosed diabetes (1). American older adults, aged 65 years or older, continue to have the highest prevalence of the disease. In 2015, an estimated 25.2% of the population had diagnosed or undiagnosed diabetes, while nearly half, 48.3%, had prediabetes (1,35). With nearly 47% of the veteran population aged 65 years or older, diabetes prevention is a major issue within the VHA (36). The VHA reports that one in four veterans are being treated for T2D, which is the leading cause of blindness, amputations and renal disease within the veteran population (3).

The Diabetes Prevention Program (DPP), a landmark diabetes prevention trial, and major DPP translations (HELP-PD, MOVE! and VA-DPP) within the general and veteran population demonstrated that lifestyle changes such as monitoring calories and increasing physical activity can reduce risk of T2D (11-14). Resistance (RT) training in particular is effective in preventing T2D by improving insulin sensitivity and glucose control (39). However, despite the veteran population having a high affinity for structured exercise and strength training (33) none of these programs focused solely on physical activity, especially RT, as a preventive measure (11-14). RD is a Social Cognitive Theory-based intervention that used RT to reduce the prevalence of prediabetes (28). Resist Diabetes demonstrated a 34% reduction of prediabetes at month 3 and these results were maintained through month 15 (28). An increase in muscular strength was also demonstrated, which can help address the decrease in lean body mass and worsening glucose tolerance commonly associated with aging (37-40). Given the lack of effective diabetes

prevention programs in the VHA setting and veterans positive attitudes about structured exercise (33), the RD program could be a promising new approach for T2D prevention for veterans.

Although the program RD demonstrated program effectiveness, adaptations are likely needed for an effective translation of RD to the VHA system. Our objective was to identify barriers and facilitators in the Salem VAMC provider and veteran population to the dissemination and implementation of RD at the Salem VAMC. Using a mixed methods approach, we investigated provider and veteran perceptions of RD, capabilities of VHA facilities, acceptability, appropriateness and feasibility of RD, and identified major and minor themes regarding barriers and facilitators to RD dissemination and implementation within the Salem VAMC.

### *Methods*

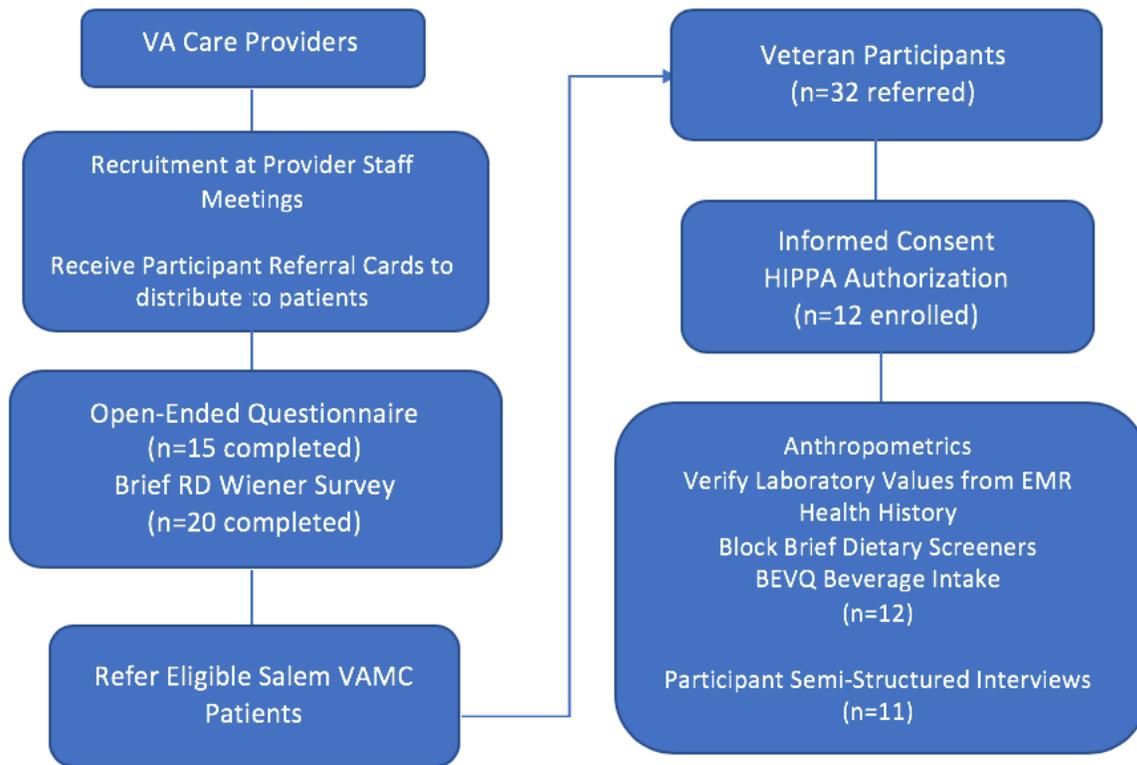
#### *Protocol Overview*

The study protocol is also presented in Figure 1. The mixed methods design focused on Veterans, VAMC care providers and administrators at the Salem VAMC. Care Providers, including physicians, nursing, behavioral health and administration staff completed the brief Weiner Survey (41) and an open-ended questionnaire. The brief Weiner Survey and questionnaire took approximately 20 minutes to complete. A Waiver of Documentation of Informed Consent was obtained for the provider portion of the study from the VA IRB. An informational paragraph was provided on the open-ended questionnaire which provided information to providers about participation. To identify the availability of onsite fitness facilities throughout the VHA system, which would be necessary to implement RD nationally. VHA fitness facility information was collected by two investigators (E. VanDerBrink and

J.Workowski) using on Internet search followed by phone calls to Veterans Affairs Healthcare Systems and Veterans Affairs Medical Centers (VAMCs) across the nation.

Veteran participants were Salem VAMC patients, over the age of 18, who met the criteria for prediabetes (HbA1c 5.7-6.4%, fasting glucose 100-125mg/dl, or 2-hr oral glucose tolerance 140-199mg/dl (8)), were medically stable and able to function independently. Veteran participants were initially recruited to undergo two 45-60-minute study sessions at the Salem VAMC: one baseline assessment and one focus group session. However, due to an extremely slow rate of enrollment and a lack of sufficient numbers of participants needed for focus groups, most participants completed all assessments in one study session which instead utilized an interview format with planned focus group questions. Most participants also preferred to complete all study components in one session. Veteran participants provided informed consent, HIPAA authorization and completed questionnaires during the study visit. Participant demographics, health history, anthropometrics, habitual physical activity and dietary questionnaires were collected in order to describe the participant population. The protocol and consent form were approved by the Institutional Review Board at the Salem VAMC. (The Virginia Tech ceded authority to the VAMC IRB since all study activities took place at the Salem VAMC)(Appendix I).

Figure 1. Study Protocol



### *Provider Recruitment*

Recruitment of providers occurred via brief presentations at three provider staff meetings or by recruitment emails from the VAMC Chief of Staff. Providers were eligible if they were physicians or other healthcare providers at Salem VAMC. Administrators and care providers were asked to refer and recruit veterans to participate in this study. Recruitment cards (for patients) (Appendix IV) were distributed to providers at beginning of the staff meetings. At the conclusion of the meeting providers were recruited to complete an open-ended questionnaire (Appendix II) developed by the research team based upon similar questions proposed by Damschroder et al (14). and the brief Weiner Survey (41) (Appendix III) to provide information on their willingness to refer their prediabetic patients to RD, barriers and facilitators to referral,

and the Acceptability of Intervention Measure (AIM), Intervention Appropriateness Measure (IAM), and Feasibility of Intervention Measure (FIM) [Weiner Survey] (41).

Fifteen providers completed the open-ended questionnaire and twenty providers completed the Weiner survey between March 2018 and January 2019. Providers were not compensated for referrals, but were provided with a \$7 Top Hat voucher for completing the questionnaire. This voucher could be used at the Salem VAMC Canteen.

### *Veteran Recruitment*

Twelve participants out of 32 recruited via provider referral were enrolled between April 2018 and January 2019. Participants were identified and recruited by Salem VAMC care providers based on their medical history or electronic medical record information (EMR). Of those recruited, one participant did not complete the study (Figure 1). Participants were provided informed consent and HIPAA authorization to allow for EMR access prior to the beginning of the study session. Participants received a \$20 Kroger gift card for their participation at the end of the study session.

### *Procedures*

#### *Quantitative Assessments: Providers*

Providers completed the Weiner Survey to assess the Acceptability of Intervention Measure (AIM), Intervention Appropriateness Measure (IAM), and Feasibility of Intervention Measure (FIM) for the RD program (41). This measure was developed by Weiner et al (41) based upon implementation outcomes defined by Proctor et al (42): Acceptability: perception of the intervention among stakeholders is agreeable, or satisfactory, Appropriateness: the perception of the fit of intervention into the practice setting or with consumers to fit a specific problem, Feasibility: the extent an intervention can be integrated and carried out within that given setting

(42). These three implementation outcomes (Acceptability, Appropriateness and Feasibility) have shown to be leading indicators for implementation success (42). Weiner et al developed the Weiner Measures (AIM, IAM and FIM) to fill a need of reliable and valid implementation outcomes measure, which is currently lacking in implementation research (42). Each measure category (AIM, IAM, and FIM) included 4 items to measure the providers' perceptions of the RD program. Each item was scored on a 1-5 scale, 1 being "Completely Disagree" and 5 being "Completely Agree". (See Appendix IV). The brief and pragmatic qualities of the Weiner survey made it appropriate for providers of all levels of the Salem VAMC organization in a brief time period, which worked with the providers busy schedules.

#### *Quantitative Assessments: Veteran Participants*

Participants completed the following questionnaires to assess demographic dietary, and health history information. The Block Brief dietary screeners (Appendix V and VI) (43) assessed usual fruit, vegetable, fat and fiber intake. The dietary screeners included 27 total and took <10 minutes to administer. The brief Beverage Intake Questionnaire (BEVQ) (44) (Appendix VII), provided information on habitual beverage intake. The BEVQ contains 15 items and takes 3-4 minutes to complete. Participants also completed a Health History questionnaire (Appendix VII).

Laboratory measurements included height, body mass, BMI, hemoglobin A1C, fasting plasma glucose, and oral glucose tolerance test. Height was measured to the nearest cm, with shoes (due to ease of session visit), on a scale-mounted stadiometer. Body mass was measured, with shoes, in clothing to nearest 0.1 lbs. using a clinical digital scale. BMI was calculated as weight (kg)/height (m<sup>2</sup>). HgbA1c, FPG and OGTT (if available) were obtained using the electronic medical record (EMR). The total time for participants to complete questionnaires, screeners and anthropometric varied from participant to participant.

### *VHA Fitness Facilities*

One hundred and fifty-nine VHA facilities nationwide were identified via the U.S Department of Veterans Affairs Location by State website. This information was entered into an Excel spreadsheet, with the contact information for each facility. Investigators (E. VanDerBrink and J. Workowski) contacted VAMC staff by phone (e.g. Employee Health, MOVE! Dietitians, Physical Therapists and Recreational Therapists) at each location to inquire about the availability of onsite fitness or gym facilities for veterans, employees or both. Type of equipment and staff were also investigated. This data is presented in Appendix XI.

### *Qualitative Assessment: Providers*

Providers completed an open-ended questionnaire developed by the research team to characterize perceptions of the RD program and prediabetes, barriers and facilitators to referral and program implementation within the Salem VAMC, communication and referral methods. All provider interactions were conducted by either one or two investigators (E. VanDerBrink, B. Davy).

### *Qualitative Assessments: Veteran Participants*

A semi-structured interview guide (Appendix IX) was developed using the Consolidated Framework for Implementation Research (CFIR) (45). CFIR was created to consolidate existing implementation theories into one framework to identify factors that affect intervention implementation within VHA facilities and to provide consistent terminology within implementation science (45). CFIR includes 37 defined constructs, within five domains that influence implementation. These domains consist of: characteristics of the intervention (e.g. characteristics of the RD intervention, evidence strength, and quality), the outer setting (e.g. Salem VAMC patient needs and existing programs), inner setting (compatibility of RD with

existing Salem VAMC programs and key stakeholders), process of implementation (e.g. receptiveness of stakeholders and leadership at the Salem VAMC), and characteristics of the individuals (e.g. knowledge and perceptions of Salem VAMC patients (45). CFIR provides a framework to identify implementation barriers and facilitators, which informs intervention adaptations to develop the “best-fitting” version of the intervention for the organization (45). CFIR was also used to guide qualitative data coding and analysis (46).

Semi-structured interviews were conducted to characterize veteran’s perceptions of the RD program and the Salem VAMC, and barriers and facilitators to veteran referrals and program participation within the CFIR domains. Of the 12 participants enrolled, 11 participants completed the interviews. Interviews were conducted by one investigator (E. VanDerBrink), who recorded written responses to questions, and a second investigator (B. Davy), who also recorded written responses and observations, and ensured all topics were covered. Sessions were not recorded due to VAMC IRB preference.

#### *Data Analysis*

Block Brief Screeners (43), Health History and BEVQ (44) were reviewed for accuracy and completeness prior to their analysis. Statistical analysis was conducted using SPSS statistical analysis software (SPSS v. 25 for Mac). Analyses included descriptive statistics (means, standard error, and frequencies). Differences by gender were determined using Independent Samples t-tests. The alpha level was set *a priori* at  $P < 0.05$ . Data was expressed as mean  $\pm$  SEM or %.

The provider open-ended questionnaires and participant interviews were analyzed using content analysis and the CFIR coding framework (46,47) (Appendix X). Both investigators (B. Davy and E. VanDerBrink) entered provider and participant responses independently into Excel. Transcriptions were then compiled for comparison and content verification. One investigator (E.

VanDerBrink) tabulated individual responses across constructs by reviewing participant interview responses, written notes and provider questionnaire responses. Major and minor themes were identified within each construct. “Major themes” were defined as responses given by  $\geq 50\%$  of participants, and “minor themes” were defined as responses given by 25-49% of participants (47). Thematic content from the questionnaires and interviews were analyzed using CFIR published coding framework. Similar responses were grouped within each CFIR construct to detect the major and minor themes. These themes were organized within the CFIR framework domains and constructs and presented in Tables 6 and 7. (46).

## *Results*

### *Participants*

The providers (n=20) were predominately from the Salem VAMC behavioral health division, including PsyD and PhD’s (65%) (Table 1). The veteran participants (n=12) were predominately white, female, and overweight (BMI =  $33.6 \pm 6.4$  kg/m<sup>2</sup>) (Table 2). The mean age for the sample was  $65.0 \pm 10.0$  y. Females were significantly younger and shorter than the male participants. Prediabetes diagnoses (i.e., ICD code) were only present in the EMR on 6 (50%) of the participants, all of whom were female participants (Table 2). The veteran population in this investigation was unique compared to previous VHA research, which tends to be predominately white males.

### *Physical Activity*

In general, all participants engaged in some regular physical activity during the week. Participants reported completing at least 2.4 hours of moderate and 1.3 hours of vigorous physical activity per week. The breakdown of physical activity type is displayed in Table 3. The ADA and VA/DoD both recommend  $\geq 150$  minutes (2.5 hours) of moderate intensity activity per

week (8,10), and participants were close to meeting this recommendation on average. Participants did meet the vigorous physical activity recommendation based on VA/DoD recommendations. Most participants did meet muscle strengthening exercise recommendations of at least 2 days per week (8). This could be attributed to a portion of the participants being involved in Gerofit (n=4), which is a weekly physical activity program focused on older adults at the Salem VAMC. Mean reported sedentary time for the sample was  $6.8 \pm 2.7$  hours on a weekday and  $7.2 \pm 4.4$  hours on a weekend day, which was not significantly different between males and females.

