Randomized Controlled Trial of Group Prevention Coaching
NCT01838226
06/26/2019

Clinical Trial of Group Prevention Clinics
PI: David Edelman, MD, MHS
National Center for Health Promotion (NCP) Lead Collaborator: Margaret (Peg) Dundon, Ph.D.

A. SPECIFIC AIMS. *Improving prevention services* is a primary focus of the Secretary's New Models of Care Transformational Initiative. Primary prevention of cardiovascular disease (CVD) has been challenging to achieve; evaluation of new strategies for CVD primary prevention is the focus of this CREATE.

Multifactorial behavioral interventions are interventions that, instead of attempting to change a single health behavior among patients in a population (eg, increased physical activity, smoking cessation), allow individual patients to choose one or more among a number of behaviors, any of which may get them to a common clinical objective (eg lowering blood pressure). These interventions often use some of a set of common approaches, such as goal-setting and improving self-efficacy, to assist patients in behavior modification (refs). A recent systematic review suggests multifactorial behavioral interventions are likely efficacious in secondary prevention of CVD (1), and these interventions are also efficacious in a number of chronic illnesses (e.g., hypertension, diabetes). While there are studies that assess the performance of these interventions in patients without a common illness (eg, 2), there is little literature directly measuring risk reduction in a primary prevention population by means of multiple modest behavior changes (3-5); our group has performed such a study, but in a population very unlike VA (mostly white, mostly female, all insured) (3).

Problem solving (PS) is an approach to behavior change that has a long history in the mental health literature (6), but is much less used, and less well tested, in the prevention arena. PS is an evolution of cognitive-behavioral therapy that addresses internal barriers to changing behavior, urging patients to use specific techniques designed to prime them for success in any behavior change they propose to attempt . PS is well-tested in mental health (6,7), and there are small studies suggesting its utility in changing behaviors associated with improved physical health (8,9). It is traditionally done in an individual setting, but recent literature indicates promise in use in group settings (10). However, PS has unproven effectiveness both in group settings, and among primary prevention patients.

Group visits have been shown to be an effective means of improving outcomes in a number of settings (11). Group visits can either involve medication management or be entirely focused on behavior change; self-management groups (SMGs) are behavior intervention groups that are conducted by a trained facilitator and focus on having patients teach each other how to adopt healthful behaviors (usually in chronic illness). Because there is no requirement for medication management, SMGs can be used efficiently in patients without medication-requiring chronic illness, as there is no attendant cost of employing a prescribing provider. SMGs can be used as a strategy to deliver a multifactorial behavior intervention in patients with a common illness (eg, 12-14). However, our study above (3) is the only RCT we can find of SMGs in primary prevention.

We therefore propose a **2-arm, parallel-group, patient-level randomization RCT** to evaluate the effectiveness of **Group Prevention Clinic (GPC)**, an SMG intervention intensified by problem solving theory, in reducing CVD risk among primary prevention patients with >5% 10-year risk for a cardiovascular event as estimated by the Framingham Risk Score (FRS). The study will be set in the Durham, Buffalo, and Syracuse VAMCs. VA usual care will be the control. The following are the specific aims:

Primary Specific Aim (Aim1): To determine the effectiveness of GPC, compared to VA usual care, in reducing CVD risk in a primary prevention population.

Primary Hypothesis (H_1): Among patients with >5% 10-year risk for a cardiovascular event, there will be at least a 2.0% difference between GPC and usual care in reduction of predicted rate of fatal or non-fatal MI, as estimated by the Framingham Risk Score (FRS).

Aim 2: To determine the effectiveness of GPC (compared to VA usual care) in: (a) increasing physical activity, and (b) making dietary improvements.

H_{2A}: Compared to usual care, GPC will lead to an increase in physical activity as measured by International Physical Activity Questionnaire.

H_{2B}: Compared to usual care, GPC will lead to a decrease in saturated fat intake, as measured by Food Frequency Questionnaire.

Aim 3: Among intervention patients, to determine the role of group cohesion in predicting the success (or lack thereof) of GPC.

H_{3A}: Strong group cohesion, as measured by the Group Cohesion Scale, will predict improvement in FRS among patients receiving the GPC intervention.

Aim 4 (exploratory): To measure the cost of the GPC intervention.

B. BACKGROUND AND RATIONALE.

B.1. Cardiovascular (CV) event prevention. Cardiovascular disease (e.g., myocardial infarction, cerebrovascular accident) remains the single most important public health problem in the United States (15), and cardiovascular disease is a leading cause of death among VA users (16). CV events are mostly considered preventable by more appropriate treatment of CV risk diseases (eg, hypertension (HTN) and hyperlipidemia (HL)). Modification of behavioral risk factors (eg, smoking cessation, increased physical activity, stress reduction) is also key to CV event prevention, both by direct effect on health as well as by improving the risk diseases above. Improving the provision of prevention services is a primary focus of the Secretary's New Models of Care Transformational Initiative (17). However, prevention of CV disease has been challenging to achieve, as can be seen by continued inadequate risk factor management; a fifth of Americans (a greater proportion of VA users) continue to smoke, only half of people achieve physical activity goals, and more than a third of VA users do not achieve treatment targets for blood pressure and/or cholesterol (18-21). The evaluation of alternative strategies to improve CV disease prevention is the focus of our CREATE.

Primary prevention of CV disease is defined as the prevention of CV disease among patients without known CV disease. Primary prevention is often conceived of as better medication management of a single risk disease, and large drug trials of lipid or blood pressure medication management often label themselves as primary prevention (eg, 22, 23). However, primary prevention may also reach a large, relatively healthier subset of patients who may or may not have any specific risk disease (eg HTN, HL) but who have elevated risk, and whose common element is that they have one or more of a number of unhealthful behaviors, such as poor eating habits or a sedentary lifestyle, or smoking. Interventions on this much larger population may ultimately have a broader impact on population health than those targeted at specific CV risk illnesses (24).

B.2. Multifactorial behavioral interventions. Interventions for people with one or more unhealthful behaviors may choose to focus on a single health behavior; such interventions as smoking cessation groups or personal trainers are examples of this. However, it is also possible to attempt to modify a range of different behaviors across different patients as an approach to overall health improvement. Typically, these interventions attempt to improve patients' self-efficacy (see section B.5 below for details, 1). These interventions often take a tailored approach to behavior change; the patient chooses the behavior to change, and the interventionist works with the patient to set goals and to overcome barriers to achieving those goals (25). After that, the person assisting with behavior change provides close follow-up on that particular behavior. The interventionist can be a professional (eg, a nurse) or a motivated layperson (25- 27); when the interventionist is a layperson the interventionist is often called a healthcare coach (26-27). Interventionists usually receive formal training in one or more well-evaluated strategies to promote behavior change (eg, motivational interviewing, (28)).

B.2.a. Potential use of multifactorial behavioral interventions in primary prevention. Multifactorial behavioral interventions have been applied widely and effectively by us and others to individual risk illnesses (eg, HTN, diabetes) (3,11,26). However, these types of interventions might also be applied to a primary prevention population. For such patients, small improvements across a number of behaviors (eg diet, exercise) or clinical parameters (eg BP, cholesterol) can add up to overall significant risk reduction (3-5). This is well-understood in theory (24), but while there are randomized trials that assess the performance of these interventions on risk behaviors in patients without a common illness (eg, 2), there is little literature directly measuring risk reduction in a primary prevention population by means summing the effects of multiple modest behavior changes; our group has performed such a study, but in a population very unlike VA (mostly white, mostly female, all insured) (3).

B.3. Problem solving. Problem solving (PS) is an approach to behavior change that has a long history in the mental health literature, but is much less used, and less well tested, in the "physical" illness arena. Problem-solving theory defines a "problem" as "any situation in which an immediate and easily recognizable solution is not apparent (29)." The 5 cornerstones of the problem-solving approach are: (a) Orientation, or developing self-efficacy for solving your own problems; (b) Definition, the choice of a particular problem and the setting of a goal to overcome that problem; (c) Generation of Alternatives, the outlining of a number of potential plans to achieve the goal; (d) Decision-Making, the determination of the probable outcomes and consequences of these plans; and (e) Implementation, or the choice and follow-through on a specific plan to achieve the goal (29). Early epidemiological studies found a strong association between the inability to manage problems and depressive symptoms (30). The foundation of PS is to teach patients core skills (eg, resilience, coping (see section B.5 below for details)) for approaching any or all of their own problems, and especially to recognize and overcome patients' internal barriers to general problem-solving skills (29-31). Because the early literature

linked problem solving and depression, in the mid 1980s problem-solving therapy (PST) emerged as a modified cognitive-behavioral therapy approach to managing depression. The efficacy of PST in depression is well-established (6). Furthermore, PST can be used in a primary care setting; a recent VA evidence synthesis found this to be an effective intervention for depression (7).

B.3.a. Potential use of Problem Solving for primary prevention. The problem solving theoretical framework has been extended to "physical" health as well. In this approach, patients are trained to identify internal barriers to general healthful behavior change, overcome these barriers, and then go on to adopt healthier behaviors. The literature on problem-solving training for salutary CV behavior change is scant, but there are a few promising preliminary data among patients with diabetes. A 2010 study, similar to the early epidemiological studies in mental health, showed significant and clinically meaningful associations between problem solving and diet and exercise (32). Similarly, a small (N=29) pilot trial comparing problem solving training to didactic education showed clinically important effect sizes for improvement in minutes of moderate physical activity, development of a healthful eating plan, and weight (none statistically significant, 33). Finally, an RCT of a PS intervention for weight loss maintenance showed that the problem solving intervention was better not only than a usual care control, but also than standard relapse-prevention training (8). These results suggest that the use of PS in primary prevention has a reasonable chance of success.

