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Depression Treatment in HIV-infected and Uninfected Veterans: Do Treatment Rates Vary by HIV Status?

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ABSTRACT

Background: Despite a higher prevalence of depression among HIV-infected veterans, previous research has shown that infectious disease (ID) providers report substantially less comfort with depression treatment than do general medicine (GM) providers. We examined whether HIV-infected veterans who are treated by ID providers are less likely to have their depressive symptoms treated compared to uninfected controls managed by GM providers.

Methods: We used survey, service utilization, and pharmacy data on veterans from the Veterans Aging Cohort Study (VACS), a prospective cohort study of HIV-infected and age-, race- and site-matched uninfected subjects at 8 Veterans Affairs Healthcare Centers. We used the Patient Health Questionnaire (PHQ-9) to identify veterans with depressive symptoms. Each of nine survey items was rated by the veteran as being present "0" (not at all) to "3" (nearly every day). Veterans were considered to have active depressive symptoms if they had a PHQ-9 score of 10 or greater, which constituted a positive screen for major depressive disorder. Of the 5998 VACS patients, 19.7% of uninfected and 21.3% of HIV-infected veterans had PHQ-9 scores of 10 or greater. Of these veterans with active depressive symptoms, those receiving mono-amine oxidase inhibitors (MAOIs) (n=3), female veterans, and men with diagnoses of schizophrenia (n=511) or PTSD (n=689), were excluded. A small number of patients receiving tricyclic antidepressants (TCAs) were excluded for criteria other than TCA use. Depression treatment was defined as receipt of a selective serotonin reuptake inhibitor (SSRI) or any VA mental health utilization in the 6 months prior to or after survey. Bivariate comparisons by clinic type were assessed using chi-square and t-tests. Logistic regression was used to determine whether clinic type was associated with receipt of SSRI, adjusting for potential confounding variables such as demographics and clinical factors.

Results: Of the 5998 veterans in VACS, 732 met our criteria with PHQ-9 scores greater than 10, male gender, without schizophrenia, PTSD or MAOI use. Of the 732 eligible veterans, 59% were HIV-infected and 41% were uninfected. The sample was predominantly African-American (58%) and had a median age of 48 years. There was no significant difference in the proportion of veterans with depressive symptoms who were treated by HIV status (38% of HIV-infected veterans vs. 34% of uninfected veterans, $p=0.4$). This remained true even when mental health service utilization was included (48% vs. 49%, $p=0.8$). Caucasian veterans were significantly more likely than African-Americans to have received SSRI (48% vs. 30%, $p<0.01$). After controlling for veteran

age, race, and comorbid conditions, HIV-infected veterans did not differ significantly in receipt of SSRI (OR=1.16, 95% CI=0.84, 1.58). However, there were significant differences in treatment rates by site and by individual clinic.

Conclusions: Despite previous analysis demonstrating substantial differences in provider comfort with depression treatment, both HIV-infected and uninfected veterans were equally unlikely to be treated for depressive symptoms. While treatment rates did not vary by HIV status, they varied significantly by geographic site and individual clinic, suggesting that provider practices have considerable influence over receipt of treatment.

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INTRODUCTION

This thesis examines a specific general medical condition – depression – and its treatment in two primary care populations: HIV-infected and uninfected matched veterans. Primary care physicians (PCPs) have taken responsibility for screening and treating uncomplicated depression. Yet, based on lower provider-reported comfort with depression treatment by Fultz et al (2006) between general PCPs and HIV PCPs, we have reason to believe that depression may be less aggressively managed in HIV primary care than it is in general medical primary care (1). Thus, with this study, we examine whether HIV status correlates with a difference in treatment of self-reported depressive symptoms among HIV-infected and uninfected veterans by their primary care providers.

Depression Treatment is Valuable on a Societal and Personal Level

Many researchers argue that all depression should be treated because of its staggering indirect costs to society. In its "Global Burden of Disease Study," the World Health Organization (WHO) predicts that depression will be the second leading cause of disability in the developed world by 2010 (2). It cites depression as the leading cause of years lived with disability and the fourth leading cause of burden among all diseases (2). Depression incurs innumerable societal costs, including decreased productivity from missed work days and increased use of health services (3). Health care costs for depressed older adults are more than 50% higher than for older adults without depression (4).