#### *Dietary Behaviors*

Habitual dietary and beverage intake for males and female participants are presented in Tables 3-4. Male participants consumed significantly more dietary fat, saturated fat and dietary cholesterol than female participants. Female participants' intake of micronutrients magnesium, potassium and fiber were significantly higher than male participants. Participants only met the recommended intake for servings of fruits and vegetables, Vitamin C and dietary cholesterol. There were no significant differences between males and females in beverage intake, other than sugar sweetened beverage fl oz. Males consumed more SSBs than females ( $p=0.05$ ).

#### *Provider Perceptions of RD Acceptability, Appropriateness and Feasibility*

Mean scores for the adapted RD Weiner Survey are provided in Table 5. Providers (n=20) scored each measure on a scale 1-5 (1= Completely Disagree) (5= Completely Agree). All providers (n=20) completed the Weiner Survey, which was general, and brief compared to fifteen providers completing the open-ended questionnaire, which was more time intensive. All providers scored the RD intervention between 3-5 ("Neutral" – "Completely Agree") in all categories. The MD's (n=3), who included two administration members, scored RD at 5

(“Completely Agree) in all categories. Lowest scores, although still close to ‘completely agree’ were in the Feasibility section. Higher scores are associated with positive perceptions of the intervention in the context of that category (AIM, IAM and FIM)(\*).

#### *Overall Provider Perceptions of RD*

The open-ended questionnaire revealed several major\* and minor† themes pertaining to providers’ perceptions of RD, barriers and facilitators to referral, the veteran population and barriers and facilitators to program implementation. Provider responses including illustrative quotes are presented in Table 6.

#### *Intervention Characteristics*

Providers generally perceived that having multiple behavior change programs at the Salem VAMC could target different patient demographics and their varying preferences. For example, program offerings may include: MOVE! for weight management, Gerofit for older adults and Resist Diabetes for diabetes prevention. Therefore, RD could provide another option another option for Salem VAMC patients. Administration is open to offering new programs at the Salem VAMC, especially if budget is minimally impacted. The biggest concern for providers was the ability for veterans to complete the 12-week intervention period.

#### *Outer Setting, Needs and Resources of Those Served by the Organization*

The biggest barrier for veterans based on provider response was travel and transportation to the Salem VAMC. Providers noted that a significant portion of veterans live long distances away from the Salem VAMC, and limited ability to travel and long driving time may influence program participation rates. Besides transportation limited finances and time will affect participant according the providers. However, veterans may have existing appointments or

commitments at Salem VAMC and these could be coordinated with program session. Also, if veterans are to be responsible for any program costs, this may deter participation.

#### *Inner Setting, Network and Communications*

In terms of referring veterans to programs the providers perceive that their preferred method of communication would come from primary care. Phone calls and email can also prove to be effective methods of referral for veterans. For communicating and educating providers, staff meetings and email were the preferred method of the communication. Providers indicated that educating them on the program and inclusion criteria at staff or department meetings would be the most impactful.

Provider generally believe that Salem VAMC administration is receptive to offering new interventions. Although receptive, administration and providers, especially primary care, have overwhelming schedules and limited time. Despite these barriers, providers were receptive to offering and promoting new programs at the Salem VAMC. Also, providers noted that veterans are used to receiving referrals to different opportunities on a regular basis and are welcome to new programs.

According the Salem VAMC providers there is a high prevalence of prediabetes and T2D within the veteran population. This could impact the veteran's quality of life. Providers noted a high prevalence of older, overweight/obese and sedentary veterans. A Veterans often have other comorbidities that could contribute to a high risk of T2D development; Resist Diabetes was perceived to be a beneficial diabetes prevention program for this population.

#### *Characteristics of Individuals*

All providers had a positive view of the RD program, and all stated they would refer patients to RD. Based on the evidence basis for RD program effectiveness, providers perceived the program as encouraging to improve health.

#### *Process*

Communication with providers via staff meeting and email was preferred. Reminding them of the program inclusion criteria and protocol will need to be done periodically to keep the program on the radar of providers and administration.

#### *Veteran Perceptions of RD*

The participant interviews revealed several major\* and minor† themes pertaining to their perceptions of RD, barriers and facilitators to participating in a program like RD, characteristics of the veteran population and barriers and facilitators to program participation. These results are provided in Table 7.

#### *Veterans: Intervention Characteristics*

The majority of the participants have not participated in other lifestyle programs at the Salem VAMC. Some had participated in or were referred to either MOVE! or Gerofit. Participants were open to RD and based upon a description of RD, participants were excited about an opportunity to reduce their risk of T2D through this type of program. A majority of the veterans were excited about the possibility of training with a personal trainer in RD. A majority of participants stated a preference for beginning their training initially with a personal trainer then transitioning to training with a group. The participants were open to group-based training as long as the group size was kept small (10 or less participants).

#### *Veterans: Outer Setting*

Mirroring the provider results, participant perceived travel and distance to Salem VAMC as the major barrier to program participation. Participants noted they were not aware of any resources provided by the Salem VAMC that could aid in transportation or program involvement in general. Time and scheduling conflicts were also noted by the participations as a potential barrier to participation. Participants noted existing disabilities and PTSD symptoms could limit program participation.

#### *Veterans: Inner Setting, Networks and Communications*

Participants preferred finding out new programs through their Primary Care Physicians (PCP) at their appointments. Word of mouth from other veterans was also a preferred method of hearing about new programs. PCP and fellow veterans provide a basis of trust, which was important for the participants. In terms of technology-based communications, veterans preferred a phone call, especially text messages.

In general participant believe that other veterans would be interested in and welcome the RD program. Participants noted a high prevalence of T2D and prediabetes within their population, consistent with their older age, overweight/obesity and a sedentary lifestyle. Diabetes prevention was important to the participants.

The majority of the participants knew about the Salem VAMC's onsite fitness facility. Some of participants enrolled in Gerofit already use this gym on a weekly basis.

#### *Veterans: Characteristics of Individuals*

A majority of the participants noted having a limited knowledge of prediabetes, and remarked that RD offered a way to resist T2D and "not become a full-blown diabetic". The majority of the participants were aware of their prediabetes diagnosis and had been informed of their diagnosis by their primary care physician, or they knew someone effected by the disease. In

addition to preventing T2D, participants believed that RD allows participants to get active and back in shape. Most of the participants wanted to be involved with RD when it's introduced to the Salem VAMC. Some hesitations were not knowing what exercise were involved in the protocol. Despite this hesitation, all by one veteran was interested in participating.

#### *Veterans: Process*

Participants identified primary care staff, especially PCPs has their preferred method of referral. Primary care staff continues to be identified as key stakeholders in program implantation and promotion. Besides primary care staff, veterans identified phone calls and word of mouth as impactful method of promotion.

#### *VHA Fitness Facilities*

Investigators identified 159 VAMC facilities across the US. Over half of the total facilities had a fitness or gym facility on their campus for either veterans or employees to use (Table 8). Of these facilities, the majority of the fitness or gym facilities were for employees only, but the capabilities were there to offer access to veterans. A small portion of the VAMCs did not have any fitness or gym locations on campus (11%) and another portion did not respond to investigators (28%).

#### *Discussion*

This study demonstrated that Salem VAMC providers and veteran participants had a high affinity for the RD program. The brevity of the Weiner Survey items was important for the research team in order to reduce clinician burden and, thereby, increase completion rate. Based on the Proctor et al (42) implementation outcome definitions for the Weiner Survey, providers view the RD intervention as: acceptable or satisfactory, appropriate for the Salem VAMC and its veteran population, and feasible to implement and integrate within the Salem VAMC. As

positive perceptions of acceptability, appropriateness and feasibility are predictors of program uptake (42), this work suggests that providers at the Salem VAMC may refer to and support the RD intervention. suggesting that providers have a positive perception of the implementation process of the RD intervention. The open-ended questionnaire for providers and semi-structured interviews for veteran participants demonstrated positive perceptions of the RD program, and identified key program adaptations needed to create an effective version of the RD program for the Salem VAMC. Major barriers to RD participation were mirrored in both provider questionnaires and participant interviews as travel distance, transportation needs and time constraints (for both veteran and providers). That these barriers will need to be addressed in adaptations to the RD program. Key RD program facilitators identified by the provider questionnaires and veteran interviews suggest that primary care staff, specifically physicians, will be key stakeholders in program promotion and implementation. Veterans perceive the RD program as an effective and beneficial program that can aid in preventing T2D and improving quality of life of the Salem VAMC veterans. Also, Salem VAMC is one of the 61% of national VAMC facilities with an onsite fitness facility capable of sustaining the RD program.

Within the VHA, MOVE! and VA-DPP are major translations of DPP. MOVE! specifically targeted weight management, while VA-DPP focused on diabetes prevention (14). MOVE! is a multidisciplinary program focused on patient centered goal setting and is delivered using small educational group sessions (13). VA-DPP uses the existing MOVE! referral infrastructure, but targeted for T2D prevention in prediabetic veterans (14). VA-DPP utilized group-based, closed cohorts, goal setting and consistent program coaches (14). A comparison of these programs did not find significant differences in HgbA1c between the two programs, however VA-DPP had higher participation and weight loss at 6-months (13). More VA-DPP

participants completed more session than the MOVE! participants (13). MOVE! and VA-DPP focus on lifestyle changes, including educating on increasing physical activity, however neither include in-session exercise (13, 14). MOVE! is available at every VHA facility, but VA-DPP is only available at a few (13, 14). Given veterans' affinity for group-based strength training exercise (33), the availability of fitness centers in many VHA facilities, positive perceptions from both provider and veterans of the RD intervention and the need for a dedicated diabetes prevention program within the VHA, the RD program could be a promising option within the VHA system. The RD program may be particularly appealing to those veterans searching for physical activity-based program diabetes prevention program.

Limitations of this study included a small sample size, which could limit the generalizability of these results to the VHA population as a whole. With regard to reported physical activity (PA), the PA question format of the Health History questionnaire may have could have confused veterans and led to overestimation of physical activity in this investigation. Previous research demonstrates that a small portion of veterans meet physical activity recommendations and VA using veterans are less likely to me physical activity recommendations than non-using veterans (54). Utilization of a reliable and valid physical activity specific questionnaire in continuing research would be recommended. The preference of the VA IRB for no audio recording veteran interviews limited our ability to transcribe veteran answers to the semi-structured interview questions, although two interviewers were present to record interview fieldnotes and responses. An extremely slow recruitment process precluded using the focus group format, which could have provided more insight to the veteran experience and culture at the Salem VAMC. Although, this investigation had strong physician champion within the Women's Clinic and Gerofit, a champion within Primary Care likely would have aided in

recruitment of veteran participants. Utilizing other types of provider, such as Registered Dietitian Nutritionists (RDN), may help reach veterans. Another limitation of this study is the lack of triangulation and internal relationships in the provider open-ended questionnaire and veteran semi-structured interview guide questions and responses. More coordination of the questions on each measure to gain more insight on provider, administrator and veteran views on the CFIR constructs is recommended. This methodology would likely increase the number of meaning units within the responses. The responses on the provider open-ended questionnaire and veteran interview guide provided limited meaning units and limited the number of CFIR constructs addressed in this investigation. Future investigations should include more probes and less directed questions to provide more responses and include more CFIR constructs, like Culture which plays a large role within the VHA system.

Strengths of this study include the mixed methods approach, the inclusion of providers and veteran patients a diverse sample, with the majority of the veteran participants being female and the inclusion of one transgender veteran. This research team's experience demonstrates that identifying a physician champion within the VHA Women's Clinic can increase the recruitment of participants, particularly women. This study also demonstrated that female participants are willing and want to take part in VHA programs and offerings which is important since females are viewed as an underserved population within the VHA system. Another strength of this study was the variety of provider participants in differing levels within the Salem VHA organization (i.e. nursing staff to administrators), and that staff recruitment at provider staff meetings and email are effective methods of communicating with care providers in the Salem VAMC system.

Given the high prevalence of prediabetes and T2D in the older adult male population and in veterans, T2D prevention is a critical need in the VHA (1,3,35). However, the VHA is lacking

a structured diabetes prevention program in their facilities. The RD program could fill this gap in the system. This study demonstrated a positive perception in both providers and veteran participants for the RD program. Providers viewed the RD program as acceptable, appropriate and feasible for the Salem VAMC facility. Adaptations addressing travel, transportation, and scheduling needs will need to be addressed for the RD program to be successful in the Salem VAMC. Despite, the identified barriers, if the RD program is proven to be effective within the Salem VAMC it could potentially be translated to other VHA facilities across the nation.

Table 1. Provider characteristics

<b>Type of Provider</b>	<b>n</b>	<b>%</b>
Medical Doctor (MD)* or Doctor of Osteopathic Medicine (DO)	4	20.0
Nursing (RN & LPN)	3	15.0
Other Providers (e.g. PsyD & PhD)**	13	65.0

\*MD Included two administrators

\*\* Included one administrator

Table 2. Veteran participant demographic characteristics

Characteristic	Mean ± SEM <sup>a</sup>	n (%)
<b>Gender</b>		
Male		5 (42.0)
Female		8 (58.0)
Transgender		1
<b>Age, y</b>	65.0 ± 2.9	
<b>Race</b>		
White		9 (75.0)
African American		3 (25.0)
<b>Height, in</b>	68.5 ± 1.2	
<b>Weight, lbs.</b>	222.3 ± 11.3	
<b>Body Mass Index (BMI), kg/m<sup>2</sup></b>	33.6 ± 1.9	
<b>Prediabetes Diagnosis in EMR<sup>b</sup></b>		
Yes		6 (50.0)
No		6 (50.0)
<b>HgbA1c, %</b>	5.7 ± 0.5	
<b>FPG, mg/dL<sup>c</sup></b>	92.8 ± 13.7	
<b>Education</b>		
High School		2 (16.7)
College Degree		8 (66.7)
Master's Degree		2 (16.7)
<b>Occupation</b>		
Retired		7 (58.3)
Employed		2 (16.7)
No Response		3 (25.0)
<b>Current Tobacco Use</b>		
Smoking		1 (8.3)
Non-Smoking		11 (91.7)
<b>Alcohol Use</b>		
Alcohol Use		3 (75.0)
No Alcohol Use		9 (25.0)

<sup>a</sup>SEM = standard error of mean

<sup>b</sup>EMR = Electronic Medical Record

<sup>c</sup>Available for 10 participants. No OGTT results were available in the EMR

Table 3. Quantitative health behavioral characteristics of veteran participants.