B.4. Group Interventions. *Group visits* have been shown to be an effective means of improving a number of outcomes in a number of settings (reviewed briefly in (11)). Group clinics, in general, are thought to be an efficient care strategy, and may have special advantages over individual care where shared group experiences may promote better health. This theory revolves around the notion that the peer support offered by each member of the group to other members leads to a social environment more conducive to healthful behavior choices. This theory is largely untested in the healthcare setting; that is, only one study of a group intervention (as far as we can find) directly measured the extent to which the group assists each member in making better choices around her/his health (34). However, there is evidence in the workplace and education literature that perceived workgroup coherence by individuals in the group is associated with better individual performance (35). The most relevant type of group strategy to health behavior change interventions is the self-management group (SMG), which is a group-based approach to multifactorial behavioral intervention.

B.4.a. Self-Management Groups. SMGs are conducted by a trained facilitator and are focused on having patients teach each other how to cope with and master living with and managing chronic illness (36). Groups usually have consistent membership, both in terms of facilitators and patients, and they usually meet several times over the course of a period of months (36). RCTs of SMGs have consistently shown strong efficacy in reducing symptom burden in symptomatic illnesses, in particular illnesses with pain as a primary symptom, and often with concomitant improvements in self-efficacy (37, 38). However, the effect of SMGs among patients who need to change behaviors that do not have a large impact on acute symptoms has been consistently small; that is, several studies have shown only modest potency of SMGs on impacting cardiovascular risk (e.g., 12-13). This suggests a need to enhance the traditional SMG as an approach to primary prevention.

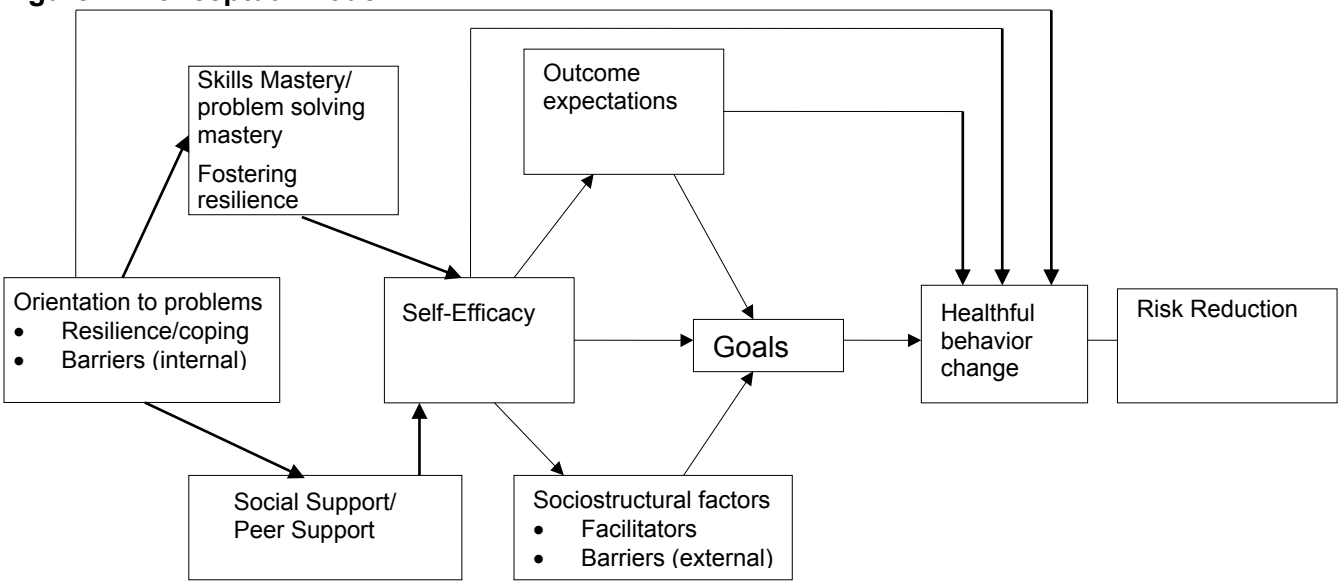
B.4.b. Problem Solving in Groups. Problem solving therapy did not originate as a group intervention. However, problem solving training interventions have been tested successfully in group settings, and it is now widely used in that fashion. Again, the theory is that group members, facilitated by a trained behavioralist, will help each other learn the coping skills required to overcome internal barriers and achieve healthful behavior change. Group PST was first tested for depression in a non-VA setting and found to be superior to usual care (10). Additionally, a recent VA pilot (N=54) study conducted by one of our investigators (JN, see B.6 below) used a group strategy for PST and found promising results on outcomes such as problem-solving approaches and resilience. Finally, the weight loss maintenance PS intervention shown in section B.3.a above was a group intervention, showing the potential efficacy of group PS in promoting behaviors important to primary prevention (8).

B.4.c. Brief individual contacts as supplements to group interventions. Many group interventions utilize brief individual contacts to enhance the group intervention (eg, 3,11). This can be done either as a "breakout" session in the context of the group (in which the individual leaves the group for 5 minutes or so to talk to a provider other than the group facilitator) or as interval telephone calls. The purpose of these brief individual interactions is to assure that each individual goal is addressed one-on-one, without disrupting the peer support aspect of the group setting. From a theoretical perspective, phone calls and group may use different pathways to improve self-management (see section B.5 below). Finally, we have used SMGs with adjuvant phone calls successfully in a prevention setting before (3).

B.4.d. Potential for group interventions in primary prevention. We have shown that SMGs without some sort of enhancement are not likely to be a successful primary prevention intervention. We also see above that group settings show the potential to be a successful and efficient way to deliver a problem solving intervention for healthful behavior change. Finally, we have argued that it is theoretically reasonable that groups may have a salutary effect on members' behavior change. We think that it follows logically that SMGs, enhanced by problem solving and adjunctive phone calls, may potentially be a successful primary prevention intervention. Below, we outline a theoretical model that further suggests that PS may have a synergistic, or at least additive, role in effecting healthful behavior change in groups, and then show preliminary data that support that theory.

B.5. Conceptual Model. The core of our conceptual model used to develop the proposed intervention was adapted from Bandura's Social Cognitive Theory (SCT) (see Figure 1, 39-41). According to SCT, self-efficacy is central to behavior change. Self-efficacy is shaped by our own behavior (through skills mastery, reinforcement, and persuasion) as well as our social environment (through observational learning, verbal reinforcement, and persuasion). In turn, self-efficacy influences health outcomes both directly and indirectly through outcome expectations, sociostructural factors, and personal goals (40, 42-46).

Figure 1: Conceptual Model



An outcome expectation refers to the belief that a positive outcome will occur as a result of a behavior. Sociostructural factors are situational, and health system facilitators and barriers to health behavior change, such as cost. Goals, which may be short-or long-term, are rooted in values and provide an incentive for performing healthy behaviors.

Social support is also an important concept in SCT that describes the structure, processes, and functions of social relationships. Social support can affect health outcomes both directly and indirectly (47-50). In the context of group interventions, peer support from the group is an important form of social support for group members. Group dynamics theory (51) holds that decisions made in groups are very different from those made without group support. Group cohesion is defined a sense of the "we-ness (52)" of the group, and it is the key concept underlying the extent to which group members support each other to make better decisions (53). If a group member does not feel "coherent" with the group, s/he will reject the help of the group in making a better decision, and stop participating or even stop attending altogether. In contrast, if a patient feels coherent with the group, other members of the group can help access information, identify and solve problems, avoid stressors, or even enhance self-efficacy.

The added phone calls provide support in translating self-efficacy learned in group into goals (27). While the group sessions will foster the outcome expectation that healthful behavior changes will lead to better outcomes, the phone interventionist will use techniques such as motivational interviewing during the brief calls to assist each patient in understanding the outcome expectation that her/his individual goal will lead to specific, individual positive outcomes (26,27).

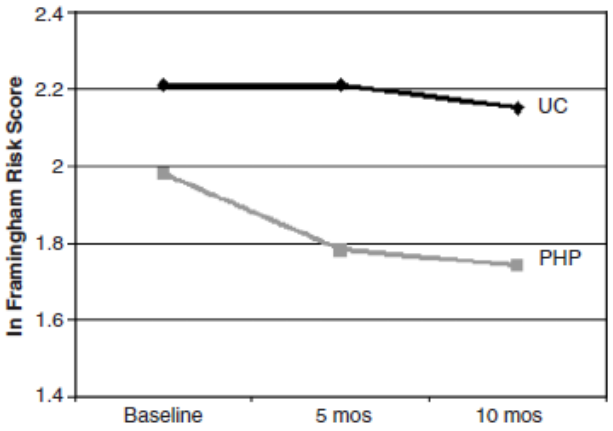
In addition to SCT, the intervention is informed by problem solving theory, which states that healthy choices are a function of people's problem-solving approaches. Problem solving focuses especially on

fostering "resilience." A recent article employing systematic review principles, concept analysis, and stakeholder consultation broadly defined resilience as the "process of effectively negotiating, adapting to, or managing significant sources of stress or trauma" (Windle, 2011, p. 152). Resilience is also associated with better outcomes among patients with diabetes (55). By teaching patients to overcome internal barriers, to master better problem-solving techniques, and to be more resilient, we expect to prepare them to be better able to deal with the sociostructural (external) barriers that they will face and make better use of the strategies they use to achieve their stated personal goals. In essence, we will use problem-solving to "prime" patients for using traditional goal-setting approaches to change behavior, with the expectation that this will enhance the success of these approaches.

Our study measures were selected to reflect both the processes and outcomes of behavior change. Our primary outcome will be Framingham Risk Score (FRS), a well-validated predictor of cardiovascular events (D.8.a below), which should be lowered with any number of healthful behavior changes (eg healthier eating, increased physical activity, smoking cessation). We will also measure those behavior changes directly. Those changes, in turn, should be increased to the extent that patients are high in self-efficacy, have increased their resilience, and feel as though they have been supported by the peer group (self-efficacy, resilience, and group cohesion are our process outcomes).

B.6. Preliminary studies.