<b>Characteristic</b>	<b>Mean ± SEM<sup>a</sup></b>	<b>Recommended<sup>b,c</sup></b>
<b>Mild Exercise</b>		
Hours per week	3.3 ± 0.57	
Minutes per session	41.8 ± 15.42	
<b>Moderate Exercise</b>		
Hours per week	2.4 ± 0.65	150 minutes/week
Minutes per session	30.8 ± 8.98	
<b>Strenuous Exercise</b>		
Hours per week	1.25 ± 0.59	75 mins/week
Minutes per session	4.17 ± 2.53	
<b>Muscle Strengthening Exercise</b>		
Hours per week	2.4 ± 0.67	2-3x per week
Minutes per session	23.8 ± 7.39	
<b>Sedentary Time</b>		
Hours per week day	6.9 ± 0.77	
Hours per weekend day	7.2 ± 1.29	
<b>Fruit and Vegetable Score</b>	12.2 ± 0.8	
<b>Fruit, Vegetable and Bean Score</b>	16.7 ± 0.9	
<b>Fruit and Vegetable Servings/day</b>	5.2 ± 0.3	Adults 5 servings/day
<b>Vitamin C (mg)</b>	99.4 ± 6.7	Adults aged 19yo+ Females: 74mg/day Males: 90mg/day
<b>Magnesium (mg)</b>	224.1 ± 18.1	Adult aged 19yo+ Males: 400-420mg Females: 310 -320mg
<b>Potassium (mg)</b>	2289.1 ± 154.9	Adults aged 19yo+ 4700mg
<b>Dietary Fiber (g)</b>	7.8 ± 1.2	Adults 19yo+ 25-30g
<b>Dietary Fat Score</b>	21.5 ± 2.8	
<b>Total Fat (g)</b>	100.2 ± 8.0	Adults 19yo+ 20-35% total calories
<b>Saturated Fat (g)</b>	23.4 ± 2.0	Adults <10% total calories
<b>Percent (%) Fat</b>	36.0 ± 1.9	Adults 19yo+ 20-35% total calories
<b>Dietary Cholesterol (mg)</b>	219.4 ± 15.4	Adults 19yo+ <300mg

<sup>a</sup> SEM = standard error of mean

<sup>b</sup>Reference (8,10)

<sup>c</sup>Reference (48)

Table 4. Habitual beverage intake characteristics of veteran participants

Type of Beverage	Male Mean ± SEM <sup>a</sup>	Female Mean ± SEM <sup>a</sup>	P
<b>Water or Sparkling water</b>			
Daily fluid ounces	48.2 ± 33.5	41.1 ± 9.0	0.818
Daily kcal	0.0 ± 0.0	0.0 ± 0.00	-
<b>100% Fruit Juice</b>			
Daily fluid ounces	2.6 ± 1.2	1.2 ± 0.8	0.339
Daily kcal	46.7 ± 21.6	21.3 ± 14.8	0.339
<b>Sweetened Juice Beverage/Drink (fruit punch, juice cocktail, etc)</b>			
Daily fluid ounces	6.4 ± 6.4	0.1 ± 0.1	0.263
Daily kcal	91.5 ± 91.5	1.6 ± 1.6	0.263
<b>Whole milk, 2% Milk or Chocolate Milk</b>			
Daily fluid ounces	5.0 ± 1.9	0.7 ± 0.5	0.032
Daily kcal	98.2 ± 38.6	13.6 ± 9.4	0.032
<b>Low-fat and skim milk</b>			
Daily fluid ounces	3.5 ± 2.4	0.3 ± 0.2	0.140
Daily kcal	42.6 ± 28.8	4.0 ± 2.8	0.140
<b>Nut milk (almond cashew, coconut)</b>			
Daily fluid ounces	0.2 ± 0.2	1.3 ± 0.9	0.329
Daily kcal	1.6 ± 1.6	13.0 ± 9.2	0.329
<b>Soft Drink, Regular</b>			
Daily fluid ounces	4.2 ± 1.8	0.0 ± 0.0	0.016
Daily kcal	56.4 ± 23.6	0.0 ± 0.0	0.016
<b>Energy &amp; Sports Drink, Reg. (Red Bull, Gatorade, Powerade)</b>			
Daily fluid ounces	3.4 ± 3.1	0.0 ± 0.0	0.216
Daily kcal	48.2 ± 44.1	0.0 ± 0.0	0.216
<b>Diet or Artificially Sweetened Soft Drink, Energy &amp; Sports Drink</b>			
Daily fluid ounces	0.0 ± 0.0	0.0 ± 0.0	-
Daily kcal	0.0 ± 0.0	0.0 ± 0.0	-
<b>Sweet Tea (with sugar)</b>			
Daily fluid ounces	0.6 ± 0.6	2.3 ± 2.3	0.554
Daily kcal	6.4 ± 6.4	27.3 ± 26.5	0.502
<b>Tea or Coffee, black</b>			
Daily fluid ounces	2.7 ± 1.7	0.2 ± 0.2	0.117
Daily kcal	0.0 ± 0.0	0.1 ± 0.1	0.424
<b>Tea or Coffee (w/ milk &amp;/or Creamer)</b>			
Daily fluid ounces	13.6 ± 8.4	18.3 ± 8.4	0.709
Daily kcal	83.3 ± 51.2	52.9 ± 24.4	0.568
<b>Wine (red or white)</b>			
Daily fluid ounces	1.1 ± 1.1	7.4 ± 7.4	0.496
Daily kcal	23.1 ± 23.1	153.3 ± 153.0	0.496
<b>Hard Liquor (vodka, rum, tequila, etc)</b>			
Daily fluid ounces	0.0 ± 0.0	0.0 ± 0.0	-
Daily kcal	0.0 ± 0.0	0.0 ± 0.0	-
<b>Beer, Ales, Wine Coolers, Non-alcoholic or Light Beer</b>			
Daily fluid ounces	0.3 ± 0.3	0.0 ± 0.0	0.255
Daily kcal	3.3 ± 3.3	0.0 ± 0.0	0.255
<b>Total Alcohol</b>			
Daily fluid ounces	1.4 ± 1.1	7.4 ± 7.4	0.518
Daily kcal	26.4 ± 22.5	153.3 ± 153.0	0.507
<b>Total Milk</b>			
Daily fluid ounces	8.6 ± 3.9	2.3 ± 1.1	0.097
Daily kcal	142.4 ± 60.2	30.5 ± 29.7	0.057
<b>Total Sugar Sweetened Beverage</b>			
Daily fluid ounces	28.3 ± 11.4	5.9 ± 2.8	0.050
Daily kcal	285.8 ± 142.1	58.3 ± 29.7	0.094
<b>Total Beverages</b>			
Daily fluid ounces	91.9 ± 31.0	73.1 ± 12.9	0.544
Daily kcal	501.2 ±	283.2 ± 165.3	0.425

<sup>a</sup> SEM = standard error of mean

<sup>b</sup> Reference (44)

Table 5. Provider perceptions of Acceptability, Appropriateness and Feasibility of Resist Diabetes<sup>a</sup>

	<b>MD*/DO (n=3) Mean ± SD</b>	<b>RN/LPN (n=3) Mean ± SD</b>	<b>Other Providers (PsyD, PhD) (n=13) Mean ± SD</b>
<b>Acceptability of Intervention Measure (AIM)</b>			
Resist Diabetes VA meet my approval?	5.00 ± 0.00	5.00 ± 0.00	4.69 ± 0.48
Resist Diabetes VA is appealing to me?	4.75 ± 0.50	5.00 ± 0.00	4.69 ± 0.48
I like Resist Diabetes VA.	4.50 ± 1.00	5.00 ± 0.00	4.69 ± 0.48
I welcome Resist Diabetes VA.	5.00 ± 0.00	5.00 ± 0.00	4.84 ± 0.38
<b>Intervention Appropriateness Measure (IAM)</b>			
Resist Diabetes VA seems fitting for Salem VAMC.	5.00 ± 0.00	5.00 ± 0.00	4.69 ± 0.48
Resist Diabetes VA seems suitable for Salem VAMC.	5.00 ± 0.00	5.00 ± 0.00	4.62 ± 0.51
Resist Diabetes VA seems applicable for Salem VAMC.	4.75 ± 0.50	5.00 ± 0.00	4.77 ± 0.44
Resist Diabetes VA seems like a good match for Salem VAMC.	5.00 ± 0.00	5.00 ± 0.00	4.69 ± 0.48
<b>Feasibility of Intervention Measure (FIM)</b>			
Resist Diabetes VA seems implementable.	4.50 ± 1.00	5.00 ± 0.00	4.54 ± 0.52
Resist Diabetes VA seems possible.	4.75 ± 0.50	5.00 ± 0.00	4.77 ± 0.44
Resist Diabetes VA seems doable.	4.75 ± 0.50	5.00 ± 0.00	4.54 ± 0.52
Resist Diabetes VA seems easy to use	4.50 ± 1.00	4.33 ± 0.58	4.15 ± 0.80
*MD included two Admin/MD staff members **Other providers included PsyD and PhD, one admin.			
<sup>a</sup> Scored on a scale 1-5			

Table 6. Provider questionnaire response themes for Resist Diabetes

CFIR Construct	Major* and minor † themes
<b>Intervention Characteristics</b>	
<i>Relative Advantage</i>	Having multiple programs to target different patient demographics and preferences is preferred.* Would provide an additional option to the existing repertoire of lifestyle programs offered at Salem VAMC.* One-on-one structure of RD offers a more personalized approach. † P: <i>This would be a nice addition and not competition. It adds another option.</i>
<i>Complexity</i>	Completing the full program of 12 full body exercise or attending for 12-weeks may deter some veterans from finishing or participating.* Low motivation and unwillingness to experience discomfort. † P: <i>I think a major thing is 'life happens' and you may have to learn that.</i>
<i>Cost</i>	Motivated to integrate new programs as long as budget is minimally, if not affected. † P: <i>Admin always wants new programs but won't pony up the resources. Clinical staff [are] usually willing to pitch in.</i>
<b>Outer Setting</b>	
<i>Needs &amp; Resources of Those Served by the Organization</i>	Majority of the veteran population will have travel and transportation as a barrier to participation*. Scheduling conflicts and time constraints will be existing medical or mental health appointments will likely affect participation and attendance.* The economic status of the veteran population will affect attendance and sustainability of the intervention if the veteran will be required to pay.* Fear of trying new interventions due to PTSD, gender and motivation may affect participation. † P: <i>This region, due to poverty and culture (i.e. Appalachian), tends to have people who don't believe these programs work for them". P<sub>2</sub>: Travel is always a barrier.</i>
<b>Inner Setting</b>	
<i>Networks and Communications</i>	Providers prefer communication about new interventions at staff meetings or over email.* Primary Care staff (Physicians and nursing) are primary contacts for referrals and informing veterans of new programs.* Phone call and text messages are also effective methods for referring and communicating with veterans.* Email can be utilized for veteran communication. † Flyers provided by primary care, staff or visible in common areas to promote the intervention.* Veterans communicate with each other and spread news about new programs by word of mouth. † The Salem VAMC newsletter, social media and MyHealthe Vet mobile app could be utilized for informing veterans of new programs. † P: <i>"Handouts and warm hand offs"</i>
<i>Implementation climate</i>	Administration is receptive to new interventions.* Vets are used to referrals and would welcome the opportunity.* Veterans would be interested, but depending on their location, time and availability.* Veterans will be open if providers emphasize the effectiveness and benefits. † P: <i>"I think overall veterans would be open to it, especially if encouraged by providers.</i>

<i>Relative Priority</i>	High prevalence of T2D and prediabetes within the veteran population.* Veteran’s quality of life (sedentary, overweight/obese and comorbidities) are contributing to a high risk of T2D.* High risk due because of an aging population. † P: <i>Yes! Diabetes is rampant in our patient population. It would be great to have more preventable interventions available.</i>
<b>Characteristics of Individuals</b>	
<i>Knowledge and Belief</i>	Yes, will refer patients to RD.* Encourages improvement in health. † P: <i>Yes! It would be questionably ethical not to [refer patients].</i>
<b>Process</b>	
<i>Engaging</i>	Provider education at staff meetings and via email.* Reminders of intervention and inclusion criteria. † P: <i>As long as inclusion criteria are widely shared, [identification] should be fine. P<sub>2</sub>: Only issue is effectively keeping it on the radar. P<sub>3</sub>: [Admin] is receptive if the steps are clear and efficient for referral.</i>
<i>Key Stakeholders</i>	Primary care staff.*
* Represents a “major theme”, defined as a response given by >50% of the participants † Represents a “minor theme”, defined as a response given by 25-49% of the participants P = Participant illustrative quote	

Table 7. Veteran interview response themes for Resist Diabetes.

CFIR Construct	Major* and minor† themes
<b>Intervention Characteristics</b>	
<i>Relative Advantage</i>	Have not participated in other lifestyle programs at the Salem VAMC.* Referred to the MOVE! program. † Gerofit participation. † Programs for prevention are important. † Excited to be able to train with a personal trainer.* Starting training initially one-on-one than transition to group format*. Group-based initially. † P: <i>At Gerofit 3x/week and MOVE! once a month!</i> P <sub>2</sub> : <i>People pay a lot of money for that. A personal trainer like the movie stars!</i>
<i>Evidence Quality and Strength</i>	Decreases the risk for getting T2D.* Reduced glucose, that huge. † Reduced HgbA1c. † Weight loss. † Sounds effective. † P: <i>I don't see them not having it, it would benefit veterans.</i>
<i>Complexity</i>	Attending for 12-weeks may defer some veterans from finishing or participating.* Time period.* Conflicting appointments. † Don't quite understand it all. † Weight lifting. † P: <i>Schedule. That's the only thing, otherwise I'd be here.</i>
<b>Outer Setting</b>	
<i>Needs &amp; Resources of Those Served by the Organization</i>	Travel and distance from Salem VAMC*. Don't know about available resources from the Salem VAMC to aid in program participation.* Scheduling conflicts, other appointments.* Fear of trying new interventions due to PTSD. † Limitations due to comorbidities or existing disabilities. † Need for childcare. † P: <i>Travel mainly, I would have 3 hours of driving.</i> P <sub>2</sub> : <i>My handicap. Time with other appointments, some can be moved, some can't.</i>
<b>Inner Setting</b>	
<i>Networks and Communications</i>	Find out about new programs through primary care physicians at visits.* Word of mouth from other veterans.* Phone calls, especially texts. Everyone has a phone* Email. † Social Media, maybe a Facebook group. † Occasionally flyers. † I read the newsletter. † MyHealththe Vet mobile app. † All something we are going to see. † P: <i>Providers or I hear about it while I am here.</i> P <sub>2</sub> : <i>Only if you see you physician and they relay it to you.</i> P <sub>3</sub> : <i>Word of mouth or twice a year from my primary doctor.</i>
<i>Implementation climate</i>	I think other veterans would be interested.* I don't know about other veterans. † P: <i>Maybe like half the patients. If it was explained why they should do it instead of being a full-blown diabetic.</i> P <sub>2</sub> : <i>Anybody who knows they have issues with diabetes, you'd be stupid not to participate... Exercise is ingrained in vets.</i>
<i>Relative Priority</i>	High prevalence of T2D and prediabetes within our population.* Most of us are older, overweight and sedentary.* There's no reason not to implement RD, they need it.* Prevention and education for T2D. † P: <i>You see people missing their feet or legs, it was either war or diabetes. Most of the time it's diabetes</i> P <sub>2</sub> : <i>Prevention is better than a cure. This will prevent them from getting diabetes.</i> P <sub>3</sub> : <i>I don't see not having it, it would benefit veterans.</i>

<i>Structural Characteristics</i>	Yes, I know about the onsite fitness facility.* No, I didn't know we even had an onsite gym. † You have to referred or in Gerofit to go to the gym. † P: <i>Yes, but didn't know before Gerofit. They had one program before though, but only for 6 weeks. Then no more.</i>
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**Characteristics of Individuals**

<i>Knowledge and Belief on Innovation</i>	Offers a way to resist diabetes and not become full blown diabetic.* Get people active, back in shape and doing something.* Sounds like a good program to participant in.* Overall health benefits. † P: <i>So, I don't get diabetes. When I get old, I want to be independent. Independence is a huge thing for me.</i>
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<i>Other Personal Attributes: Knowledge of Prediabetes</i>	I don't know anything about prediabetes.* Prediabetes is when you have the characteristics leading up to T2D.* Not full blown T2D.* Informed by Primary Care Physician or staff.* Family history or knows someone with diabetes. † Don't like it [prediabetes and T2D]. † Expected the diagnosis. † Frustrated, unhappy or depressed about the diagnosis. † Not aware of the diagnosis. † P: <i>It brought back bad memories since my wife died of it [T2D].</i> P <sub>2</sub> : <i>On your way to type 2 diabetes and all the medications.</i>
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<i>Self-Efficacy</i>	Yes, I want to be involved.* Depends on the exercises, but I can do it.* I could do the exercises.* Sharing the experience and doing it with others. † Learn the proper technique, then I can do it. † P: <i>I need to do something, I sit around too much and eat too much.</i> P: <i>Losing weight and getting back in shape. Just sitting around, I don't feel good.</i> P <sub>2</sub> : <i>I'm with somebody. I'm another guy.</i>
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**Process**

<i>Engaging</i>	Primary care referrals.* Email* Phone calls* Word of mouth from other veterans.* Flyers in common areas. † Newsletter. † P: <i>Something I am going to see.</i> P <sub>2</sub> : <i>[With referrals] You have a have a basis of trust of where you heard it.</i>
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<i>Key Stakeholders</i>	Primary care staff.*
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\* Represents a “major theme”, defined as a response given by >50% of the participants

† Represents a “minor theme”, defined as a response given by 25-49% of the participants

P = Participant illustrative quote

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Table 8. VHA Availability of Fitness Facilities (n=159)

	<b>Total Number of Facilities n</b>	<b>%</b>
<b>Fitness Facility on Campus</b>	97	61.0
<b>No Fitness Facility</b>	17	10.7
<b>No Response</b>	45	28.3

### **CHAPTER 3: Implications for Future Research**

The significant prevalence of T2D within the Veterans Health Administration (VHA) system is evident (3). Diabetes is the leading cause of blindness, renal disease and amputation within VHA patients (3). However, the prevalence of prediabetes is not known within the VHA system (49) and research on prediabetes prevalence within the VHA is scarce. A previous investigation estimated the prevalence of prediabetes to be 28% within a population of 1,830 patients at three Veteran's Affairs Medical Centers (VAMC) (49). Additional research is needed to address the prevalence of prediabetes and what programs are needed to increase awareness of the disease state within the VHA system patients and among providers. Inclusion criteria to RD requires a prediabetes diagnosis, introduction of the RD intervention to a VHA facility could help increase the number of prediabetic Veterans who have a prediabetes diagnosis in their EMR..