B.6.a. Group multifactorial behavioral interventions can reduce cardiovascular risk. A group of researchers led by Dr. Edelman performed a small randomized trial of a multifactorial behavioral (coaching) intervention to improve cardiovascular risk (3). The intervention was similar to the one we will propose below, with multiple group sessions and interval individual phone calls designed to teach empowerment skills and set goals, and individual phone calls for follow-up on goal achievement. Problem solving was not part of the intervention. The primary outcome was Framingham Risk Score (FRS), which will be our primary outcome here. Intervention patients showed greater improvement in FRS at both 5 and 10 month follow-up (see figure, p=0.06 at 5 months and p=.04 at 10 months). Note that most of the improvement occurred in the first 5 months. Also improved in the coaching arm were increase in days of moderate exercise (1.3 more days compared to usual care, p=0.006) and (not significantly) weight loss (~1 kg more compared to usual care, p=0.11). However, there were important limitations to this study, both scientific (differential dropout between arms) and in terms of significance to the VA (study population was 80% female, 60% college-educated, and median income was >$60,000). This study provides proof of concept that group multifactorial behavioral interventions similar to ours can reduce CV risk, and validates FRS as a measure sensitive to change. However, knowledge gaps remain surrounding the extinction of the effect after coaching stops, and whether these positive changes may be seen in a VA population. It also demonstrates our ability to deliver a group plus telephone follow-up intervention.



B.6.b. Multifactorial behavioral interventions can improve CV risk behaviors among Veterans. Dr. Voils led CouPLES, a spousal support intervention to improve cholesterol (56). The intervention had some similarities to our proposed approach in that patients were allowed to choose from a menu of behaviors to potentially lower their cholesterol, and a phone interventionist trained in motivational interviewing helped patients set goals regarding CV risk behaviors (diet, activity, med adherence). CouPLES was a null study on its primary outcome, LDL-cholesterol. However, there was a moderate, near-significant increase in number of patients reaching physical activity goals compared to usual care (20% greater increase, p=0.06) and a modest, statistically significant decrease in total (12g/d larger decrease compared to control, p= 0.02) and saturated (3g/d, p=0.02) fat intake. These results show our ability to improve CV risk behaviors among Veterans using complex interventions, and highlight the importance of using composite outcomes more sensitive to subtle multi-behavioral changes than individual clinical outcomes (eg LDL-C, BP)

B.6.c. Group interventions can improve Veterans' Health, and potentially be cost effective. Drs. Edelman and Jackson led a randomized controlled trial at two VAMCs of Shared Medical Appointments for Diabetes and the economic analysis of that trial, respectively (11). The results showed that Shared Medical

Appointments improved systolic blood pressure 7 mmHg compared to usual care, and LDL-cholesterol by 9 mg/dl; there was a modest, not statistically significant improvement in hemoglobin A1c (0.3 percentage points; p=0.16). The economic analysis showed statistically significant improvement in per patient cost and in hospitalizations in the second year after the end of the intervention when compared to usual care. Similarly, Dr. Wray co-led a family caregiver intervention using PST, among other components, and found that the cost of care for Veteran care-recipients was on average approximately $2700 less than Veterans receiving usual care (57). These results show that (1) group strategies have the potential to save money, and (2) we can deliver a multi-site group intervention randomized trial in the VA. Note that the group visit strategies here are totally different from the one we propose; see section D.5.

B.6.d. Problem-Solving can be done with Veterans in groups. Dr. Nieuwsma was a major investigator in a pilot project to perform group problem-solving among veterans. This pilot sample of mostly younger veterans (median age = 27) received a 4 session group problem solving intervention. This uncontrolled study showed improvement, not always statistically significant, across a wide range of psychological constructs. While numerous measures directly related to quality of problem solving improved with this group PS intervention, two important other measures are highlighted. First, depressive symptoms improved significantly. Second, resilience also increased, albeit not statistically significantly. This study demonstrates that problem solving can be done among groups of veterans in a mental health setting, that group problem solving has some promise in fostering resilience, and that our team has the expertise to deliver a group problem solving intervention.

	Pre-PST	Post-PST	
Measure	**Mean (SD)**	**Mean (SD)**	
PHQ-9	***12.8(7.5)***	***9.8(6.8)***	***p<.05***
Brief Resilience Scale	***17.2(5.8)***	***17.8(5.9)***	***p=.14***
Positive Problem Orientation	10.2(4.4)	11.3(4.5)	p=.10
Negative Problem Orientation	9.0(4.7)	7.8(4.8)	p<.05
Impulsivity/Carelessness Style	7.8(3.9)	7.0(4.4)	p=.16
Avoidance Style	8.7(5.4)	6.6(5.0)	p<.05
Rational Problem Solving	9.2(5.0)	10.3(5.0)	p=.07

B.6.e. Summary of our team's experiences. We have shown that: multifactorial behavioral interventions can change CV risk behaviors among veterans; group interventions are acceptable and potent among veterans; group PST is acceptable and potent among veterans; and that multifactorial behavioral interventions can reduce cardiovascular risks, albeit in populations quite different from the VA. More importantly, we have shown that, as a team, we can deliver all the components both of our intervention (group, problem-solving, and multifactorial behavior change) and of our scientific plan (RCT, multiple VA sites, FRS as primary outcome).

B.7. Summary and rationale. In summary:

- Primary prevention is important to the VA and for population health;
- Multifactorial behavioral interventions are promising for primary prevention, and have some limited direct evidence of efficacy in primary prevention;
- There is preliminary evidence that problem-solving may be able to change CV risk;
- Problem-solving in groups is generally accepted;
- Groups show promise for prevention, but to date self-management groups have not improved CV risk;
- Our team has shown that multifactorial behavioral interventions can improve CV risk, that a self-management group enhanced with telephone calls can effect healthful behavior change; that we can effect healthful behavior change among Veterans, and that we can deliver efficacious problem-solving interventions.

We therefore propose that a group intervention, with supplemental additional telephone contacts and enhanced by problem solving, is an intervention that has a high probability of improving cardiovascular risk behavior and thus improving primary prevention. We propose to test this approach in a multi-site VA randomized, controlled trial. Additionally, our close relationships with influential users of problem-solving, and with VA's National Center for Prevention (NCP), will allow this intervention to be directly implemented if effective and cost-effective (see Significance, section C below).

C. Significance to VA.

VHA has committed to 3 key aspects of this study: prevention, problem solving, and group visits.

Prevention is a primary focus of the Secretary's New Models of Care Transformational Initiative (58). In particular, primary prevention, prior to the onset of CV disease or disease states with a very high risk for comorbid CV disease such as diabetes or peripheral artery disease, is going to be increasingly relevant to VA in dealing with younger veterans such as those returning from Central Asia. The model of care that we are testing potentially represents a novel, effective, and cost effective approach to primary prevention. NCP, which

has been involved in the development and design of this study from the beginning, is clearly strongly interested in the results. Additionally, the choice of interventionists who mimic key prevention personnel already at VAs (section D.5.a, below) will allow NCP to rapidly implement this intervention across VA if it is effective.

Problem Solving is strongly promoted by VA Mental Health Service Line. That group has conducted pilot studies looking at rolling out PST in that context; but they have communicated to us an interest in evaluating problem solving in physical health as well. Dr. Nieuwsma's ongoing work with with VA problem solving leaders (ie, Dr. Wendy Tenhula, VA Senior Consultant/Liaison for Psychological Health, (59)) will allow us to inform them on the potential use of problem solving in prevention, and will also allow us to implement this aspect of our intervention with relative ease.

Group Visits have been mandated by VA as part of PACT (60). They are thought to represent an efficient means to provide access to high-quality care, and there is evidence that they meet that goal for patients with serious chronic illness, including in the VA (11, 61-63). However, group visits for patients without severe or symptomatic chronic illness have not been studied well. This proposal allows PACT to determine the role of group visits for relatively healthier patients; it may define the limits of the group model in VA, or allow VA to confidently expand group care to a much wider range of patients.

D. RESEARCH DESIGN AND METHODS

D.1 Study Design. We propose a randomized, controlled trial (RCT) of our GPC intervention (details in section D.5 below). Outcomes will be measured at baseline, 6, and 12 months after enrollment. The control group will receive usual care.

D.2. Setting. We will perform the study among patients at the Durham and Buffalo VAMCs. Multiple VAMC settings are used to increase generalizability, and to increase numbers of eligible patients. Dr. Laura Wray, key personnel on this grant, is core faculty of a VA Mental Health Center of Excellence, the VISN 2 Center for Integrated Healthcare (CIH). The goal of CIH is to integrate behavioral health into primary care. The center has numerous research projects ongoing at all times; research personnel at CIH are on staff at Buffalo VAMC**.** Buffalo will be treated as an equal site for the scientific protocol, with the goal of approximately equal enrollment from Buffalo and Durham.

D.3. Patients. The patients will be 400 VA users (see enrollment feasibility, D.3.c.v, and sample size, D.9, below) without prior history of cardiovascular event, but with at least 5% risk of such an event, with at least 2% of that risk potentially reversible.

D.3.a. Framingham Risk Score. FRS (64) is calculated using age, gender, blood pressure, total and HDL cholesterol, smoking status, diabetes status, and status of taking blood pressure medication; we are excluding diabetic patients (see D.3.a.ii below). As such, all patients in the study will have hypertension with less-than-optimal control, **OR** elevated total cholesterol, **OR** be a current smoker. The table shows some typical FRS risk profiles. The examples are all male non-smokers:

	Subject A1	Subject A2	Subject B1	Subject B2	Subject C1	Subject C2
Age	50	50	55	55	55	55
SBP (on med)	-	-	-	-	140	-
SBP (no med)	135	135	160	140	-	140
Total cholesterol	210	190	190	190	190	190
HDL	35	45	45	45	45	45
10 yr FRS	**7%**	**5%**	**9%**	**7%**	**9%**	**7%**

D.3.b. Rationale for 5% risk, with 2% reversibility. We are targeting a group of primary prevention patients that are relatively sick for primary prevention. A 2% reversibility is chosen because this is approximately the effect size seen in our study of a similar intervention among non-VA users; 5% baseline risk is chosen because patients with lower risk than this likely will not justify this relatively intensive intervention (nor, often, have 2% reversibility).

D.3.c. Process for identifying eligible patients. We will use a multi-phase process to identify patients that fit this demographic, reviewing aggregated local CPRS data first, then reviewing individual charts, then interviewing patients and obtaining lab data. We will target enrolling 200 from each site (Durham and Buffalo).

D.3.c.i Accrual of potential eligible patients from database: Patients will be initially identified from local VA administrative data (or VINCI, depending on VA policy at that time). In the database phase, identification will use the following inclusion and exclusion criteria:

- Inclusion: a diagnosis of inadequately controlled hypertension, as defined by an outpatient ICD-9 code of 401.x and a most recent blood pressure with either systolic > 140 mmHg or diastolic >

90 mmHg, **OR** (2) inadequately controlled dyslipidemia, as defined by most recent total cholesterol > 200 mg/dl **or** HDL cholesterol < 35 mg/dl, **OR** (3) current smoking, which can be identified using the CPRS Health Factor tied to the smoking clinical reminder. Medication-taking status for these illnesses is neither required nor excluded.

D.3.c.ii First contact of potentially eligible patients: Patients who are eligible by database criteria will be contacted by letter, asking them to call a toll-free number if they do not wish to be called for the study, or if they wish to consider enrollment. Those who do not call within 1.5 weeks of mailing letters will have medical records reviewed by study personnel.

D.3.c.iii Chart review phase exclusion: We will exclude patients whose electronic medical record reveals any of the diseases that are exclusions in the database phase above, or which contradicts the database inclusion (for example, a patient who has quit smoking since the last completion of the smoking cessation reminder). We will also, at this phase, exclude patients with other severe intercurrent illness or poor life expectancy, as defined by: Active treatment of any malignancy, except for hormone treatment for breast or prostate cancer; renal dialysis or cirrhosis of the liver; psychiatric hospitalization within the last 3 years, or requirement for oxygen at any waking hour.

We will also exclude patients who appear in the electronic medical record to be currently engaged in formal efforts to improve a CV risk behavior, including: enrollment in smoking cessation clinic in the last 6 months; MOVE! enrollment within the last 6 months, or intentional weight loss of at least 5 pounds in the last 3 months.

Any patient not excluded at this time will be contacted by phone for the study. Interested patients will be have their inclusion and exclusion criteria reviewed over the phone. This will include all criteria mentioned previously as well as the Short Portable Mental Health Status Questionnaire (65) to determine cognitive impairment. Finally, the RA will also ask the patient if s/he has set a quit date for smoking, or has enrolled in a community-based weight loss or physical activity program; a “yes” answer to either of those will exclude the patient. If the patient is still eligible and interested, s/he will be asked to set up a time and place for enrollment (see D.4, below).

D.3.c.iv. Interview and lab phase inclusion and exclusion. As part of the enrollment visit, blood pressure and cholesterol will be measured (see below); patients who lose their eligibility due to improvement of either of these parameters will also be excluded prior to randomization.

D.3.c.v. Self-referral Based Recruitment Strategies. In addition to the aforementioned outreach-based recruitment strategies, we will add several approaches that allow patients to self-refer into the study. IRB-approved flyers will be distributed around the medical center in approved locations, and included in the first contact letters. IRB-approved ads in other formats will also be placed in approved medical center locations, potentially including the closed-circuit patient television and the DVAMC Facebook page,

D.3.C.vi. Enrollment Feasibility. We do not anticipate problems enrolling 200 patients at each site. In a recent evaluation of our local data, we found approximately 5500 patients with poorly controlled hypertension or hyperlipidemia. Estimating conservatively that 50% of these patients have either diabetes or some other vascular exclusion criterion, this will leave approximately 2800 patients eligible for the study by hypertension or hyperlipidemia; smokers will only add to this number. As we are usually able to recruit 25-35% of eligible patients into our studies at the Durham VA, we expect to easily enroll 200 subjects into our study. Buffalo is similarly rich in eligible patients.

D.4. Enrollment and Follow-up Procedures. After patients have agreed to participate in the study, the research assistant (RA) will meet the patient at the local VA or CBOC, and written informed consent for the study will be obtained. Next, the RA will measure a blood pressure. After that, patients will complete all baseline measures (see D.8 below), which will take approximately 30-45 minutes. Finally, the patient will be escorted to the lab for the draw of a non-fasting lipid panel.

Once patients have completed the measurement battery and blood draw, we will prepare to randomize them to receive or not receive the GPC intervention. To maintain blinding, patients will be randomized remotely from the enrollment, and the blinded research assistant will not provide the assignment. Instead, the research assistant will obtain a date, time, and working phone number for a randomization phone call to be made (within 3 business days) by the research assistant from the other site (Durham vs. Upstate New York). This delayed randomization is also required in order to allow lipid testing to be completed, so that patients with a baseline FRS of < 5%, or lack of reversible risk, may be excluded. *To maintain subject engagement, intervention patients will be mailed “Moving Forward,” a VA-approved primer on Problem-Solving, after randomization (see D.4.a below).*

Participating individuals will be followed for 12 months. The intervention lasts only 6 months; however, patients are in theory being taught lasting skills in the intervention. It is therefore an important question to determine if the effects of the intervention (if any) extinguish after contact with the program ends. The local RA will ascertain the measurement battery at baseline, 6, and 12 months. At all follow-up visits, the RA assigned to measure outcome variables will be blinded as to which group the patient is randomized. Patients will receive $50 compensation for each scientific visit, for a total maximum of $150 for the scientific visits.

D.4.z. Pilot Study. The first 10 patients enrolled into the study will be part of a pilot cohort. They will not be randomized; instead, all 10 will be assigned to the intervention (section D.5 below). These patients will have the same patient experience as patients randomized to the intervention arm (D.4.a below). This is being done to determine if the intervention needs modification prior to implementation in the study. These patients will sign a separate, clearly marked consent form notifying them that they are in a pilot study; however, the risks of the pilot are essentially identical to the risks of the planned trial.

D.4.a. Randomization. The project's masters-level statistician will maintain a computer generated, patient randomization sequence separate from the site of patient enrollment. The group assignment will be communicated to the opposite site RA (ie, Durham patients will receive a randomization call from the Upstate NY RA, and vice-versa). That RA will make the phone call at the appointed time, and explain the implications of the arm assignment to the subject. This will allow the local RA to remain blinded to arm assignment for follow-up evaluation. Randomization will be stratified by site and gender. Patients randomized to the GPC arm will be offered a choice of one of a few possible half-days for their group session to meet, and that choice will lead to the patient's assignment to a particular GPC group.

D.5. Intervention. The GPC intervention will be delivered to patients in the active arm. The basic structure is that of a group problem-solving intervention, with interval phone calls delivered to check in on goal progress and reinforce group learning. Groups will meet monthly for 6 months, and each patient will be called once between each group session. Based on our experience with delivering problem solving groups (JN), each group will consist of 10 patients. In general, problem-solving principles will represent the content of the group sessions. Problem solving theory is described in greater detail above (B.4). Again, problem solving intends to teach patients to overcome internal barriers to healthful behaviors. We will directly assess the effects of problem solving in our intervention by use of the CD-RISC (D.8.b.iii.b).

The problem solving orientation will be combined, at all group sessions, with the typical self-efficacy training used in SMGs, so that patients will be taught simultaneously to overcome both internal and external barriers. Similar to our prior studies (eg, CouPLES (56)), participants will be asked to develop personal goals related to CVD-related behaviors (e.g., smoking and weight reduction). We will directly assess the coaching effects by measuring self-efficacy across chosen behaviors using the Patient Activation Measure (PAM, D.8.b.ii.a below)

D.5.b. Intervention personnel. The groups will be coordinated by a person with a Masters in Social Work (MSW) hired for the research enterprise but trained and credentialed identically to a facility's Health Behavior Coordinator (HBC). Each facility now has an HBC, and the work of the HBCs is coordinated by the NCP. The role of a facility's HBC is to be the lead interventionist in implementation efforts toward preventive health, and to use behavioral techniques to achieve these goals. HBCs are almost all either clinical psychologists or MSW-level social workers, and all are trained in behavior change techniques (e.g., motivational interviewing; see section D.7 for details). Additionally, NCP plans to train HBCs in problem-solving in the near future. It is this training in multiple approaches to behavior change that makes the HBC the appropriate interventionist for GPCs. We will use either an HBC or HBC equivalent so that if GPCs are effective, they can be easily implemented with the personnel already assigned at each VAMC.

The phone calls associated with the intervention will be performed by a healthcare coach, who will work closely with the group interventionist. Coaches are relatively inexpensive personnel who are in wide use across the private sector for telephone counseling. The rationale for the use of coaches is also based on translation of the intervention; at some facilities, HBCs are looking to hire and train sub-RN-level personnel to deliver behavior change interventions that the HBC would coordinate. There is no need for a masters- or RN-level trained person; coaching interventions are normally (and successfully) delivered by coaches without that level of training (3, 26, 27). However, the intervention coaches will be trained in coaching techniques in general, and in MI in particular, prior to starting the intervention (28).

D.5.c. Intervention structure. As soon as 10 patients at a site have been randomized to the intervention arm that are willing to attend on a given half-day, a group will be formed and patients will be called and notified

about the time and place. Our experience is that the half-day will be set and the first visit will occur within 2-4 weeks of the enrollment visit for each patient. Groups will meet every month for 6 months. The same 10 patients will meet each time with the same group facilitators, on the half-day of the week chosen as described above. Group sessions will last 90 minutes; the first 20 minutes are set aside for social interaction as a means to engage the patients (11), and the remaining 70 minutes are for content delivery (see D.5.d). Phone calls will be made once to each patient in the interval between group sessions.