The results of this study suggest the need to pilot the adapted version of the Resist Diabetes (RD) within the Salem VAMC. A future direction for this investigation is to explore the translatability of the RD program into the Salem VAMC, utilizing an implementation and dissemination framework such as RE-AIM (reach, efficacy/effectiveness, adoption, implementation and maintenance) to evaluate the RD program's effectiveness and sustainability within the organization (50). The CFIR framework provides a foundation for the "I" or implementation portion of RE-AIM (45). Findings from a RE-AIM evaluation of the RD program in the Salem VAMC could inform future translations of the program in the VHA system nationwide.

Travel distance and transportation needs were identified as major barriers by provider and veterans to RD participation in this investigation. These barriers were also identified in MOVE!

and VA-DPP evaluations (See Chapter 1, Table 1). Adaptations to piloted versions of the RD investigation will need to address these barriers. The VHA offers transportation assistance from the Veterans Transportation Program (VTP) in the form of: Beneficiary Travel (BT), which reimburses veterans based on their level of service connection for costs incurred when traveling to VHA, Veterans Transportation Service (VTS), which is safe and reliable transportation options for veterans and access varies by facility and Highly Rural Transportation Grants (HRTG), which provides grants to Veteran Service Organizations (VSO) and state agencies in approved rural areas. These services vary from facility to facility. The Salem VAMC only provides BT to qualifying veterans and does not have VTS and HRTG options (55). Working with Salem VAMC providers to identify BT qualifying veterans who participate in a piloted RD intervention could aid in transportation costs. Partnering with local community wellness and fitness facilities to provide the RD intervention to veterans at a discounted or free rate in surrounding towns and cities could aid in reducing travel distance and increase participation in RD.

Along with monitoring the strengths and challenges of a RD program implementation, an important aspect of the evaluation would be a cost effectiveness analysis of the intervention within the Salem VAMC. The results in this investigation from the open-ended provider questionnaires demonstrated that the Salem VAMC is receptive to offering new interventions, however, administration wants to limit the effect on budget. This major theme is likely to be mirrored in other VAMCs across the VHA system. The RD program will use existing infrastructure for resources (i.e. onsite fitness facility) and patient identification (i.e. electronic medical record (EMR), however exact cost of the intervention is unknown. Cost was not formally evaluated in the original RD trial, although an informal cost was estimated to be \$1800

per participant for the initiation, SCT transition and maintenance periods (51). These findings could inform adaptations of the RD program that would improve cost effectiveness of the program in other VHA facilities which may be important to address budget concerns at the administration level.

Lastly, another future direction of this investigation is to evaluate behavior change in veterans following completion of the piloted RD program. A previous investigation from the original RD trial revealed a “spill-over” effect after the prolonged training in dietary behaviors and aerobic physical activity (52,53). Monitoring participants at post-intervention at follow ups to determine if habitual food and beverage intake and other types of physical activity is warranted. Our findings, and previous research on intervention effectiveness and the high retention rate of the original RD intervention suggest that veterans have positive perceptions of RT and may possibly experience improvements in other health behaviors resulting from program participation (51-53).

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*Appendix I*

**Davy, Brenda**

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**From:** Hicks, Tracy A SAMVAMC <Tracy.Hicks2@va.gov>  
**Sent:** Thursday, January 11, 2018 11:50 AM  
**To:** Boshra, Soheir S SAMVAMC; Davy, Brenda  
**Cc:** Hicks, Tracy A SAMVAMC  
**Subject:** IRB Chair approval of new protocol SSB 0001  
  
**Importance:** High

This is to inform you that your study entitled, “**Resist Diabetes Qualitative Study**” was approved with contingencies on 12/4/17 and now has full IRB approval. Your revised documents have been approved by administrative review on 12/20/17.

**It is necessary at this time that you send me an electronic version of your informed consent and HIPPA so that the IRB protocol number and approval date may be added.** I will then return to you electronically the IRB approved and dated copy of the Informed Consent and HIPPA to be printed for your use and record keeping.

The continuing review period will be for one year and the IRB approval is valid through 12/3/18. Be sure the protocol is submitted for Continuing Review or Closure before this date.

As you know, you may not begin your research until you have received all the following:

- An approval of the changes requested by the committee
- An IRB approval letter (form 10-1223)
- An R&D approval letter.

Thank you.

Research & Development Salem VAMC

**Approval Form for Continuing Review**

IRB Protocol Title: Resist Diabetes Qualitative Study

IRB Protocol Number: SSB 0001

-----  
*For IRB Chair, or designee, use only:*

This study does  require review by the SRS or does not  require review by the SRS.

**Recommendation:**

Approved by Continuing Review at convened IRB meeting date: 11/5/18

1. Risk level:  Minimal  More than minimal  High

2. Risk to Benefit Ratio:  Reasonable  Other:

3. Next review in:  12 months  6 months  Other:

4. Approval "valid through date": 11/4/19

Signature of IRB Chair (or designee) mamta sapra  
Digitally signed by mamta sapra  
Date: 2018.11.15  
13:29:05 -05'00'

-----  
*For SRS Chair, or designee, use only for continuing review, **if SRS review is applicable:***

Approved by Continuing Review at convened SRS meeting date:

Signature of SRS Chair (or designee)

-----  
*For R&D Committee Chair, or designee, use only:*

Concur with recommendations of SRS and IRB Chairs or designees.  
Project is approved for Continuing Review at convened R&D meeting date: 11/26/18

Brian V. Shenal 200258  
Digitally signed by Brian V. Shenal 200258  
Date: 2018.11.21  
10:11:01 -05'00'

Signature of R&D Chair (or designee)

Research & Development Salem VAMC

-----  
*For ACOS/R&D use only for continuing review:*



This research project can be continued until next review.

ELIAS LIANOS Digitally signed by ELIAS  
LIANOS 1510845  
Date: 2019.01.03  
16:53:17 -05'00'  
1510845  
**Signature of ACOS/R&D**

## VA Care Provider Survey

Name: \_\_\_\_\_ Care Provider Role (MD, RN, etc): \_\_\_\_\_  
VA Mailcode (for us to send TopHat meal voucher): \_\_\_\_\_

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Resist Diabetes is a Social Cognitive Theory (learn by doing) based diabetes prevention program which utilized a strength/resistance exercise training (RT) protocol to prevent Type 2 Diabetes in prediabetic adults. The program was previously delivered to older, overweight sedentary people with prediabetes living in the Roanoke region. The researchers found that this program reduced the prevalence of prediabetes by about 35%, significantly improved muscular strength, improved body composition and systolic blood pressure. We would like to offer this program to VAMC patients with prediabetes, who would participate in a 45-60 min RT sessions 2x per week at the Salem VAMC's onsite fitness facility. The RT program consists of 12 muscle strengthening exercises, with 8-12 repetitions each. The study starts with a 12-week initiation phase, supervised by a Personal Trainer, to master the RT protocol. This is followed by a period of transition to training independently at the onsite fitness facility.

Q1. As a provider, do you perceive prediabetes to be a significant problem within the Salem VAMC? Why or why not?

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Q2. "Resist Diabetes VA" will focus on Salem VAMC patients who are prediabetic. Inclusion criteria includes a prediabetes diagnosis. How would prediabetic patients within Salem VAMC be identified? Please list any barriers or facilitators to this process.

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Q3. Please describe any cultural, economic or gender factors within the Salem VAMC patient population that might prevent patient participation in Resist Diabetes?

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Q4. What communication tools (e.g. phone call, mobile apps, email, others) would be most effective for providers to refer patients to new programs within the Salem VAMC? Please describe barriers and facilitators for physician referrals.

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Q5. How do you think Salem VAMC patients will respond to being referred to Resist Diabetes? To what degree do you think the patients would be interested in participating in the program?

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Q6. What barriers to participation do you foresee Salem VAMC patients will face with participating in the Resist Diabetes protocol (attending RT sessions 2x per week, completing 12 RT exercises and 6 month study duration)?

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Q7. How receptive is the Salem VAMC to integrating new programs, or interventions like Resist Diabetes?

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Q8. How willing are Salem VAMC administrators to integrate new programs? How willing are physicians to integrate these new programs? Who are the key stakeholders in this process?

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Q9. How does your perception of Resist Diabetes compare to your perceptions of MOVE! Or Gerofit? Do you think the Salem VAMC needs multiple programs? Why or Why not?

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Q10. How do you typically find out about new intervention programs or initiatives at the Salem VAMC? Is there a method you prefer over others? Why?

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Q11. As a provider, would you refer a Salem VAMC patient who is prediabetic to the Resist Diabetes program? Why or why not?

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Thank you for participating in this research study! Please send the completed survey to Dr. Soheir Boshra at the VAMC's Women's Clinic (WHC), via interoffice mail. We will mail your TopHat meal voucher thru interoffice mail shortly.

The Resist Diabetes VA Research Team

**Information Sheet – Resist Diabetes VA Qualitative Study for Care Providers**

The purpose of this study is to gather information needed to develop a new resistance training (RT, also called “strength training”) exercise program for the VA patient population, aimed at diabetes prevention. The new program will be based upon the Resist Diabetes RT program, which was shown in a previous study to reduce the risk of diabetes among individuals with prediabetes. This study will consist of group discussions with VA patients, and a survey of care providers and administrators. The researchers are interested in things such as whether or not care providers would be interested in referring their patients to an RT program, and if VA administrators would support offering this type of program at the Salem VA. Findings from this research will be used to develop an RT program which best meets the needs of the VA patient population and the VA setting.

If you agree to take part in this study, **please let us know today and we will give you the survey to take with you.** You will be asked to provide your name and title, and respond to issues such as your willingness to refer patients to the program, barriers and benefits of patient participation. Estimated completion time is **15-20 minutes**. This study is an observational study only and does not require any additional research procedures. You may not directly benefit from participating in this research study. By participating in this study, you will contribute to the development of a new RT program for VA patients who are at a high risk of developing diabetes. Your participation is voluntary. VA Care providers and administrators will receive a Top Hat voucher for use in the Canteen (\$7 value), sent to you through the VA internal mail system, following the return of your survey. The source of funds for this study is the Salem Research Institute (SRI).

**Even if you do not want to complete the longer survey described above, your feedback to the questions below would be greatly appreciated!**

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Care Provider Role (MD, RN, etc):  
\_\_\_\_\_

INSTRUCTIONS: Please fill in the bubble that best matches your perceptions of Resist Diabetes VA.

**Acceptability of Intervention Measure (AIM)**

	Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
1. Resist Diabetes VA meets my approval.	①	②	③	④	⑤
2. Resist Diabetes VA is appealing to me.	①	②	③	④	⑤
3. I like Resist Diabetes VA.	①	②	③	④	⑤

4. I welcome Resist Diabetes VA.	①	②	③	④	⑤
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**Intervention Appropriateness Measure (IAM)**

	Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
1. Resist Diabetes VA seems fitting for Salem VAMC	①	②	③	④	⑤
2. Resist Diabetes VA seems suitable for Salem VAMC.	①	②	③	④	⑤
3. Resist Diabetes VA seems applicable for Salem VAMC.	①	②	③	④	⑤
4. Resist Diabetes VA seems like a good match for Salem VAMC.	①	②	③	④	⑤

**Feasibility of Intervention Measure (FIM)**

	Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
1. Resist Diabetes VA seems implementable.	①	②	③	④	⑤
2. Resist Diabetes VA seems possible.	①	②	③	④	⑤
3. Resist Diabetes VA seems doable.	①	②	③	④	⑤
4. Resist Diabetes VA seems easy to use.	①	②	③	④	⑤

Thank you!

*Appendix V*

**Recruitment Card (to be given to eligible patients by their Primary Care Service Line providers)**

The Department of Veterans Affairs (VA) is one of the leaders in health research. An investigator at the Salem VA Medical Center, Dr. Soheir Boshra, is conducting a research study to learn if patients and care providers at the Salem VA are interested in having a diabetes prevention program called “Resist Diabetes” offered here. The program is a weight training program aimed at preventing type 2 diabetes (T2D). This exercise program would need to be modified if it were offered at the Salem VA, so that it could meet the needs of Salem VA patients. The objective of the study is to learn more about what program modifications would be needed, from VA patients and care providers.

This study will consist of two study sessions, each lasting 45-60 minutes. Participants will be asked to complete several questionnaires related to their health, diet and exercise habits, and participate in a group discussion with research staff and other VA patients. Participants will receive \$20 for being involved in the study, in the form of a Kroger gift card, upon completion of the study.

Since you may qualify for this research study, please contact the researchers at XXXXXXXX if you might be interested in participating. The researchers can also provide more details about what is involved, if you are interested in learning more about the study.

## Dietary Fat Screener<sup>©</sup>

Name :

Age:

Sex:     Male             Female



**Think about your eating habits over the past year or so. About how often do you eat each of the following foods? Remember breakfast, lunch, dinner, snacks and eating out. Mark one bubble for each food.**

<b>Meats and Snacks</b>	(0)	(1)	(2)	(3)	(4)	<b>Score</b>
	1/ MONTH or less	2-3 times a MONTH	1-2 times a WEEK	3-4 times a WEEK	5+ times a WEEK	
Hamburgers, ground beef, meat burritos, tacos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Beef or pork, such as steaks, roasts, ribs, or in sandwiches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Fried chicken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Hot dogs, or Polish or Italian sausage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Cold cuts, lunch meats, ham (not low-fat)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Bacon or breakfast sausage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Salad dressings (not low-fat)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Margarine, butter or mayo on bread or potatoes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Margarine, butter or oil in cooking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Eggs (not Egg Beaters or just egg whites)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Pizza	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Cheese, cheese spread (not low-fat)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Whole milk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
French fries, fried potatoes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Corn chips, potato chips, popcorn, crackers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Doughnuts, pastries, cake, cookies (not low-fat)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Ice cream (not sherbet or non-fat)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
<b>Fat Score =</b>						_____

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 510.704.8514

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## Fruit-Vegetable-Fiber Screener<sup>©</sup>

Name :

Age:

Sex:     Male         Female



**Think about your eating habits over the past year or so. About how often do you eat each of the following foods? Remember breakfast, lunch, dinner, snacks and eating out. Mark one bubble for each food.**

Fruits and Vegetables	(0)	(1)	(2)	(3)	(4)	(5)	Score
	Less than 1/WEEK	Once a WEEK	2-3 times a WEEK	4-6 times a WEEK	Once a DAY	2+ a DAY	
Fruit juice, like orange, apple, grape, fresh, frozen or canned. (Not sodas or other drinks)	<input type="radio"/>	_____					
How often do you eat any fruit, fresh or canned (not counting juice?)	<input type="radio"/>	_____					
Vegetable juice, like tomato juice, V-8, carrot	<input type="radio"/>	_____					
Green salad	<input type="radio"/>	_____					
Potatoes, any kind, including baked, mashed or french fried	<input type="radio"/>	_____					
Vegetable soup, or stew with vegetables	<input type="radio"/>	_____					
Any other vegetables, including string beans, peas, corn, broccoli or any other kind	<input type="radio"/>	_____					
Fiber cereals like Raisin Bran, Shredded Wheat or Fruit-n-Fiber	<input type="radio"/>	_____					
Beans such as baked beans, pinto, kidney, or lentils (not green beans)	<input type="radio"/>	_____					
Dark bread such as whole wheat or rye	<input type="radio"/>	_____					
<b>Fruit Vegetable Score =</b>							_____

**BLOCK DIETARY DATA SYSTEMS**

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## Beverage Questionnaire (BEVQ-15)

Participant ID: \_\_\_\_\_

**Instructions:**

Date: \_\_\_\_\_

- For the past month, please indicate your intake for each beverage type by marking an "X" in the bubble for "how often" and "how much each time".
1. Indicate how often you drank the following beverages, for example, if you drank 5 glasses of water per week, mark 4-6 times per week.
  2. Indicate the approximate amount of beverage you drank each time, for example, if you drank 1 cup of water each time, mark 1 cup under "how much each time". If applicable, indicate the specific type of beverage by marking an "X" in the bubble by the one used (i.e., type of nut milk).
  3. When trying to estimate your intake throughout the day, (i.e., water) think about the total amount you drink. For example, 3 times per day and 20 fl oz each time = 60 fl oz per day. **If you consume more 60 fl oz per day select "1 time per day" and write the TOTAL daily amount in the last column.**
  4. Do not count beverages used in cooking or other preparations, such as milk in cereal.
  5. Count milk/creamer added to tea and coffee in the tea or coffee with creamer beverage category, NOT in the milk categories; this includes non-dairy creamer. Please indicate the type of creamer (flavored, plain or sugar-free) and sweetener used by marking an "X" in the bubble by the one used, if applicable.

Type of Beverage	HOW OFTEN (MARK ONE)						HOW MUCH EACH TIME (MARK ONE)						
	Never or less than 1 time per week (go to next beverage)	1 time per week	2-3 times per week	4-6 times per week	1 time per day	2 times per day	3+ times per day	Less than 6 fl oz (¼ cup)	8 fl oz (1 cup)	12 fl oz (1½ cups)	16 fl oz (2 cups)	20 fl oz (2½ cups)	> 20 fl oz (specify TOTAL daily amount)
Water or unsweetened sparkling water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
100% Fruit Juice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Sweetened Juice Beverage/Drink (fruit punch, juice cocktail, Sunny Delight, Capri Sun)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Whole Milk: red cap, Reduced Fat Milk 2%: purple cap, or Chocolate Milk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Low Fat 1%: green cap, Fat Free/Skim Milk: light blue cap, Buttermilk or Soy Milk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Nut Milk (almond, cashew, coconut) <input type="radio"/> Flavored, Original, or Plain <input type="radio"/> Unsweetened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Soft Drinks, Regular	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Energy & Sports Drinks, Regular (Red Bull, Gatorade, Powerade)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Diet or Artificially Sweetened Soft Drinks, Energy & Sports Drinks (Diet Coke, Crystal Light, artificially sweetened sparkling water, Sugar-Free or Total Zero Red Bull, Powerade Zero)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Sweet Tea (with sugar)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Tea or Coffee, black (no creamer or milk) <input type="radio"/> Sugar, <input type="radio"/> Artificial Sweetener, <input type="radio"/> N/A	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Tea or Coffee (w/ milk &/or creamer) <input type="radio"/> Sugar <input type="radio"/> Artificial Sweetener <input type="radio"/> N/A <b>Milk &amp;/or Creamer:</b> <input type="radio"/> Milk <input type="radio"/> Half & Half or Cream <input type="radio"/> N/A Creamer: <input type="radio"/> Flav. <input type="radio"/> Plain <input type="radio"/> Sugar-Free	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Wine (red or white)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Hard Liquor (vodka, rum, tequila, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Beer, Ales, Wine Coolers, Non-alcoholic or Light Beer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Other (list): _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____

**Resist Diabetes – VA Pilot Project**  
**HEALTH HISTORY QUESTIONNAIRE**

**STUDY** \_\_\_\_\_

**DATE** \_\_\_\_\_

**SUBJECT ID #** \_\_\_\_\_

**PLEASE PRINT**

1. May be contact you by phone, if we need to follow up with you? If so, please provide a phone number: \_\_\_\_\_

2. Employer: \_\_\_\_\_ Occupation: \_\_\_\_\_

3. Date of Birth: \_\_\_\_\_ Age: \_\_\_\_\_ Sex: \_\_

Race

White  Black or African American  American Indian/Alaskan Native

Asian  Native Hawaiian/Other Pacific Islander  Other

Ethnic Origin

Hispanic or Latino  Not Hispanic or Latino

4. **GENERAL MEDICAL HISTORY**

Do you have any current medical conditions? YES  NO   
If Yes, please explain:

Are you allergic to any medications? YES  NO   
If Yes, please explain:

Have you had any major illnesses in the past? YES  NO   
If Yes, please explain:

Are you currently taking any medications or supplements, including aspirin, hormone replacement therapy, or other over-the-counter products?

YES  NO

If Yes, please explain:

**Medication/Supplement Reason Times taken per Day Taken for how long?**

Have you been diagnosed with diabetes? YES  NO

If Yes, please explain:

Age at diagnosis \_\_\_\_\_

Have you been diagnosed with pre-diabetes? YES  NO

If Yes, please explain:

Age at diagnosis \_\_\_\_\_

**5. TOBACCO/ALCOHOL HISTORY (check one)**

**TOBACCO USE**

None   
 Quit  (when) \_\_\_\_\_  
 Cigarette   
 Cigar   
 Pipe   
 Chew Tobacco   
 \_\_\_\_\_  
 Snuff

**CURRENT**

(if applicable)  
**# per day**  
 Cigarette \_\_\_\_\_  
 Cigar \_\_\_\_\_  
 Pipe \_\_\_\_\_  
 Chew Tobacco \_\_\_\_\_  
 Snuff \_\_\_\_\_

Total years of tobacco use \_\_\_\_\_

Do you consume alcohol? Drinks per day \_\_\_\_ Drinks per week \_\_\_\_

**6. EDUCATION**

Please check the highest degree obtained:

Grade School   
 Junior High   
 High School   
 College Degree

Master's Degree   
Doctorate

## 7. EXERCISE

### How many times per week on average did you do the following kinds of exercise OVER THE PAST MONTH?

When answering these questions please:

- consider your weekly average over the past month.
- only count exercise sessions that lasted 10 minutes or longer in duration.
- only count exercise that was done during free time (i.e., not occupation or housework).
- note that the main difference between the three categories is the intensity of the exercise.

1. Thinking about MILD EXERCISE (MINIMAL EFFORT, NO PERSPIRATION)  
(e.g., easy walking, yoga, archery, fishing, bowling, lawn bowling, shuffleboard, horseshoes, golf, snowmobiling)

- a. How many times per week do you do MILD EXERCISE? \_\_\_\_\_
- b. How many minutes each time? \_\_\_\_\_

2. Thinking about MODERATE EXERCISE (NOT EXHAUSTING, LIGHT PERSPIRATION)  
(e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

- a. How many times per week do you do MODERATE EXERCISE? \_\_\_\_\_
- b. How many minutes each time? \_\_\_\_\_

3. Thinking about STRENUOUS EXERCISE (when your HEART BEATS RAPIDLY, SWEATING)  
(e.g., running, jogging, hockey, soccer, squash, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling, vigorous aerobic dance classes, heavy weight training)

- a. How many times per week do you do STRENUOUS EXERCISE? \_\_\_\_\_
- b. How many minutes each time? \_\_\_\_\_

4. Thinking about exercises to **increase muscle strength**, such as lifting weights or calisthenics.

- a. How many times per week do you do exercises to increase muscle strength? \_\_\_\_\_
- b. How many minutes each time? \_\_\_\_\_

5. Thinking about the time you spend **sitting at work, at home, while doing course work and during your leisure time**. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television. Answer to the closest quarter of an hour (e.g., 10.25 hours).

a. How many hours do you spend sitting on a typical weekday? \_\_\_\_\_

b. How many hours do you spend sitting on a typical weekend day? \_\_\_\_\_

8. HEIGHT \_\_\_\_\_ WEIGHT \_\_\_\_\_ LBS BMI \_\_\_\_\_ (RESEARCH STAFF TO COMPLETE)

9. **FAMILY PHYSICIAN**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

## Semi-Structured VA Patient Focus Group Script

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**Interview Leader (introduce researchers):** Thank you for participating in our focus group study! We are interested in hearing your thoughts about a program that we are considering offering at the Salem VA. The program is called “Resist Diabetes”, and it is a strength training exercise program developed to reduce diabetes risk. The Resist Diabetes strength training program was developed for adults with prediabetes. We would like to offer this program to Salem VAMC patients with prediabetes.

We would like to ask you a few questions, to learn more about your thoughts and experiences, and your opinions about this program. We’d like to give everyone a chance to respond to each question. There are no right or wrong answers – we are interested in your views.

Q1. What do **you** know about prediabetes? [Characteristics of Individuals; Knowledge & Beliefs about the Intervention]

- You stated you know \_\_\_\_\_ about prediabetes. Tell me more about \_\_\_\_\_?

Q2. If you have been diagnosed with **prediabetes**, how were **you** informed about the diagnosis? [Characteristics of Individuals; Knowledge & Beliefs about the Intervention]

- **Probes:** Feelings, Content of dx, Remember/Recall? Who?
- **Prompt:** Is there anything that \_\_\_\_ could have said differently when they told you about your dx?

Q3. Tell me about **your** participation in a: weight management, exercise or diabetes prevention program at the Salem VAMC? [Characteristics of Individuals; Relative Advantage]

- **You Have/Have Not Participated**
- **Probes: Any others?**

Q3 (a) What did you **like** about the program?

- **Can you expand on \_\_\_\_\_? Tell me more about \_\_\_\_\_?**

Q3 (b) What did you **not like** about the program?

- **Probes: Aspects, Frequency of visits, Duration, location?**
- **What would you change about \_\_\_\_\_ program to make you attend?**

Q4. To what extent do you believe the Salem VAMC needs a diabetes prevention program? [Inner Setting; Implementation climate]

- **You DO/DO Not believe the VA needs a DM prevention program.**
- **Probes: Can you expand on \_\_\_\_\_? Tell me more about \_\_\_\_\_?**

Q4 (a) Why do you think Salem VAMC need a diabetes prevention program?

- You believe the Salem VAMC needs a diabetes prevention program because \_\_\_\_\_. Can you expand on this? Tell me more about\_\_\_\_\_.

Q4 (b) Why do you think Salem VAMC does not need a diabetes prevention program?

- You believe the Salem VAMC does not need a diabetes prevention program because \_\_\_\_\_. Can you expand on this? Tell me more about\_\_\_\_\_.

Q5. How do **you** typically find about new programs at the Salem VAMC? [Inner Setting; Network and Communications/Process; Engaging]

- Probes: flyers, emails, word of mouth, staff/doctor referrals, mobile apps
- Can you expand on \_\_\_\_\_? Frequency? Duration/length? Content?
- Why does \_\_\_\_\_ work?

Q6. What communication methods are most effective for reaching **other** VA patients? [Inner Setting; Network and Communications/ Process; Engaging]

- Probes: flyers, emails, word of mouth, staff/doctor referrals, mobile apps
- Can you expand on \_\_\_\_\_? Frequency? Duration/Length? Content?

Q6 (a). Why are those methods most effective?

- Probes: duration, length, content.

- Describe the ideal method of communication for other vets?

The Resist Diabetes program was previously delivered to older, overweight sedentary people with prediabetes living in the Roanoke area. The researchers found that this exercise program reduced the prevalence of prediabetes by about one-third, and improved muscle strength, muscle mass and blood pressure. Participants in this program completed strength training sessions two times per week, with each session lasting 45-60 min. The training sessions were supervised by a personal trainer (one on one, or one trainer for two participants). We would like to offer this program at the Salem VAMC's onsite fitness facility. The strength training program consists of 12 full body, muscle strengthening exercises, using muscle strength training equipment. The program starts with a 12-week phase, so that participants could learn proper form and technique with the personal trainers. After 12 weeks, participants would transition to training without the trainer at the Salem VAMC fitness facility, two times per week.

Q7. Based on that description, what do **you** think the Resist Diabetes program offers?

Q8. How **confident** do you feel about **your** ability to complete the Resist Diabetes program (attending RT sessions 2x per week for 12 weeks, completing 12 RT exercises, then training on your own after that)? [Characteristics of Individuals; Self Efficacy]

- You feel confident in \_\_\_\_\_? Why are you confident about this?

Q8 (a).What aspects of the program do **you** feel confident about?

- You feel confident about \_\_\_\_\_, can you expand on this?

Q8 (b). What aspects of the program do **you** feel **less confident** about?

- You do not feel confident about \_\_\_\_\_? What would make you feel more confident in them?

Q9. What **barriers** do you think might prevent **you** from participating in a program like Resist Diabetes? [Outer Setting; Patient Need and Resources]

- Probes: Time, Frequency, duration, exercise program

Q10. What features of this program are most appealing to you? [Intervention Characteristics; Adaptability]

- You described \_\_\_\_\_ as most appealing, can you expand on this? Why are these characteristics important to you?

Q11. What features are least appealing to you? [Intervention Characteristics; Adaptability]

- You described \_\_\_\_\_ as least appealing, can you expand on this? What would make them more appealing to you?

Q12. What format of training with a personal trainer **would you prefer**: One-on-one or Group-based? [Intervention Characteristics; Adaptability]

- Probes: Group based: how many? Same group or New people? Same instructor?
- What do you the ideal instructor would be like?

Q12(a): Why is that the format most appealing to you?

- What would it take for you to attend the *opposite*? How could \_\_\_\_\_ be more appealing? Hybrid class?

Q13. Does the Salem VAMC provide any resources that makes participating in programs like this one at the Salem VAMC easier to attend? [Outer Setting; Patient Need and Resources]

- Probes: transportation, information, scheduling help
- Tell about more about \_\_\_\_\_?