D.5.d. Attendance Enhancement Strategies. Above and beyond the usual encouragement to attend group sessions, we will attempt to increase attendance by having patients sign attendance contracts. Behavioral contracts have been shown in randomized, controlled trials to improve attendance to group sessions (66, 67). Patients will sign the attendance contract immediately upon arriving to the first group session. In addition to contracts, we will offer a cash reimbursement of $25, similar to the expected travel pay for a clinic visit for a patient living 20 miles away, for patients attending group sessions. In our hands, session attendance has been approximately 80% using this combined approach (11).

D.5.e. Group Session Content. The group session content is taken from pre-existing group problem-solving session content, and modified to reflect both the focus on cardiovascular prevention rather than on mental health concerns as well as the self-efficacy training orientation.

Session 1 teaches the first four cornerstones of problem solving; orientation, definition, generation of alternatives, and decision-making. ***Orientation*** can be thought of as a form of self-efficacy for solving a wide range of problems. In traditional case management, this involves first identifying a behavior that a patient wants to change but feels unable to change, identifying barriers, *usually external* (e.g., inadequate transportation), that stop the desired behavior from occurring, and having the case manager provide a solution to that barrier. Under the problem-solving approach, the first step is to identify *internal* barriers (e.g., procrastination) that inhibit the ability to achieve a number of behavior change objectives; external barriers are identified and addressed later in the process. Therefore, the first part of the first group session is to get patients thinking and talking about their individual internal barriers; the intention is for patients to be able to help each other approach managing their barriers in new and more effective ways.

Next, the ***definition*** cornerstone is taught. Problem solving theory holds that not all categories of problem solving are equal, and so patients are encouraged to critically evaluate their own approach and consider how to make changes to it based on the skills learned in session one. Patients are introduced to a preferred approach to complex problem solving; “externalize, visualize, and simplify.” Patients will also be taught skills for distancing themselves emotionally from their internal barriers, so as to more rationally solve problems. At this point, patients should be chosen a healthful behavior they are ready to adopt.

Finally, the ***generation of alternatives*** and ***decision-making*** cornerstones of problem-solving are introduced. Here we teach patients to 1) generate a long list of possible healthful behaviors to adopt, including potentially somewhat original (for each patient) approaches to behavior change (eg, a form of exercise that a particular patient has never considered before), and then (2) thoughtfully evaluate each solution for probable positive and negative outcomes of each. It is here that external barriers and solutions will be considered for each potential behavior change.

After having mastered these concepts, patients should be ready to use the tools and approaches learned to choose a particular salutary cardiovascular goal they are not achieving (eg, weight loss), to make a list of potential actions that will allow them to achieve that goal (e.g., using the externalization strategy of creating lists, make a list of potential strategies for weight loss as a way to structure steps toward achieving healthy behaviors), and then choose a specific strategy for prevention (eg, stop eating at bedtime). The first phone call, a week after the group session, will finalize the goal and confirm an action plan for its achievement.

Session 2 focuses on the *implementation* cornerstone of problem solving. It teaches skills that provide further support for performing the action plan. First, this session refines the part of session 1 that involves “externalize, visualize, and simplify,” by asking patients to use these techniques with regards to their specific action plan. Second, if the plan involves another person (such as a significant other who cooks, for a diet plan), patients are asked to roleplay the communication with the other person. Finally, patients are asked to consider how they will evaluate their progress along their plan towards their goal (e.g., home blood pressure measurement, steps on a pedometer). For those who are struggling to act on the plan they have developed, this session can allow patients to expand on the concepts from session 1, in particular re-evaluating the plan for unexpected positive and negative outcomes, and potentially reconsidering the plan for another plan working

toward the same goal. The follow-up call will not only reinforce the action plan but check in with the chosen method of progress evaluation.

Sessions 3-5 focus on evaluating the success of each member's plan in accomplishing their particular goal. Patients are encouraged to assess how well they are meeting their goals. This is done both using the objective measures determined in session 2 (are you losing weight?) but also subjective assessment (do you feel better? Are others in your life noticing a positive change?). Patients compare the actual effects of the plan to their predicted effects in an effort to refine their ability to predict outcomes of various plans to address their next goal. At this point, patients are also encouraged to reward themselves for any success they are having. Finally, patients will have the opportunity to re-evaluate their goals and action plans, with the potential to either (a) change an action plan that is failing, or change a goal as other goals become more important, or (b) add additional action plans or even goals if they feel ready to do more than they have been doing. It is common in this session to ask a group member to share a problem with the group, and then have the group walk through the entire problem-solving approach as a way to illustrate how to use problem solving as a real-world application.

Session 6 will have 2 parts. First, groups will focus on "planning ahead;" that is, taking the skills applied to the problem chosen and anticipating how they might be used to develop a plan for addressing other cardiovascular risk issues. This will, again, be performed by sharing an actual problem for one of the members. Then the patients will be debriefed, reflecting on what about the intervention was most helpful for them going forward and potentially for other similar patients.

D.5.f. Phone Call Content. Unlike the group sessions, which will teach skills and techniques designed to be applicable to a large number of patients, phone calls will be designed for the phone coach to work with patients on their individual goals and plans. Calls will take approximately 10 minutes each, and will take place during the second week after the group meeting.

Early phone calls (ordinarily the first two, depending on individual patients) will predominantly work on goal-setting. The coach will briefly review the material from the most recent group session. Then, the coach will attempt to help the patient choose a specific, achievable, measureable prevention goal. By the end of the first call, the goal should be very specific (ie, "exercise 4 days a week for at least 30 minutes" as opposed to "exercise more") and the phone coach and the patient should have settled on a plan. The action plan will be specific, and will include a "how when, and where" for achieving the goal. This allows later calls to assess the success of the plan in accomplishing the goal. During these calls the phone coach should check on measureable progress (eg, weight loss) as well as assessing if any changes should be made in the plan if the goal is not being approached.

The phone coach will be performing two basic functions in providing this assistance. First, the coach should be able to use appropriate techniques to motivate the patient to meet her/his goal. The coach should attempt to help the patient identify both facilitators and barriers to meeting the goal (note that these barriers are specific to the goal and often external, and not the internal barriers general to problem-solving that are addressed in group session 1). Second, the coach should have appropriate resources available to overcome these barriers. Our previous work has developed a taxonomy for typical external barriers to usual cardiovascular risk reduction activities, such that 95% of patient's cited barriers are covered by this taxonomy (25). The phone coach will be equipped with a list of techniques and resources to overcome these barriers. The resources may be VA-based, but community resources will also be provided for those who for whatever reason prefer to use them. Examples of community resources would include health clubs with affordable pricing, websites with healthful recipes, and stress reduction classes.

D.5.g. Rationale for intervention above and beyond existing VA risk factor-specific groups. The VA has already developed strategies for addressing individual cardiovascular risk behaviors, including many behavioral groups. A partial list of these would include: MOVE!; smoking cessation group clinic; group medical clinics for hypertension; group lipid management clinics; nutrition consults; and any number of medication management clinics. However, none of these interventions has a perfect hit rate; the majority of patients who go to smoking cessation clinic fail to quit, the large majority of patients referred to MOVE! fail to lose weight, and SMGs make only modest improvements in risk reduction. Our intervention can be thought of as a co-factor for success in these other groups. Problem-solving seeks to explore what it is about people that makes them unable to take up the plans offered by these groups, and helps them change so that they can benefit from these groups, or other structures for risk reduction. Indeed, we expect that for some of our patients, the plan chosen to achieve a goal will be an existing VA risk reduction structure (e.g., if the goal is

increased physical activity, we expect some patients' plan to be MOVE! enrollment). However, we expect them to be more ready to succeed in MOVE! than had they been enrolled prior to our GPC intervention.

VHA has also implemented a number of risk-factor specific groups that use medication management as part of the intervention (Shared Medical Appointments). While these strategies have been used successfully (eg, 11), these interventions are expensive ($460/patient/yr, (11)), and many patients in primary prevention settings will not require medication management, leaving the expensive prescribing provider with little to do.

D.6. Control Group. Control patients will receive usual care and will have the same scientific protocol as intervention patients.

D.7. Interventionist Training and Oversight. The group facilitator will either be the facility's HBC, and thus be already fully trained, or an MSW who will be trained exactly as the HBC would be. This training begins with a self-guided, web-based orientation to being an HBC. Then follows TEACH facilitator training, which is a 2.5 day face to face training in health coaching and general patient-centered communication skills. After that, the group interventionist will complete training in MI, 24 hours over 3 days.

The phone interventionist will receive formal training in MI; we have purchased this service from a local MI teacher for numerous other personnel on other successful protocols (25). S/he will also receive training in coaching from professional coaches at Duke University Medical Center (3).

Dr. Nieuwsma, who is the investigator with experience in problem solving (see budget justification for credentials) will supervise the interventionists. *To assure fidelity, all intervention group sessions and phone calls will be recorded, and those that are randomly chosen to be overheard by Dr. Nieuwsma will be overheard after they occur. This eliminates a Hawthorn Effect for behavior of the interventionists when they know they are being observed. Second, we will establish checklists for both behaviors addressed and Problem-Solving approaches used in each session so we have a summative evaluation of intervention fidelity.*

D.8. Measures.

D.8.a. Primary Outcome Variable. The primary outcome is Framingham Risk Score, which yields a probability of major cardiovascular event over the next 10 years as its output (64). The inputs to FRS are: age; gender; diabetes status (which will be 0 at baseline for all enrolled patients); total and HDL cholesterol, which will be measured directly by standard VA laboratory methods; smoking status, measured by self-report; use of blood pressure medications, measured by VA medical record and self-report, and systolic blood pressure. All components of the FRS will be measured at each study visit. At each visit, two measurements of blood pressure, taken seated after a 5-minute rest and at 5-minute intervals, will be obtained. The final outcome will be the average of the two measures. All BP measurements will be performed using electronic blood pressure cuffs (148). Study personnel will be trained in measurement technique using established methods (149).

D.8.a.i. Justification for primary outcome. Patients in the intervention arm may choose one of a number of behaviors to work on, with no obvious common outcome across all potential behaviors (for example, someone who quits smoking has probably improved her/his cardiovascular risk even if s/he gains 10 pounds). Thus, a direct measure of risk is needed, and FRS is the best validated of these. Also, we have experience with successfully improving FRS in coaching interventions (3).

D.8.b. Secondary measures. Several measurements will be made that are not inputs to the primary outcome (FRS). Some are behavior change outcomes of the study, some are designed to assess possible mechanisms of action of the intervention, and some are potential analytic covariates or population descriptors.

D.8.b.i Secondary Outcomes. All secondary outcomes will be ascertained at all time points. For each outcome, the listed reference(s) refer to studies validating the measures. We recognize that, given that different patients may choose different behaviors to change, that we will have diminishing power to see change in these behaviors; nonetheless, the demonstration of modest, potentially not quite significant change across a number of behaviors is important confirmation of how any change in FRS may have occurred.

D.8.b.i.a Exercise. One of the goals of the intervention will be to increase the amount of leisure-time exercise performed by those patients who are not exercising to appropriate standards. Leisure-time activity will be measured by the International Physical Activity Questionnaire (IPAQ), a well-validated physical activity inventory commonly used in studies with the goal of changing leisure-time activity (70). Results can be expressed as metabolic equivalents. We selected this measure because it has been validated against a more objective method (i.e., accelerometer), yet it has the advantage of being convenient and cost effective as a self-report method.

D.8.b.i.b. Caloric Intake. The sentinel impact of diet on cardiovascular risk is weight loss (71), which leads to significant improvement in blood pressure and lipids. Therefore, one measure of salutary diet

change in this study will be weight. We will measure height at baseline, allowing us to use body mass index as an estimate of appropriateness of weight for each individual. To capture salutary dietary changes not encompassed by weight loss (e.g., decreased fat intake), we will use the Block Brief 2000 Food Frequency Questionnaire (FFQ), which was developed from the National Health and Nutrition Examination Survey (NHANES) III food intake data (72, 73). The questionnaire is a reliable and valid self-report dietary intake instrument, and provides information on intake of macronutrients, which will be our dietary outcomes. We will measure saturated fat as our dietary change outcome.

D.8.b.ii. Cost. The intervention, while not enormously expensive because of its use of relatively affordable personnel, will not be trivially inexpensive. In considering the implementation of GPC, stakeholders will want to know whether they are getting appropriate "bang for their buck." While full cost-effectiveness analysis is beyond the scope of this proposal, we will perform simple direct cost analysis of the intervention so that appropriate cost-benefit analyses can be undertaken under separate funding should the intervention be effective. Effects on utilization will not be considered as part of this proposal. We will measure only intervention-related labor for this study; our prior works shows that intervention-related capital costs are trivial in similar interventions (11). To measure hours required for the intervention, 4 people will carefully log their hours in delivering the intervention (including development) in a spreadsheet. The group interventionist will log time associated with performing and preparing for group sessions; the LPN will log phone call time and any time associated with documentation for the phone call; the RA will log only that time spent scheduling group sessions; and Dr. Nieuwsma will log supervisory time. Costs will be determined by multiplying these hours by the hourly grade/scale rate for the relevant person (using the appropriate fringe benefits multiplier). Time spent on research activities (ie, data collection and management) will not be logged.

D.8.b.iii. Process variables. We are interested in the contribution to GPC's efficacy, if any, of three process variables; group dynamics, and individual patient resilience.

D.8.b.i.a Self-efficacy. Self-efficacy involves a "judgment of one's abilities to produce given attainments." Individuals who believe they possess the skills necessary to achieve goals are more likely to adopt healthy behaviors (40, 41). Measures that measure self-efficacy across a range of behaviors are hard to find; our choice is the Patient Activation Measure (PAM), a 13-item measure that assesses patients' knowledge, skills, beliefs and confidence for managing their health (74). As a primary outcome measure in clinical trials, improvement in PAM scores has led to improvement in various self-management behaviors; a 4-6 point difference is felt to be clinically meaningful (75-78).

D.8.b.iii.a. Group Cohesion. We will measure patients' perception of their cohesion with the group in intervention patients only by using the Group Cohesion Scale. The GCS is a 6-item measure with good internal validity (53) and correlation to individual performance in workplace settings (35). We will evaluate whether GCS scores are related to improvements in FRS among intervention patients.

D.8.b.iii.b. Resilience. We will evaluate whether Connor-Davidson Resilience Scale (CD-RISC) scores are related to improvements in the primary and secondary outcomes (79). This 25-item scale is one of the most widely used scales to measure resilience in physical health settings. A methodological review of existing resilience measurement scales (15) indicated that the Connor-Davidson Resilience scale (full 25-item version) was one of three measures that received the best psychometric ratings

D.8.b.iii.c.. Med adherence. A 3-item validated questionnaire

D.8.b.iii.d. Social Problem-Solving inventory A 25-item questionnaire.

D.8.b.iv. Covariates. We will measure a number of demographic factors at baseline only that may affect response to the intervention, including race, age, marital status, education level, gender, adequacy of annual income, and number of people living in the household. All will be measured at baseline by self-report.

Body Mass Index (BMI): Patient is weighed using a digital scale that provides a print out. The patient's weight is entered from the printout (valid range is from 100-700 lbs). Height is measured twice and entered twice. If two heights are more than 0.5" different, then height is measured a 3rd time. Weight is then entered a 2nd time from the printout (i.e., a real-time double data entry). If the two weights are not exactly the same, the RA chooses the correct weight. The two closest heights & the correct weight are used to calculate BMI. BMI will be collected in person at the enrollment and 6 month visits with the research assistant.

D.8.b.v. Other Measures. Short Form Health Survey (SF-1)[36]: question 1 on self-rated general healthPatient Heath Questionnaire (PHQ-8) [37] to measure current depression Tobacco Use/Smoking: Measure from the CDC Adult Tobacco Survey[38] asking if they have ever smoked (100 cigarettes in your entire lifetime) and a

second question on current smoking (in the last 7 days) from the Behavioral Risk Factor Surveillance System (BRFSS) [39]Alcohol Use Disorders Identification Test (AUDIT-C)[40]: a 3 question alcohol screen that can help identify hazardous drinkers for those with active alcohol use disorders (including alcohol abuse or dependence).Physical Activity (Exercise Vital Sign)[41]: Two questions to measure days and minutes per day an individual engages in moderate to strenuous exercise. Pain: Three questions on the number of days pain interfered with your life within the past 30 days (question from the CDC HRQOL Healthy Days Symptoms Module[42]), the amount of pain today (EuroQol EQ-5D-5L [43]), and pain intensity (VA numeric rating scale from 0 no pain to 10 worst pain imaginable[44]) Sleep: 4 questions assessing quality of sleep

D.9. DATA ANALYSIS.

D.9.a. Descriptive statistics. Descriptive statistics, including graphical displays, will be used to summarize all study variables overall and by intervention arm. Evidence of imbalance in baseline characteristics will be noted and discussed as to whether they are clinically significant. As recommended by CPMP guidelines (80), we will consider sensitivity analyses adjusting for these baseline characteristics to ensure that an observed intervention effect is not due to this baseline imbalance. We will construct individual and mean trajectory plots of the longitudinal outcome variables (e.g., FRS) to understand their general trends over the study period. In addition, we will explore the variability and correlation structure of the longitudinal outcome variables. All statistical analyses will be performed using the SAS software package; the Durham HSR&D COE maintains the current SAS release on our system.

D.9.b. Missing Data. Because the main predictors of interest, intervention arm and demographics, are collected at baseline, we do not anticipate much missing data in these variables. There may be missing values in the outcome measures due to drop-out, a missed interim assessment, or item non-response. Given a thorough understanding of the missing data mechanism, it is possible to use all of the available information in analysis, rather than using only subjects with completely observed information. Our main analysis technique, general linear mixed models via maximum likelihood estimation, implicitly accommodates missingness when missingness is due either to treatment, to prior outcome, or to other baseline covariates included in the model (81), defined as missing at random (MAR). Therefore, inferences will be valid even if we have differential dropout by intervention arm. If the missing values are related to other measured patient factors, such as age, gender, or employment status, then multiple imputation (MI) provides a framework for being able to incorporate information from these auxiliary variables while still preserving a parsimonious main treatment effect model (82) and is described as a significant advantage in recommendations from Panel on Handling Missing Data in Clinical Trials (2010) (83). Depending on the type and scope of missing data MI will be conducted via the SAS procedure PROC MI or the SAS macro IVEware (http://www.isr.umich.edu/src/smp/ive/) (84). If the probability of dropout is related to the actual missing response (which is unobserved because it is missing) or to other unobserved quantities, the missing data due to dropout is considered missing not at random (MNAR) or nonignorable (85). There is a possibility that data may be MNAR, and we propose as additional sensitivity analyses to explore MNAR methods, including selection and pattern-mixture models as recommended by Molenberghs and Kenward (86).

D.9.c. Intent-to-Treat Analysis. All of the proposed primary and secondary analyses focus on the effect of GPC as compared to usual care. We, therefore, plan to use the intent-to-treat assumption for all analyses.

D.9.d. Primary Analysis. The GPC vs usual care comparison in Framingham risk score change from baseline to month 6 will be examined with the following general linear mixed model,

$$Y_{ijt} = \beta_0 + \beta_1 int*month6 + \beta_2 month12 + \beta_3 int*month12 + \beta_4 site + \beta_5 gender + \beta_6 smoking + c_j int*month6,$$

where Y_{ijt} is Framingham risk score for subject *i* in group *j* at *t*=month0, month6. We will estimate the parameters in the model using the SAS procedure MIXED (Cary, NC), and we will test to see if there is a difference in mean FRS change at month 6 between the GPC and usual care arm, i.e., $\beta_1 < 0$. The way time is coded in this model is often referred to as a constrained longitudinal data model (cLDA) (87) in which the month 0 risk is modeled as a dependent variable in conjunction with the constraint of a common month0 mean across the treatment arms. In this way, the cLDA model is comparable to an ANCOVA model; the two models are equivalent when there is no missing data. However, unlike an ANCOVA, subjects who are missing the month 6 measurement are included in the model because baseline is part of the response vector. As recommended by the CPMP (80), the model will also be adjusted for stratification variables of site, gender, and smoking status for improvement in precision. We will use an unstructured covariance to account for the correlation between repeated measurements, and we include a group-level random effect for intervention arm

patients, c_i, to account for the intra-class correlation between patients in the same prevention group. Similar procedures will be used to assess change through month 12 as a secondary analysis.