Q14. Have you heard about the onsite fitness facility at the Salem VAMC? [Outer Setting; Patient Need and Resources]

- Probes: Feeling, accessibility, knowledge,

\*Share any body language in notes:

Q15. Would you be interested in participating in a program like Resist Diabetes? [Characteristics of Individuals; Individual Stage of Change]

- Can you expand on your interest?

Q15 (a) Why would you be interested?

- You are interested in Resist Diabetes because \_\_\_\_\_. Tell me more about why \_\_\_\_\_ makes you interested?

Q15 (b) Why would you not be interested?

- What changes to \_\_\_\_\_ would make you interested?

Q16: Please describe the degree to which you think other Salem VAMC patients would be interested in Resist Diabetes? [Characteristics of Individuals; Individual Stage of Change]

Any other comments? Thank you for taking part in this study!

## CFIR Codebook

Note: This template provides inclusion and exclusion criteria for most constructs. Please post additional inclusion and exclusion criteria, guidance, or questions to the [CFIR Wiki](#) discussion tab in order to help improve the CFIR.

This template only includes CFIR definitions and coding criteria; codebooks may include other information, such as examples of coded text, rating guidelines, and related interview questions.

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### I. Innovation Characteristics

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A. Innovation Source      Definition: Perception of key stakeholders about whether the innovation is externally or internally developed.

Inclusion Criteria: Include statements about the source of the innovation and the extent to which interviewees view the change as internal to the organization, e.g., an internally developed program, or external to the organization, e.g., a program coming from the outside. Note: May code and rate as "I" for internal or "E" for external.

Exclusion Criteria: Exclude or double code statements related to who participated in the decision process to implement the innovation to [Engaging](#), as an indication of early (or late) engagement. Participation in decision-making is an effective engagement strategy to help people feel ownership of the innovation.

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B. Evidence Strength & Quality      Definition: Stakeholders' perceptions of the quality and validity of evidence supporting the belief that the innovation will have desired outcomes.

Inclusion Criteria: Include statements regarding awareness of evidence and the strength and quality of evidence, as well as the absence of evidence or a desire for different types of evidence, such as pilot results instead of evidence from the literature.

Exclusion Criteria: Exclude or double code statements regarding the receipt of evidence as an engagement strategy to [Engaging: Key Stakeholders](#).

Exclude or double code descriptions of use of results from local or regional pilots to [Trialability](#).

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C. Relative Advantage      Definition: Stakeholders' perception of the advantage of implementing the innovation versus an alternative solution.

Inclusion Criteria: Include statements that demonstrate the innovation is better (or worse) than existing programs.

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	<p><u>Exclusion Criteria:</u> Exclude statements that demonstrate a strong need for the innovation and/or that the current situation is untenable and code to <a href="#">Tension for Change</a>.</p>
D. Adaptability	<p><u>Definition:</u> The degree to which an innovation can be adapted, tailored, refined, or reinvented to meet local needs.</p> <p><u>Inclusion Criteria:</u> Include statements regarding the (in)ability to adapt the innovation to their context, e.g., complaints about the rigidity of the protocol. Suggestions for improvement can be captured in this code but should not be included in the rating process, unless it is clear that the participant feels the change is needed but that the program cannot be adapted. However, it may be possible to infer that a large number of suggestions for improvement demonstrates lack of compatibility, see exclusion criteria below.</p> <p><u>Exclusion Criteria:</u> Exclude or double code statements that the innovation did or did not need to be adapted to <a href="#">Compatibility</a>.</p>
E. Trialability	<p><u>Definition:</u> The ability to test the innovation on a small scale in the organization, and to be able to reverse course (undo implementation) if warranted.</p> <p><u>Inclusion Criteria:</u> Include statements related to whether the site piloted the innovation in the past or has plans to in the future, and comments about whether they believe it is (im)possible to conduct a pilot.</p> <p><u>Exclusion Criteria:</u> Exclude or double code descriptions of use of results from local or regional pilots to <a href="#">Evidence Strength &amp; Quality</a>.</p>
F. Complexity	<p><u>Definition:</u> Perceived difficulty of the innovation, reflected by duration, scope, radicalness, disruptiveness, centrality, and intricacy and number of steps required to implement.</p> <p><u>Inclusion Criteria:</u> Code statements regarding the complexity of the innovation itself.</p> <p><u>Exclusion Criteria:</u> Exclude statements regarding the complexity of implementation and code to the appropriate CFIR code, e.g., difficulties related to space are coded to Available Resources and difficulties related to engaging participants in a new program are coded to <a href="#">Engaging: Innovation Participants</a>.</p>
G. Design Quality & Packaging	<p><u>Definition:</u> Perceived excellence in how the innovation is bundled, presented, and assembled.</p> <p><u>Inclusion Criteria:</u> Include statements regarding the quality of the materials and packaging.</p>

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Exclusion Criteria: Exclude statements regarding the presence or absence of materials and code to [Available Resources](#).

Exclude statements regarding the receipt of materials as an engagement strategy and code to [Engaging](#).

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H. Cost

Definition: Costs of the innovation and costs associated with implementing the innovation including investment, supply, and opportunity costs.

Inclusion Criteria: Include statements related to the cost of the innovation and its implementation.

Exclusion Criteria: Exclude statements related to physical space and time, and code to [Available Resources](#). In a research study, exclude statements related to costs of conducting the research components (e.g., funding for research staff, participant incentives).

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## II. Outer Setting

A. Needs & Resources of Those Served by the Organization

Definition: The extent to which the needs of those served by the organization (e.g., patients), as well as barriers and facilitators to meet those needs, are accurately known and prioritized by the organization.

Inclusion Criteria: Include statements demonstrating (lack of) awareness of the needs and resources of those served by the organization. Analysts may be able to infer the level of awareness based on statements about: 1. Perceived need for the innovation based on the needs of those served by the organization and if the innovation will meet those needs; 2. Barriers and facilitators of those served by the organization to participating in the innovation; 3. Participant feedback on the innovation, i.e., satisfaction and success in a program. In addition, include statements that capture whether or not awareness of the needs and resources of those served by the organization influenced the implementation or adaptation of the innovation.

Exclusion Criteria: Exclude statements that demonstrate a strong need for the innovation and/or that the current situation is untenable and code to [Tension for Change](#).

Exclude statements related to engagement strategies and outcomes, e.g., how innovation participants became engaged with the innovation, and code to [Engaging](#): Innovation Participants.

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B. Cosmopolitanism

Definition: The degree to which an organization is networked with other external organizations.

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	<p><u>Inclusion Criteria:</u> Include descriptions of outside group memberships and networking done outside the organization.</p> <p><u>Exclusion Criteria:</u> Exclude statements about general networking, communication, and relationships in the organization, such as descriptions of meetings, email groups, or other methods of keeping people connected and informed, and statements related to team formation, quality, and functioning, and code to <a href="#">Networks &amp; Communications</a>.</p>
C. Peer Pressure	<p><u>Definition:</u> Mimetic or competitive pressure to implement an innovation, typically because most or other key peer or competing organizations have already implemented or are in a bid for a competitive edge.</p> <p><u>Inclusion Criteria:</u> Include statements about perceived pressure or motivation from other entities or organizations in the local geographic area or system to implement the innovation.</p> <p><u>Exclusion Criteria:</u></p>
D. External Policy & Incentives	<p><u>Definition:</u> A broad construct that includes external strategies to spread innovations including policy and regulations (governmental or other central entity), external mandates, recommendations and guidelines, pay-for-performance, collaboratives, and public or benchmark reporting.</p> <p><u>Inclusion Criteria:</u> Include descriptions of external performance measures from the system.</p> <p><u>Exclusion Criteria:</u></p>
<b>III. Inner Setting</b>	
A. Structural Characteristics	<p><u>Definition:</u> The social architecture, age, maturity, and size of an organization.</p> <p><u>Inclusion Criteria:</u></p> <p><u>Exclusion Criteria:</u></p>
B. Networks & Communications	<p><u>Definition:</u> The nature and quality of webs of social networks, and the nature and quality of formal and informal communications within an organization.</p> <p><u>Inclusion Criteria:</u> Include statements about general networking, communication, and relationships in the organization, such as descriptions of meetings, email groups, or other methods of keeping people connected and informed, and statements related to team formation, quality, and functioning.</p>

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Exclusion Criteria: Exclude statements related to implementation leaders' and users' access to knowledge and information regarding using the program, i.e., training on the mechanics of the program and code to [Access to Knowledge & Information](#).

Exclude statements related to engagement strategies and outcomes, e.g., how key stakeholders became engaged with the innovation and what their role is in implementation, and code to [Engaging: Key Stakeholders](#).

Exclude descriptions of outside group memberships and networking done outside the organization and code to [Cosmopolitanism](#).

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C. Culture

Definition: Norms, values, and basic assumptions of a given organization.

Inclusion Criteria: Inclusion criteria, and potential sub-codes, will depend on the framework or definition used for “culture.” For example, if using the [Competing Values Framework](#) (CVF), you may include four sub-codes related to the four dimensions of the CVF and code statements regarding one or more of the four dimension in an organization.

Exclusion Criteria:

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D. Implementation  
Climate

Definition: The absorptive capacity for change, shared receptivity of involved individuals to an innovation, and the extent to which use of that innovation will be rewarded, supported, and expected within their organization.

Inclusion Criteria: Include statements regarding the general level of receptivity to implementing the innovation.

Exclusion Criteria: Exclude statements regarding the general level of receptivity that are captured in the sub-codes.

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1. Tension for  
Change

Definition: The degree to which stakeholders perceive the current situation as intolerable or needing change.

Inclusion Criteria: Include statements that (do not) demonstrate a strong need for the innovation and/or that the current situation is untenable, e.g., statements that the innovation is absolutely necessary or that the innovation is redundant with other programs. Note: If a participant states that the innovation is redundant with a preferred existing program, (double) code lack of [Relative Advantage](#), see exclusion criteria below.

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Exclusion Criteria: Exclude statements regarding specific needs of individuals that demonstrate a need for the innovation, but do not necessarily represent a strong need or an untenable status quo, and code to [Needs and Resources of Those Served by the Organization](#).

Exclude statements that demonstrate the innovation is better (or worse) than existing programs and code to [Relative Advantage](#).

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2. Compatibility

Definition: The degree of tangible fit between meaning and values attached to the innovation by involved individuals, how those align with individuals' own norms, values, and perceived risks and needs, and how the innovation fits with existing workflows and systems.

Inclusion Criteria: Include statements that demonstrate the level of compatibility the innovation has with organizational values and work processes. Include statements that the innovation did or did not need to be adapted as evidence of compatibility or lack of compatibility.

Exclusion Criteria: Exclude or double code statements regarding the priority of the innovation based on compatibility with organizational values to [Relative Priority](#), e.g., if an innovation is not prioritized because it is not compatible with organizational values.

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3. Relative Priority

Definition: Individuals' shared perception of the importance of the implementation within the organization.

Inclusion Criteria: Include statements that reflect the relative priority of the innovation, e.g., statements related to change fatigue in the organization due to implementation of many other programs.

Exclusion Criteria: Exclude or double code statements regarding the priority of the innovation based on compatibility with organizational values to [Compatibility](#), e.g., if an innovation is not prioritized because it is not compatible with organizational values.

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4. Organizational  
Incentives &  
Rewards

Definition: Extrinsic incentives such as goal-sharing, awards, performance reviews, promotions, and raises in salary, and less tangible incentives such as increased stature or respect.

Inclusion Criteria: Include statements related to whether organizational incentive systems are in place to foster (or hinder) implementation, e.g., rewards or disincentives for staff engaging in the innovation.

Exclusion Criteria:

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<p>5. Goals &amp; Feedback</p>	<p><u>Definition:</u> The degree to which goals are clearly communicated, acted upon, and fed back to staff, and alignment of that feedback with goals.</p> <p><u>Inclusion Criteria:</u> Include statements related to the (lack of) alignment of implementation and innovation goals with larger organizational goals, as well as feedback to staff regarding those goals, e.g., regular audit and feedback showing any gaps between the current organizational status and the goal. Goals and Feedback include organizational processes and supporting structures independent of the implementation process. Evidence of the integration of evaluation components used as part of “Reflecting and Evaluating” into <b>on-going or sustained</b> organizational structures and processes may be (double) coded to Goals and Feedback.</p> <p><u>Exclusion Criteria:</u> Exclude statements that refer to the implementation team’s (lack of) assessment of the progress toward and impact of implementation, as well as the interpretation of outcomes related to implementation, and code to <a href="#">Reflecting &amp; Evaluating</a>. Reflecting and Evaluating is part of the implementation process; it likely ends when implementation activities end. It does not require goals be explicitly articulated; it can focus on descriptions of the current state with real-time judgment, though there may be an implied goal (e.g., we need to implement the innovation) when the implementation team discusses feedback in terms of adjustments needed to complete implementation.</p>
<p>6. Learning Climate</p>	<p><u>Definition:</u> A climate in which: 1. Leaders express their own fallibility and need for team members’ assistance and input; 2. Team members feel that they are essential, valued, and knowledgeable partners in the change process; 3. Individuals feel psychologically safe to try new methods; and 4. There is sufficient time and space for reflective thinking and evaluation.</p> <p><u>Inclusion Criteria:</u> Include statements that support (or refute) the degree to which key components of an organization exhibit a “learning climate.”</p> <p><u>Exclusion Criteria:</u></p>
<p>E. Readiness for Implementation</p>	<p><u>Definition:</u> Tangible and immediate indicators of organizational commitment to its decision to implement an innovation.</p> <p><u>Inclusion Criteria:</u> Include statements regarding the general level of readiness for implementation.</p> <p><u>Exclusion Criteria:</u> Exclude statements regarding the general level of readiness for implementation that are captured in the sub-codes.</p>

1. Leadership Engagement	<p><u>Definition:</u> Commitment, involvement, and accountability of leaders and managers with the implementation of the innovation.</p>
	<p><u>Inclusion Criteria:</u> Include statements regarding the level of engagement of organizational leadership.</p>
	<p><u>Exclusion Criteria:</u> Exclude or double code statements regarding leadership engagement to Engaging: <a href="#">Formally Appointed Internal Implementation Leaders</a> or <a href="#">Champions</a> if an organizational leader is also an implementation leader, e.g., if a director of primary care takes the lead in implementing a new treatment guideline. Note that a key characteristic of this Implementation Leader/Champion is that s/he is also an Organizational Leader.</p>
2. Available Resources	<p><u>Definition:</u> The level of resources organizational dedicated for implementation and on-going operations including physical space and time.</p>
	<p><u>Inclusion Criteria:</u> Include statements related to the presence or absence of resources specific to the innovation that is being implemented.</p>
	<p><u>Exclusion Criteria:</u> Exclude statements related to training and education and code to <a href="#">Access to Knowledge &amp; Information</a>.</p>
	<p>Exclude statements related to the quality of materials and code to <a href="#">Design Quality &amp; Packaging</a>.</p>
	<p>In a research study, exclude statements related to resources needed for conducting the research components (e.g., time to complete research tasks, such as IRB applications, consenting patients).</p>
3. Access to Knowledge & Information	<p><u>Definition:</u> Ease of access to digestible information and knowledge about the innovation and how to incorporate it into work tasks.</p>
	<p><u>Inclusion Criteria:</u> Include statements related to implementation leaders' and users' access to knowledge and information regarding use of the program, i.e., training on the mechanics of the program.</p>
	<p><u>Exclusion Criteria:</u> Exclude statements related to engagement strategies and outcomes, e.g., how key stakeholders became engaged with the innovation and what their role is in implementation, and code to <a href="#">Engaging: Key Stakeholders</a>.</p>
	<p>Exclude statements about general networking, communication, and relationships in the organization, such as descriptions of meetings, email groups, or other methods of keeping people connected and</p>

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informed, and statements related to team formation, quality, and functioning, and code to [Networks & Communications](#).

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#### **IV. Characteristics of Individuals**

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1. Knowledge & Beliefs about the Innovation
- Definition: Individuals' attitudes toward and value placed on the innovation, as well as familiarity with facts, truths, and principles related to the innovation.

Inclusion Criteria:

Exclusion Criteria: Exclude statements related to familiarity with evidence about the innovation and code to [Evidence Strength & Quality](#).

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2. Self-efficacy
- Definition: Individual belief in their own capabilities to execute courses of action to achieve implementation goals.

Inclusion Criteria:

Exclusion Criteria:

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3. Individual Stage of Change
- Definition: Characterization of the phase an individual is in, as s/he progresses toward skilled, enthusiastic, and sustained use of the innovation.

Inclusion Criteria:

Exclusion Criteria:

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4. Individual Identification with Organization
- Definition: A broad construct related to how individuals perceive the organization, and their relationship and degree of commitment with that organization.

Inclusion Criteria:

Exclusion Criteria:

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5. Other Personal Attributes
- Definition: A broad construct to include other personal traits such as tolerance of ambiguity, intellectual ability, motivation, values, competence, capacity, and learning style.

Inclusion Criteria:

Exclusion Criteria:

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#### **V. Process**

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- A. Planning
- Definition: The degree to which a scheme or method of behavior and tasks for implementing an innovation are developed in advance, and the quality of those schemes or methods.
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	<p><u>Inclusion Criteria:</u> Include evidence of pre-implementation diagnostic assessments and planning, as well as refinements to the plan.</p>
	<p><u>Exclusion Criteria:</u></p>
B. Engaging	<p><u>Definition:</u> Attracting and involving appropriate individuals in the implementation and use of the innovation through a combined strategy of social marketing, education, role modeling, training, and other similar activities.</p> <p><u>Inclusion Criteria:</u> Include statements related to engagement strategies and outcomes, i.e., if and how staff and innovation participants became engaged with the innovation and what their role is in implementation. Note: Although both strategies and outcomes are coded here, the outcome of engagement efforts determines the rating, i.e., if there are repeated attempts to engage staff that are unsuccessful, or if a role is vacant, the construct receives a negative rating. In addition, you may also want to code the "quality" of staff - their capabilities, motivation, and skills, i.e., how good they are at their job, and this data affects the rating as well.</p> <p><u>Exclusion Criteria:</u> Exclude statements related to specific sub constructs, e.g., <a href="#">Champions</a> or <a href="#">Opinion Leaders</a>.</p> <p>Exclude or double code statements related to who participated in the decision process to implement the innovation to <a href="#">Innovation Source</a>, as an indicator of internal or external innovation source.</p>
1. Opinion Leaders	<p><u>Definition:</u> Individuals in an organization that have formal or informal influence on the attitudes and beliefs of their colleagues with respect to implementing the innovation.</p> <p><u>Inclusion Criteria:</u> Include statements related to engagement strategies and outcomes, e.g., how the opinion leader became engaged with the innovation and what their role is in implementation. Note: Although both strategies and outcomes are coded here, the outcome of efforts to engage staff determines the rating, i.e., if there are repeated attempts to engage an opinion leader that are unsuccessful, or if the opinion leader leaves the organization and this role is vacant, the construct receives a negative rating. In addition, you may also want to code the "quality" of the opinion leader here - their capabilities, motivation, and skills, i.e., how good they are at their job, and this data affects the rating as well.</p> <p><u>Exclusion Criteria:</u></p>
2. Formally Appointed Internal	<p><u>Definition:</u> Individuals from within the organization who have been formally appointed with responsibility for implementing an</p>

Implementation Leaders	<p>innovation as coordinator, project manager, team leader, or other similar role.</p> <p><u>Inclusion Criteria:</u> Include statements related to engagement strategies and outcomes, e.g., how the formally appointed internal implementation leader became engaged with the innovation and what their role is in implementation. Note: Although both strategies and outcomes are coded here, the outcome of efforts to engage staff determines the rating, i.e., if there are repeated attempts to engage an implementation leader that are unsuccessful, or if the implementation leader leaves the organization and this role is vacant, the construct receives a negative rating. In addition, you may also want to code the "quality" of the implementation leader here - their capabilities, motivation, and skills, i.e., how good they are at their job, and this data affects the rating as well.</p> <p><u>Exclusion Criteria:</u> Exclude or double code statements regarding leadership engagement to <a href="#">Leadership Engagement</a> if an implementation leader is also an organizational leader, e.g., if a director of primary care takes the lead in implementing a new treatment guideline.</p>
3. Champions	<p><u>Definition:</u> "Individuals who dedicate themselves to supporting, marketing, and 'driving through' an [implementation]", overcoming indifference or resistance that the innovation may provoke in an organization.</p> <p><u>Inclusion Criteria:</u> Include statements related to engagement strategies and outcomes, e.g., how the champion became engaged with the innovation and what their role is in implementation. Note: Although both strategies and outcomes are coded here, the outcome of efforts to engage staff determines the rating, i.e., if there are repeated attempts to engage a champion that are unsuccessful, or if the champion leaves the organization and this role is vacant, the construct receives a negative rating. In addition, you may also want to code the "quality" of the champion here - their capabilities, motivation, and skills, i.e., how good they are at their job, and this data affects the rating as well.</p> <p><u>Exclusion Criteria:</u> Exclude or double code statements regarding leadership engagement to <a href="#">Leadership Engagement</a> if a champion is also an organizational leader, e.g., if a director of primary care takes the lead in implementing a new treatment guideline.</p>
4. External Change Agents	<p><u>Definition:</u> Individuals who are affiliated with an outside entity who formally influence or facilitate innovation decisions in a desirable direction.</p>

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Inclusion Criteria: Include statements related to engagement strategies and outcomes, e.g., how the external change agent (entities outside the organization that facilitate change) became engaged with the innovation and what their role is in implementation, e.g., how they supported implementation efforts. Note: Although both strategies and outcomes are coded here, the outcome of efforts to engage staff determines the rating, i.e., if there are repeated attempts to engage an external change agent that are unsuccessful, or if the external change agent leaves their organization and this role is vacant, the construct receives a negative rating. In addition, you may also want to code the "quality" of the external change agent here - their capabilities, motivation, and skills, i.e., how good they are at their job, and this data affects the rating as well.

Exclusion Criteria: Note: It is important to clearly define what roles are external and internal to the organization. Exclude statements regarding facilitating activities, such as training in the mechanics of the program, and code to [Access to Knowledge & Information](#) if the change agent is considered internal to the study, e.g., a staff member at the national office. If the study considers this staff member internal to the organization, it should be coded to [Access to Knowledge & Information](#), even though their support may overlap with what would be expected from an External Change Agent.

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5. Key Stakeholders

Definition: Individuals from within the organization that are directly impacted by the innovation, e.g., staff responsible for making referrals to a new program or using a new work process.

Inclusion Criteria: Include statements related to engagement strategies and outcomes, e.g., how key stakeholders became engaged with the innovation and what their role is in implementation. Note: Although both strategies and outcomes are coded here, the outcome of efforts to engage staff determines the rating, i.e., if there are repeated attempts to engage key stakeholders that are unsuccessful, the construct receives a negative rating.

Exclusion Criteria: Exclude statements related to implementation leaders' and users' access to knowledge and information regarding using the program, i.e., training on the mechanics of the program, and code to [Access to Knowledge & Information](#).

Exclude statements about general networking, communication, and relationships in the organization, such as descriptions of meetings, email groups, or other methods of keeping people connected and

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	informed, and statements related to team formation, quality, and functioning, and code to <a href="#">Networks &amp; Communications</a> .
6. Innovation Participants	<p><b>Definition:</b> Individuals served by the organization that participate in the innovation, e.g., patients in a prevention program in a hospital.</p> <p><b>Inclusion Criteria:</b> Include statements related to engagement strategies and outcomes, e.g., how innovation participants became engaged with the innovation. Note: Although both strategies and outcomes are coded here, the outcome of efforts to engage participants determines the rating, i.e., if there are repeated attempts to engage participants that are unsuccessful, the construct receives a negative rating.</p> <p><b>Exclusion Criteria:</b> Exclude statements demonstrating (lack of) awareness of the needs and resources of those served by the organization and whether or not that awareness influenced the implementation or adaptation of the innovation and code to <a href="#">Needs &amp; Resources of Those Served by the Organization</a>.</p>
C. Executing	<p><b>Definition:</b> Carrying out or accomplishing the implementation according to plan.</p> <p><b>Inclusion Criteria:</b> Include statements that demonstrate how implementation occurred with respect to the implementation plan. Note: Executing is coded very infrequently due to a lack of planning. However, some studies have used fidelity measures to assess executing, as an indication of the degree to which implementation was accomplished according to plan.</p> <p><b>Exclusion Criteria:</b></p>
D. Reflecting & Evaluating	<p><b>Definition:</b> Quantitative and qualitative feedback about the progress and quality of implementation accompanied with regular personal and team debriefing about progress and experience.</p> <p><b>Inclusion Criteria:</b> Include statements that refer to the implementation team's (lack of) assessment of the progress toward and impact of implementation, as well as the interpretation of outcomes related to implementation. Reflecting and Evaluating is part of the implementation process; it likely ends when implementation activities end. It does not require goals be explicitly articulated; it can focus on descriptions of the current state with real-time judgment, though there may be an implied goal (e.g., we need to implement the innovation) when the implementation team discusses feedback in terms of adjustments needed to complete implementation.</p>

Exclusion Criteria: Exclude statements related to the (lack of) alignment of implementation and innovation goals with larger organizational goals, as well as feedback to staff regarding those goals, e.g., regular audit and feedback showing any gaps between the current organizational status and the goal, and code to [Goals & Feedback](#). Goals and Feedback include organizational processes and supporting structures independent of the implementation process. Evidence of the integration of evaluation components used as part of “Reflecting and Evaluating” into **on-going or sustained** organizational structures and processes may be (double) coded to Goals and Feedback.

Exclude statements that capture reflecting and evaluating that participants may do during the interview, for example, related to the success of the implementation, and code to [Knowledge & Beliefs about the Innovation](#).

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## VI. Additional Codes

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A. Code Name      Definition:

Inclusion Criteria:

Exclusion Criteria:

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B. Code Name      Definition:

Inclusion Criteria:

Exclusion Criteria:

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### General Coding Rules:

When two codes are in question for a passage, consider the primary meaning of the passage to assign code; consider what the participant is truly saying. Analysts may wish to err on the side of inclusion or double coding.

### General Rating Rules:

Ratings						
M	-2	-1	0	X	+1	+2

In general, ratings are determined based on two factors: 1) valence and 2) strength.

### Valence: positive or negative influence on implementation

*Rating component: X, 0, +, -*

The valence component of a rating is determined by the influence the coded data has on the implementation process, i.e., contextual factors that facilitate or hinder implementation. Due to limited data, analysts may have to infer the influence on implementation based on simple presence or absence of a construct. For example, if a participant states that the intervention has

advantages over existing programs, but does not state how this has influenced implementation, the analyst can infer that the presence of relative advantage facilitated implementation. However, whenever the data allows, the analysts should apply ratings based on the influence the construct has on implementation, not the presence or absence of a construct; presence or absence of a positive construct (e.g. relative advantage) does not always constitute a matching positive or negative influence on implementation.

In the event that comments are mixed, i.e., some comments are negative and some comments are positive, try to tip the rating to a weak positive or weak negative, based on the aggregate of the comments. However, if you feel the comments are equally positive and negative, apply a mixed (X) rating. Some users of the CFIR have denoted level of agreement among participants in their rating by adding a \* to the rating if comments were mixed. For example, if the aggregate of mixed comments was positive, the rating was +1\*. Some users feel it's important to record discord among participants because it indicates a negative influence on implementation.

In the event that the comments are neutral, i.e., comments are related to a construct but have no bearing on the implementation, apply the neutral (0) rating.

**Strength: weak or strong influence on implementation**

*Rating component: 1, 2*

The strength component of a rating is determined by a number of factors, including: level of agreement among participants, strength of language, and use of concrete examples. However, sometimes analysts may choose to apply relative ratings, versus absolute ratings, in order to differentiate between organization in the study.

*Appendix XII (Excel)*

<b>State</b>	<b>Medical Center</b>	<b>Contact</b>	<b>Gym (Y/N)</b>	<b>Access</b>
<b>Alabama</b>	Birmingham Medical Center	205-933-8101	N	
<b>Alabama</b>	Central Alabama Veterans Health Care System West/East Campus	334-272-4670		
<b>Alabama</b>	Tuscaloosa VA Medical Center	205-554-2000	Y	
<b>Alaska</b>	Alaska VA Healthcare System	907-257-4700   888-353-7574		
<b>Arizona</b>	Phoenix VA Health Care System	602-277-5551   800-554-7174	Y	Employee and patients
<b>Arizona</b>	Northern Arizona VA Health Care System	928-445-4860   800-949-1005	Y	Employee access; Recreational therapy access only for veterans
<b>Arizona</b>	Southern Arizona VA Health Care System			
<b>Arkansas</b>	Veterans Health Care System of the Ozarks	479-443-4301   800-691-8387	N	
<b>Arkansas</b>	Central Arkansas Veterans Healthcare System Eugene J. Towbin Healthcare Center/ Central Arkansas Veterans Healthcare System John L McMlellan	501-257-1000	Y: Rec Room	Veterans and Employees
<b>California</b>	San Francisco VA Health Care System	415-221-4810   877-487-2838	N	
<b>California</b>	Central California VA Health Care System: Fresno VA Medical Center	559-225-6100	Y	Only for PT : mostly machines and some light free weights
<b>California</b>	VA Palo Alto Healthcare System	650-493-5000	Y	Only for PT: no open gyms
<b>California</b>	Palo Alto VA Healthcare System: Livermore Division	925-373-4700	N: pool facility with lobby equipment (treadmill and stationary bike)	veterans with consult
<b>California</b>	Palo Alto VA Healthcare System: Menlo Park Division	650-614-9997	Y	one gym for veterans, one gym for employees
<b>California</b>	VA Loma Linda Healthcare System	909-825-7084   800-741-8387	Y	PT pts only : strength classes offered (new initiative)
<b>California</b>	VA Long Beach Healthcare System	562-826-8000   888-769-8387	Y	Employees Only
<b>California</b>	VA Greater Los Angeles Healthcare System	310-478-3711		