D.9.e. Aim 2 Analyses. Similar to the FRS, the secondary outcomes are all continuous and measured at baseline, month 6, and month 12. Analyses of these outcomes will thus proceed as describe above for FRS.

D.9.f. Aim 3 Analyses. The analyses for Aim 3 will only include the intervention arm patients and will be exploratory in nature. The primary outcome for these analyses will be change in FRS from baseline to month 6. We will consider multiple ways of characterizing group cohesion, including: each individual's group cohesion score at the last group session; each individual's change in group cohesion from the first to the last group session; and, the mean group cohesion score at the last group session. The relationship between change in FRS and group cohesion will be examined with a linear mixed-effects model, where additional predictors will include gender, smoking status, site, race, and age. A random effect for group membership will be included in the model to account for the intra-class correlation between patients in the same prevention group. Because the main predictors in these analyses are measured throughout the intervention, these analyses may be more impacted by drop-out or missed interim assessments than the Aim 1 and 2 analyses. We plan to use multiple imputation as the primary approach for handling missing data for the Aim 3 analyses.

D.9.e. Sample Size Calculations. The primary aim is to determine if there is a significant GPC vs usual care improvement in the mean FRS change from baseline to month 6. The clinically relevant mean FRS change is 2.0%. We assumed that FRS is normally distributed, and set the type-I error rate at $\alpha = 0.05$ and the type-II error rate at $\beta = 0.20$, representing power at 80% to detect significant differences.

To take the intra-class correlation (ICC) among the group members in the GPC into consideration, we applied the sample size procedures for group-randomized designs of Donner and Klar (88). Let m be the number of participants in each of the prevention coaching groups, and let ρ represent the ICC among the members of the group. In general, the minimum number of participants in each treatment arm is given by,

$$n = (Z_{1-\alpha/2} + Z_{1-\beta})^2 (2\sigma^2) [1 + (m-1)\rho] / (\mu_{GPC} - \mu_{UC})^2.$$

Here, Z_p is the p-th percentile from the standard normal distribution, while μ_{GPC} and μ_{UC} is the anticipated mean change for the GPC and usual care arms, respectively. However, this formula is not quite right for this study – the control condition is usual care, and no ICC is anticipated among its members. As a result, the formula is modified to,

$$n = (Z1-\alpha/2 + Z1-\beta)^2 \{\sigma^2 + \sigma^2 [1 + (m-1)\rho]\} / (\mu 1 - \mu 2)^2.$$

The first σ^2 in the braces corresponds to the variance for the usual care control group, while the $\sigma^2 [1 + (m-1)\rho]$ incorporates the design effect in GPC intervention arm (only).

The anticipated SD of the change in FRS was derived from previous studies, with a value of 6.3%. We have observed a baseline mean of 29% (SD = 14%) and a correlation between 6 month intervals of 0.9 (3). With respect to ρ, we have observed values in the previous studies of 0.03 (11). Finally, we took $m = 10$ as the average size of the prevention coaching groups.

Applying these assumptions results in a sample size of 180 per arm, or n=360 patients total. We further inflate the sample size to account for a possible 10% attrition rate by the 6-month follow up. **Therefore, we plan to enroll n=400 patients total to detect a 2.0% between-arm difference in the change from baseline to month with 80% power and a type-I error of 5%.**

D.10. DATA MANAGEMENT AND QUALITY CONTROL

D.10.a. Data Management Procedures. We will use a series of asynchronously connected database applications, over which a comprehensive data model will be deployed. Each database application will function independently as a discrete system. All data transactions within and between subsystems will run through secure transactions to ensure database integrity and privacy. Study data will be maintained on secure servers for the duration of the study and as long after the completion of the study as required by VA regulations at the time of study closure. All study data will be backed up on a nightly, monthly, and annual schedule.

All server hardware has built-in redundant systems. Technicians will constantly monitor server hardware, operating system and database service performance. Workstations, laptops, and any other devices will be supported in order to ensure high performance and secure operation. The primary database technology will be Microsoft SQL Server. All automated systems will run using the Microsoft SQL Server Management Agent. Automated processes will be monitored daily. The system will be configured to notify the HSR&D IT Group if an automated process fails to run successfully. The data collected during in-person interviews will be entered directly into our third party survey application named "DatStat Illume" running on an encrypted, password-protected laptop (www.datstat.com/). This survey application has been developed using Microsoft Visual

Studio Visual Basic Net. On the laptop, data will be stored in a series of XML files until daily synchronization with the Illume server. We have chosen DatStat Illume 4.7 because of industry standard acceptance as a reliable and flexible method for collecting and storing research survey information. All data collected can be exported into a number of standard formats including SAS, MS Access, and SQL Server. Server data will be backed up on a daily basis as well. We have used similar methods of data entry in our prior studies.

D.10.b. Data Quality. Use of the above electronic data management system will aid the research assistant (RA) conducting study visit to monitor which data collection instruments and questions have been completed by the patient. Though the computerized auditing procedure, the RA will determine if all questions have been answered. If not, the subject will be given the opportunity to answer questions. As with all study components, the study patient will have the opportunity to decline to answer any questions. Before the end of the study visit, the RA will complete a checklist to ensure that all measurements are completed.

Study implementation and quality assurance methods that we will be employed include: 1) careful scheduling and timely monitoring of the planned visit schedule to be certain that complete visits do occur; 2) collection of contact information for each patient at each visit; 3) prompt rescheduling of missed study visits; and 4) review and documentation of the reasons for missed visits that do occur. We will also review individual patient data promptly to identify problems or missing values that can be completed by follow-up.

D.10.c. Masking Procedures. All personnel will be unblinded to arm assignment EXCEPT (1) the Research Assistant gathering outcomes data, and (2) Dr. Jackson. The purpose of keeping Dr. Jackson blinded is to have him available to resolve issues regarding individual patients, where knowledge of arm assignment might compromise the unbiased nature of the decision. The purpose of unblinding Dr. Edelman is to allow him to use clinical judgment regarding adverse events or other clinical situations.

E. DISSEMINATION AND IMPLEMENTATION

Beyond the usual scientific presentations, our partnership with NCP presents us with a unique opportunity for rapid dissemination of our intervention, should it be effective. Our intervention was developed in direct partnership with NCP, and they had significant creative input into the intervention content. Also, our interventionists are mirror images of the HBCs hired by each VAMC with dollars provided by NCP, and NCP retains significant control over the roles of the HBCs at the facilities. Thus, if the intervention appears to improve primary prevention, NCP may use its influence over the HBCs to strongly suggest and support the implementation of the GPC intervention. Additionally, Dr. Edelman has experience in implementation of prior group interventional studies—he is currently assisting VISN 7 in implementing shared medical appointments in diabetes—and he will be willing and able to do the same for this intervention. Finally, CIH, which maintains a website, frequently leads trainings supporting Primary Care-Mental Health Integration, and hosts a VA mail distribution list (Mental and Behavioral Health in PACT), will further support dissemination of successful findings in collaboration with NCP.

F. PROJECT MANAGEMENT PLAN

We will recruit a total of 400 patients from the 2 participating sites (Durham, Buffalo) over a 24-month period. This will lead to at most 1200 patient encounters over the 2 years of enrollment plus follow-up for the study, or approximately 2.5 encounters per day. We propose a 48-month study (a Gantt chart is below). We request six months to finalize the interventions, protocols, and train personnel. There will be 24 months of recruitment in which in-person interviews will take place. Based on our prior experience on group visit studies, we will enroll 4 patients per week for a total of 400 patients in 24 months. Patients will then be followed for a total of 12 months. The final 12 months of the grant will also be devoted to planning analyses, writing data analysis programs, preparing data for archiving, and preparing reports.

	1-6 month	7-12 month	13-18 month	19-24 month	25-30 month	31-36 month	37-42 month	43-48 month
Intervention programming	*							
Hiring, training	*							
Patient Recruitment		*	*	*	*			
Intervention		*	*	*	*	*		
Follow-up visits			*	*	*	*	*	
Data entry & cleaning			*	*	*	*	*	*
Analysis/Manuscripts							*	*

Protection of Human Subjects

A. Risks to Human Subjects

1. Human Subjects Involvement and Characteristics.

This study will involve human subjects who participate in a randomized controlled trial. We plan to enroll 400 subjects (200 from the Durham VAMC, and 200 total from Buffalo and Syracuse VAMCs). We will enroll subjects from the overall populations at these VAMCs. Inclusion criteria will be a diagnosis of inadequately controlled hypertension, or inadequately controlled dyslipidemia, or current smoking. We will exclude patients any personal history of CAD or other major cardiovascular disease, cerebrovascular disease, peripheral arterial disease, or diabetes. We will also exclude patients with other severe intercurrent illness or poor life expectancy, including any malignancy being treated except for hormone treatment for breast or prostate cancer, renal dialysis or cirrhosis of the liver, psychiatric hospitalization within the last 3 years, or requirement for oxygen at any waking hour. Finally, we will exclude patients who reside in a nursing home, are severely impaired in hearing or speech, have significant cognitive impairment, do not have access to a telephone, or are participating in a prevention program. We will not involve any special classes of subjects, such as fetuses, neonates, children, prisoners, or institutionalized individuals. We will exclude pregnant women for scientific rather than safety reasons, because our primary outcome, Framingham Risk Score, is affected by blood pressure, which is affected by pregnancy in a way that is not biologically relevant to what we are trying to evaluate.