<b>California</b>	VA Northern California Health Care System: Sacramento	916-843-7000   855-771-9321	Y	
<b>California</b>	VA San Diego Healthcare System	858-552-8585   800-331-8387		
<b>Colorado</b>	VA Eastern Colorado Healthcare System: Denver	303-399-8020	N	
<b>Colorado</b>	Grand Junction VA Western Colorado Healthcare System	970-242-0731   866-206-6415		
<b>Connecticut</b>	VA Connecticut Healthcare System: Newington Campus	860-666-6951	Y	Employees Only
<b>Connecticut</b>	VA Connecticut Healthcare System: West Haven Campus	203-932-5711	Y	Veterans with consult
<b>Delaware</b>	Wilmington VA Medical Center	302-994-2511	N	
<b>D.C.</b>	Washington DC VA Medical Center	202-745-8000   877-328-2621	Y	with consult; veterans and employees but at different times
<b>Florida</b>	Bay Pines VA Healthcare System/ Lee County VA Healthcare Center and Southern Clinics	888-820-0230   888-513-0045	Y	for veterans
<b>Florida</b>	Malcom Randall VAMC, NF/SGVHS	352-376-1611   800-324-8387	Y	
<b>Florida</b>	Lake City VAMC	386-755-3016   800-308-8387	Y	
<b>Florida</b>	Miami VA Healthcare System	305-575-7000   888-276-1785	Y	veterans can use with consult
<b>Florida</b>	Orlando VA Medical Center	407-631-1000   800-922-7521	N	
<b>Florida</b>	James A Haley Veterans' Hospital; Tampa VA Medical Center	813-972-2000   888-716-7787	Y	employee gym area available, veterans can only use equipment with consult
<b>Florida</b>	West Palm Beach VAMC	561-422-8262   800-972-8262		
<b>Georgia</b>	Augusta VA Medical Center	706-733-0188	Y	
<b>Georgia</b>	Atlanta VA Medical Center	404-321-6111		
<b>Georgia</b>	Dublin VA Medical Center	478-272-1210		
<b>Hawaii</b>	Spark M. Matsunaga VA Medical Center	808-433-0600   800-214-1306		
<b>Idaho</b>	Boise VA Medical Center	208-422-1000	Y	open gym times: every day from 7:30-10:30 and anytime after 1:00

<b>Illinois</b>	Jesse Brown VA Medical Center	312-569-8387	Y	recreation/wellness consult needed ; employees also welcome
<b>Illinois</b>	Edward Hines, Jr. VA Hospital	708-202-8387		
<b>Illinois</b>	Marion VA Medical Center	618-997-5311	Y	Employee only on campus - Community agreement with local gym for veterans. Discount
<b>Illinois</b>	Captain James A. Lovell Federal Health Care Center	847-688-1900   800-393-0865		
<b>Illinois</b>	VA Illiana Health Care System	217-554-3000	Y	need physician consult, only specific programs are offered
<b>Indiana</b>	VA Northern Indiana Health Care System: Fort Wayne Campus	260-426-5431   800-360-8387	Y	Need physician for physical therapy only
<b>Indiana</b>	VA Northern Indiana Health Care System: Marion Campus	765-674-3321   800-360-8387		
<b>Indiana</b>	Richard L. Roudebush VA Medical Center	317-554-0000   317-988-1772		
<b>Iowa</b>	VA Central Iowa Health Care System; Des Moines	515-699-5999   800-294-8387	Y	one employee only gym & one patient/employee gym (employee)
<b>Iowa</b>	Iowa City VA Health Care System	319-338-0581   800-637-0128	N	
<b>Kansas</b>	VA Eastern Kansas Health Care System: Dwight D. Eisenhower VA Medical Center	913-682-2000   800-952-8387	Y	employee gym available
<b>Kansas</b>	VA Eastern Kansas Health Care System: Colmery-O'Neil VA Medical Center	785-350-3111   800-574-8387	Y	available with consult
<b>Kansas</b>	Robert J. Dole VA Medical Center	316-685-2221   888-878-6881	N	
<b>Kentucky</b>	Lexington VA Medical Center	859-233-4511		
<b>Kentucky</b>	Cincinnati VA Medical Center-Fort Thomas	859-572-6202	N	
<b>Kentucky</b>	Leestown Medical Center	859-233-4511	Y	veterans with supervision and employees after hours
<b>Kentucky</b>	Robley Rex VA Medical Center	502-287-4000   800-376-8387	Y	veterans through referral
<b>Louisiana</b>	Southeast Louisiana Veterans Health Care System	800-935-8387	Y	employee gym available - left a message asking about vet access

<b>Louisiana</b>	Alexandria VA Health Care System	318-466-4000   800-375-8387	Y	only for employees
<b>Louisiana</b>	Overton Brooks VA Medical Center; Shreveport	318-221-8411	Y	for veterans and employees
<b>Maine</b>	VA Maine Healthcare System	877-421-8263   207-623-8411	Y	
<b>Maryland</b>	Baltimore VA Medical Center	410-605-7000   410-605-7000	Y	for veterans
<b>Maryland</b>	Perry Point VA Medical Center	410-642-2411	Y	for veterans through PT or kinesiotherapy
<b>Massachusetts</b>	Edith Nourse Rogers Memorial Veterans Hospital	781-687-2000	Y	for veterans
<b>Massachusetts</b>	VA Boston Healthcare System	800-865-3384	Y	
<b>Massachusetts</b>	VA Central Western Massachusetts Healthcare System	413-584-4040	Y	
<b>Michigan</b>	VA Ann Arbor Healthcare System	800-361-8387   734-769-7100	Y	only with physical therapist
<b>Michigan</b>	Battle Creek VA Medical Center	269-966-5600   888-214-1247	Y	
<b>Michigan</b>	John D. Dingell VA Medical Center	313-576-1000	Y	veterans and employees
<b>Michigan</b>	Oscar G. Johnson VA Medical Center	906-774-3300	Y	with consult from PT
<b>Michigan</b>	Saginaw Aleda E. Lutz VA Medical Center	989-497-2500	Y	gym w/ resistance training equipment only available through PT
<b>Minnesota</b>	Minneapolis VA Health Care System	612-725-2000   866-414-5058	Y	only for employees
<b>Minnesota</b>	St. Cloud VA Health Care System	320-252-1670   800-247-1739	Y	for veterans and employees
<b>Mississippi</b>	Gulf Coast Health Care System	228-523-5000   800-296-8872	Y	PT gym for veterans and onsite fitness facility for employees only
<b>Mississippi</b>	G. V. (Sonny) Montgomery VA Medical Center	601-362-4471	Y	employee only
<b>Missouri</b>	VA St. Louis Health Care System - Jefferson Barracks	314-652-4100   800-228-5459	Y	Employee and patients
<b>Missouri</b>	VA St. Louis Health Care System- John Cochran Division	314-652-4100   800-228-5459	N	Onsite only for physical therapy - Shared with Jefferson Barracks
<b>Missouri</b>	Harry S. Turman Memorial	573-814-6000	N	
<b>Missouri</b>	Kansas City VA Medical Center	816-861-4700	Y	Employee Only

<b>Missouri</b>	John J. Pershing VA Medical Center	573-686-4151   888-557-8262	Y	Employee only
<b>Montana</b>	VA Montana Health Care System- Fort Harrison	877-468-8387   406-442-6410		
<b>Nebraska</b>	Omaha VA Medical Center - VA Nebraska-Western Iowa HCS	800-451-5796	N	
<b>Nebraska</b>	Grand Island VA Medical Center	308-382-3660   866-580-1810	Y	employee only
<b>Nevada</b>	VA Southern Nevada Healthcare System	702-791-9024		
<b>Nevada</b>	VA Sierra Nevada Health Care System	888-838-6256   775-786-7200	Y	Employee only
<b>New Hampshire</b>	Manchester VA Medical Center	603-624-4366   800-892-8384	Y	Exercise room - employee + WHOLE HEALTH center for patients
<b>New Jersey</b>	East Orange Campus of VA New Jersey Health Care System	973-676-1000	Y	Employees and Veterans - Wellness Center
<b>New Jersey</b>	Lyons Campus of the VA New Jersey Health Care System	908-647-0180	Y	Employees
<b>New Mexico</b>	New Mexico VA Health Care System - Albuquerque	505-265-1711   800-465-8262		
<b>New York</b>	VA Western New York Healthcare System - Buffalo	716-834-9200   800-532-8387	Y	Employee
<b>New York</b>	VA Western New York Healthcare System - Batavia	716-834-9200   800-532-8387		
<b>New York</b>	VA Hudson Valley Health Care System- Montrose	914-737-4400	Y	
<b>New York</b>	Va Hudson Valley Health Care System- Wappingers Falls	845-831-2000	Y	
<b>New York</b>	VA NY Harbor Healthcare System- Brooklyn	718-836-6600	Y	Veteran and employees - volunteers
<b>New York</b>	VA NY Harbor Healthcare System- Manhattan	212-686-7500	Y	Veteran and employees
<b>New York</b>	Syracuse VA Medical Center	315-425-4400   800-792-4334	Y	Employee and Veterans (MOVE! only)
<b>New York</b>	Canandaigua VA Medical Center	585-394-2000   800-204-9917	Y	Veterans and employees
<b>New York</b>	Bath VA Medical Center	607-664-4000   877-845-3247		
<b>New York</b>	Albany Stratton VA Medical Center	518-626-5000   800-223-4810		

<b>New York</b>	Northport VA Medical Center	631-261-4400			
<b>New York</b>	James J. Peter VA Medical Center	718-584-9000			
<b>North Carolina</b>	Asheville VA Medical Center	828-298-7911			
<b>North Carolina</b>	Durham VA Medical Center	919-286-0411   888-878-6890	Y		
<b>North Carolina</b>	Fayetteville VA Medical Center	910-488-2120   800-771-6106			
<b>North Carolina</b>	W. G. (Bill) Hefner VA Medical Center	704-638-9000   800-469-8262			
<b>North Dakota</b>	Fargo VA Health Care System	800-410-9723   701-239-3700	Y		Employee and veterans
<b>Ohio</b>	Chillicothe VA Medical Center	740-773-1141   800-358-8262			
<b>Ohio</b>	Cincinnati VA Medical Center	513-861-3100	Y		Employee and veterans (gerofit)
<b>Ohio</b>	Louis Stokes Cleveland VA Medical Center	877-838-8262   216-791-3800			
<b>Ohio</b>	Chalmers P. Wylie Ambulatory Care Center	614-257-5200   888-615-9448			
<b>Ohio</b>	Dayton VA Medical Center	937-268-6511   800-368-8262			
<b>Oklahoma</b>	Eastern Oklahoma VA HealthCare System	888-397-8387	Y		Employees and Veterans
<b>Oklahoma</b>	Oklahoma City VA Health Care System	405-456-1000			
<b>Oregon</b>	Portland VA Medical Center: Vancouver	503-220-8262   800-949-1004	Y		Employee and Veteran
<b>Oregon</b>	Portland VA Medical Center; Portland	503-220-8262   800-949-1004	Y		Employee and Veteran only if enrolled in specific programs - Scheduled times only
<b>Oregon</b>	VA Roseburg Health Care System	541-440-1000   800-549-8387			
<b>Pennsylvania</b>	VA Pittsburgh Healthcare System: University Drive Campus	412-822-2222   866-482-7488			
<b>Pennsylvania</b>	VA Pittsburgh Healthcare System: H.J. Heinz Campus	412-822-2222   866-482-7488			
<b>Pennsylvania</b>	Philadelphia VA Medical Center	215-823-5800   800-949-1001			
<b>Pennsylvania</b>	Altoona VA Medical Center	877-626-2500			
<b>Pennsylvania</b>	Butler VA Health Care System	800-362-8262	Y		Veterans and employees
<b>Pennsylvania</b>	Coatesville Veterans Affairs Medical Center	610-384-7711   800-290-6172	Y		Veterans

<b>Pennsylvania</b>	Erie VA Medical Center	814-868-8661   800-274-8387		
<b>Pennsylvania</b>	Lebanon VA Medical Center	717-272-6621   800-409-8771		
<b>Rhode Island</b>	Providence VA Medical Center	401-273-7100   866-363-4486	Y	Veteran and employee wellness center
<b>South Carolina</b>	Columbia VA Health Care System	803-776-4000		
<b>South Carolina</b>	Ralph H. Johnson VA Medical Center: Charleston	843-577-5011   888-878-6884		
<b>South Dakota</b>	VA Black Hills Health Care System: Fort Meade	605-347-2511   800-742-1070	Y	Employee gym
<b>South Dakota</b>	VA Black Hills Health Care System: Hot Springs	605-745-2000   800-764-5370	Y	Employee and veterans (1 hour)
<b>South Dakota</b>	Sioux Falls Health Care System	605-336-3230	Y	Employee gym on campus - Agreement with Local YMCA
<b>Tennessee</b>	Tennessee Valley Healthcare System; Murfreesboro	800-228-4973	Y	Veterans and employees
<b>Tennessee</b>	Tennessee Valley Healthcare System; Nashville	800-228-4973	N	
<b>Tennessee</b>	Memphis VA Medical Center	901-523-8990		
<b>Texas</b>	Mountain Home VAMC/Johnson City	806-355-9703   800-687-8262	N	
<b>Texas</b>	Amarillo VA Health Care System; Thomas E. Creek VA Medical Center	432-263-7361   800-472-1365	N	
<b>Texas</b>	West Texas VA Health Care System; George H. O'Brien, Jr VA Medical Center	800-924-8387   903-583-2111	Y	Employee only
<b>Texas</b>	VA North Texas Health Care System; Sam Rayburn Medical Center	800-849-3597   214-742-8387	Y	Employee Wellness Center
<b>Texas</b>	VA North Texas Health Care System; Dallas VA Medical Center	915-564-6100   800-672-3782	Y	Veterans and employee
<b>Texas</b>	El Paso VA Health Care System	956-291-9000   855-864-0516	N	
<b>Texas</b>	VA Texas Valley Coastal Bend Health Care System	866-487-1653		
<b>Texas</b>	South Texas Veterans Health Care System; San Antonio	254-752-6581   800-423-2111		

<b>Texas</b>	Central Texas Veterans Health Care System; Doris Miller Department of Veterans Affairs Medical Center	254-778-4811   800-423-2111	Y	Veterans and employee
<b>Utah</b>	Central Texas Veterans Health Care system; Olin E. Teague Veteran's Medical Center	801-582-1565	Y	Veteran and employee
<b>Vermont</b>	VA Salt Lake City Health Care System	802-295-9362   866-687-8387	Y	employee and veterans
<b>Virginia</b>	White River Junction VA Medical Center	757-722-9961		
<b>Virginia</b>	Hamptom VA Medical Center	804-675-5000	Y	
<b>Virginia</b>	Hunter Holmes McGuire VA Medical Center	540-982-2463   888-982-2463	Y	Employees only. Veterans with Gerofit referral
<b>Washington</b>	Salem VA Medical Center	206-762-1010   800-329-8387	Y	Employee gym
<b>Washington</b>	VA Pudget Sound Health Care System; Seattle Division	253-582-8440   800-329-8387	Y	Veteran and employee fitness center
<b>Washington</b>	VA Pudget Sound Health Care System; American Lake Division	509-434-7000   800-325-7940	Y	Veterans only - Opening June
<b>Washington</b>	Mann-Grandstaff VA Medical Center	509-525-5200   888-687-8863	Y	Employees
<b>West Virginia</b>	Walla Walla Jonathan M. Wainwright Memorial VA Medical Center	304-255-2121   877-902-5142	Y	Employee gym
<b>West Virginia</b>	Beckley VA Medical Center	304-623-3461   800-733-0512	Y	employee gym
<b>West Virginia</b>	Clarksburg - Louis A. Johnson VA Medical Center	304-263-0811   800-817-3807	Y	Employees and Veterans
<b>West Virginia</b>	Martinsburg VA Medical Center	304-429-6741	Y	Employee only
<b>Wisconsin</b>	Hershel "Woody" William Medical Center	888-478-8321   608 - 256-1901		
<b>Wisconsin</b>	William S. Middleton Memorial Veterans Hospital	414-384-2000	Y	Veterans and employees - certain hours for veterans.
<b>Wisconsin</b>	Clement J. Zablocki Veterans Affairs Medical Center	608-372-3971	Y	Veterans and employees - Veterans have priority
<b>Wyoming</b>	Tomah VA Medical Center	307-778-7550   888-483-9127	Y	Employees only
<b>Wyoming</b>	Cheyenne VA Medical Center	307-672-3473   866-822-6714		