2. Sources of Materials.

The following human subjects related data elements will be collected for this study, with the source(s) of information noted:

- Diagnoses, smoking status, medications, previous blood pressure, previous labs (VA electronic medical record)
- Subject demographic and clinical characteristics, including age (collected as date of birth), gender, race / ethnicity, income, education level, employment, disability status, and marital status (subject self-report)
- Subject health-related information, including patient activation, general health, diet and physical activity, smoking status (patient self-report)
- Subject height, weight, and blood pressure (measured by research assistant); subject cholesterol (measured by local facility laboratory)

Only individuals officially assigned to the study team will have access to individually identifiable information about human subjects. This will include the principal investigators, co-investigators, project coordinators, statisticians, computer programmers, research assistants, coaches, and other appropriate staff. All of study team members will have completed VA's required human subjects training and will be included on a staff listing with the Durham, Buffalo, or Syracuse VAMCs IRBs, as needed.

Some data described above (i.e., health conditions noted in VA medical records) will be accessed from information already collected as part of usual care. All additional data collected from subjects will be specifically for the proposed research project and not a part of clinical care.

3. Potential Risks.

- Physical Risks. We do not anticipate any significant physical risks to be associated with participation on this study. The focus of the intervention is helping patients prepare themselves for changing unhealthful behaviors. This may include diets or exercise programs chosen by individual patients; while it is possible that exercise or physical activity can result in accidents, or in exacerbation of conditions such as arthritis

and angina, each of these programs has their own set of criteria for excluding patients which we will not alter.

- Psychological Risks. We also do not anticipate any substantial psychological risks to be associated with participation in this study. Our assessments will not ask participants any questions traditionally thought of as uncomfortable, such as those relating to traumatic exposures or to their current mental health. While it is always possible that some participants may feel uncomfortable answering any questions in an assessment, they will always be allowed to skip questions. We will only ask questions that involve data that are important for study outcomes, and we will inform patients that they may refuse to answer any questions, but still be involved in the study. Participants will also be informed that if they choose to discontinue the study at any time, this will not interfere with their usual medical care.

  If a patient divulges suicidal ideation at any in person visit, a provider with VA privileges, either a mental health provider or Dr. Edelman, will be asked to perform and document an assessment of the seriousness of the suicide risk; as a non-mental health provider, Dr. Edelman will use the structured VA suicide assessment tool. If no study provider is available, the patient will be escorted to the Emergency Department. Patients found to have more than minimal risk of imminent suicide on assessment will be also escorted to the Emergency Department. An adverse event will be reported within 5 days if the Emergency Department is involved, or if a privileged mental health provider determines that s/he provided therapeutic intervention that lowered the risk of suicide to where the patient is safe to go home.

  If a patient divulges suicidal ideation over the phone, a warm handoff will be conducted to the VA crisis line, and an adverse event will be reported within 5 days.

  If a patient divulges homicidal ideation at any in person visit, without an identifiable target, a provider with VA privileges, either a mental health provider or Dr. Edelman, will be asked to perform and document an assessment of the seriousness of the lethality of the threat. If no study provider is available, the patient will be escorted to the Emergency Department. Patients found to have more than minimal risk of lethality of threat on assessment will be also escorted to the Emergency Department. An adverse event will be reported within 5 days if the Emergency Department is involved, or if a privileged mental health provider determines that s/he provided therapeutic intervention that lowered the threat of violence to where the patient is safe to go home.

  If a patient divulges homicidal ideation over the phone without an identifiable target, a warm handoff will be conducted to the VA crisis line, and an adverse event will be reported within 5 days.

  If a patient divulges homicidal ideation with an identifiable target, the person hearing the threat will immediately contact the relevant authorities. If this threat occurs in person VA police will be called, ideally by using a panic button or other method that allows the study personnel to maintain control of the situation with the patient. If the threat occurs on the telephone an attempt will be made to determine where the patient is, followed by a 911 call. Once the situation is controlled Dr. Edelman will be called and he will contact the threatened individual.
- Financial, Legal, or Other Risks. There are no financial or legal risks associated with this study. Since personal data will be collected as part of this study, there is a risk of loss of confidentiality. However, we will take several measures to minimize this risk. First, we will only collect the data necessary for the study. Second, all electronic data will be stored on a secure VA server, rather than on individual desktop or laptop computers. Third, electronic study data will be kept in folders and databases that are only accessible to key personnel who are IRB-certified and whose job functions require access to these data. Fourth, all paper copies of data (i.e., consent forms) will be stored in locked cabinets and offices. Any paper documents that must be transported to / from clinic enrollment sites will be carried in a locked briefcase.

B. Adequacy of Protection Against Risks

1. Recruitment and Informed Consent.

Participants will be recruited via a 3-step process we have utilized in previous studies. First, for patients enrolled in primary care, we will identify patients with appropriate inclusion criteria, as well as the absence of any exclusionary diagnoses, via VA electronic medical records. Second, we will mail introductory letters to patients who meet these criteria. These letters will provide basic information about the study and will inform patients that a study team member will call them to provide more information about the study and ask whether they are interested in participating. The letter will also provide patients with a telephone number they may call to leave a message saying they are not interested in participating and do not want to receive a call from the study team. Third, unless we have received an “opt out” telephone call from a patient, a study team member

will call to provide additional details about the study, assess the patient's interest, and conduct a brief screening questionnaire to assess eligibility criteria that are not captured in VA electronic medical records. We will only ask a limited number of questions that are needed to determine study eligibility. Eligible, interested participants will then be asked to meet a study team member at their clinic (in conjunction with a regularly scheduled visit whenever possible) for informed consent, HIPAA authorization, and completion of baseline assessments. We will request a waiver of consent from the IRB to conduct recruitment activities described above, including identification of potential participants via ICD-9 codes, mailing letters to participants, and conducting a brief telephone eligibility screener.

As part of the in person consent process, a study team member will read the full consent form with the patient and provide as much time as needed for the patient to ask any questions they may have about the study to help ensure a fully informed decision. As part of the consent process, participants will be informed about the following (in accordance with VA IRB guidelines): purpose of the study, principal investigator of the study, sponsor of the study, duration of the study, number of people involved in the study, activities involved in the study (including assessments, randomization, and possible interventions to which they may be assigned), risk and benefits of participating in the study, alternatives to participating in the study, information about how study information will be kept confidential, costs (none) and compensation for study participation), participant rights to decline participation or withdraw from the study, and contact information for study personnel.

Following informed consent patients will have all baseline measures obtained in person including surveys, height, weight, blood pressure, and lipid panel.

2. Protections Against Risk.

We do not anticipate any significant physical, psychological, financial, or legal risks with participation in this minimal risk study. In order to minimize any risks regarding privacy of individuals and confidentiality of data, we will take specific measures to protect both paper and electronic data. Except when required by law, participants will not be identified by name, social security number, address, telephone number, or any other direct personal identifier in study records disclosed outside VA Health System. All electronic data will be stored on secure VA servers in folders and databases accessible only to study personnel whose job functions require access to this information. We will minimize the use of paper data collection by entering information from telephone screening interviews, baseline and follow-up assessments, and intervention tracking directly into a computer database. Any paper-based documents (i.e., copy of consent form) will be stored in a locked filing cabinet in a locked office. We have used these data security procedures successfully in multiple prior studies.

We will follow IRB-specified procedures for reporting adverse events to the VA IRB.

C. Potential Benefits of the Proposed Research to Human Subjects and Others

It is possible that participants may not experience any direct benefit from participating in this study, and this will be clearly stated in the informed consent document. Participants may experience benefits from the group prevention intervention, but we view this trial with equipoise and will not lead participants to believe that they will certainly derive benefit. Participation in this study will also lead to information that will help others in the future. This study is of minimal risk to participants, involving no invasive testing and not interfering with usual medical care. Therefore we believe the risks to subjects are reasonable in relation to the anticipated benefits to research participations or others.

D. Importance of the Knowledge to be Gained

This study will be the first to examine an intervention a group problem-solving intervention for primary prevention. Findings will provide information about the logistics, feasibility, and effectiveness of the intervention across VHA. This study is a minimal risk study and because of the potential benefits to both patients and VHA, we judge the risks to subjects to be reasonable in relation to the importance of knowledge that reasonably may be expected to result from the study.

E. Inclusion of Women and Minorities

Veterans of both genders and all racial and ethnic groups will be eligible to participate in the study.

Historically, this study group has had great success in minority enrollment at the Durham VAMC; we typically enroll 40-50% African-American subjects, which is slightly higher than the prevalence in our overall patient population. Due to our having a Women's Health Clinic at Durham, we are able to enroll approximately 10% women in most studies in our research unit. We expect similar results in Upstate New York, understanding that minority enrollment will be somewhat lower due to a lower prevalence of minority status in the overall population; nonetheless, our race-blind, outreach-based enrollment approaches will likely result in minority enrollment 5 percentage points or so above the underlying prevalence in the population.

F. Data Security Addendum for IRB. In this two-site study, all data will reside behind the VISN 6 firewall; Buffalo personnel will be given access to study-specific VISN 6 secure data sites and all data will be entered directly to the Durham VAMC. This eliminates need for data transfer within the VA and thus minimizes security risks.

Paper files will be stored in Rm 636 of the Legacy building, VA leased and approved space.

All intervention software and all databases will be managed using Illume software, as with all other HSR&D projects. No data will be stored on PC hard drives; only servers will be used for data storage. No mobile devices are used. All servers are located behind two layers of secure doors on VA leased space on the 6th floor of the Legacy building (see page 14 for more information about server security). The server name and file location: vhadurhsrdfile1\create\GPS. Data will be destroyed in accordance with VA policy. As soon as researchers are no longer members of the study team their access to study data will be removed. Any information security breaches will be reported per VA policy.