On a personal level, depression affects medical outcomes, quality-of-life and treatment compliance (5). Depression can indirectly worsen medical outcomes. Poor

motivation and altered concentration can lead to poor compliance with medical treatment plans (6). There is evidence to suggest that depression can directly worsen medical illness, for instance by dysregulating neurohumoral pathways and increasing platelet activation in veterans with ischemic heart disease (7). Depression treatment can improve quality of life and functioning, even in adults with complex chronic medical disease (4). Moreover, depression treatment can enhance self-management skills and enable patients to comply with complicated medical treatment regimens (8).

Depression is Widespread, but Underdiagnosed and Undertreated

Current literature describes depression as significantly underdiagnosed and undertreated (4;5;8;9). In a primary care setting, depression point prevalence can be as high as 10-14% (8). Robert Wood Johnson Foundation's "Depression in Primary Care" cites that only 50% of cardiac and diabetic patients with major depression are diagnosed and only 25% of those diagnosed receive treatment (8). Some researchers estimate that 30-70% of patients with major depression go undetected and less than 50% of primary care patients who are diagnosed receive appropriate treatment (9;10). These statistics suggest that the current individualized approach to depression diagnosis and treatment does not work very well. Many policymakers conclude that depression's high prevalence coupled with low rates of diagnosis and treatment call for population-based approaches (5;8;9;11).

Depression Treatment: Three Phases

Defining depression treatment is not straightforward because there are multiple treatment modalities and phases. Clinicians can choose from both antidepressants and psychotherapy, which have been shown to be superior to placebo and "usual care" (12).

In many of the treatment models, antidepressant medications are first-line treatment (4;5;9;13-15). It is estimated that for those patients who respond to antidepressants, 20-40% respond to active treatment, 30% to placebo effect and the rest to spontaneous remission of depressive symptoms (5). Antidepressant study attritionrates generally approach 30-40% and approximately 10-20% of patients drop out secondary to drug side effects (5). Researchers attribute the remaining drop-outs to patient and provider factors. Patients may have unrealistic treatment expectations, ambivalence and access issues (12). Providers may neglect to follow through and adjust medication dosing and type as needed to reach treatment goals (12).

Other treatment options include depression psychotherapy or combined therapy. Depression psychotherapy (including cognitive behavioral therapy, problem solving therapy and interpersonal psychotherapy) is clinically effective but not cost-effective (16). Depression psychotherapy plus antidepressants is the clinical gold-standard therapy (16). Unfortunately, as a society, we simply do not have enough manpower to offer psychotherapy to approximately 1 in 10 primary care patients estimated to have depression (17).

US Preventive Services Task Force and institutions such as the Veterans Health Administration recommend antidepressants as first-line treatment due to their short-term cost-effectiveness and fewer demands for human resources (9;18). Clinical research has determined that antidepressants are equally as effective as psychotherapy in treating acute episodes, inducing remission and preventing recurrence (5).

Beyond the multiple treatment modalities, current treatment recommendations describe 3 potential phases of treatment: acute, continuation and maintenance. The acute phase of outpatient treatment consists of either antidepressant therapy, or psychotherapy

or both, and typically lasts 6-8 weeks (5). The goal of this phase of treatment is to decrease a patient's depressive symptoms by 50% or more. Thus, the patient will no longer meet criteria for major depressive disorder.

The second phase of treatment is the continuation phase. Again, the options for treatment include antidepressant therapy, psychotherapy or both. Continuation phase is defined as 6 months of continued antidepressants with biweekly or monthly physician follow-up (5). The goal of continuation phase is to induce the patient's depression into complete remission to prevent relapse. Continuation treatment has been found to decrease relapse rates from 40-60% to 10-20% (5).

Finally, many patients require a maintenance phase of treatment to prevent recurrence of major depressive episodes. For maintenance therapy, providers may continue antidepressants or monthly or quarterly physician follow-ups (5). Maintenance therapy is recommended for patients with a history of 3 or more major depressive episodes, chronic depression or bipolar disorder (5;6).

A significant proportion of patients eventually require long-term depression maintenance therapy. Between 50-85% of those presenting with MDD will go on to have at least one lifetime recurrence, and a high proportion of these patients will require chronic maintenance therapy (19). Thus, when starting a patient on depression treatment, whether medication or psychotherapy, it is important to consider that many will continue to require that therapy for the rest of their lives.

Cost of Depression Treatment is a Formidable Barrier to Depression Treatment

The high cost of depression treatment affects how clinicians create treatment guidelines and influences patients, providers and health policymakers' clinical decision-making.

Though policymakers recommend increasing depression treatment rates, the significant cost of depression treatment limits our options. Researchers must address the question of where resources should be directed to make the biggest impact on depression outcomes. First, they must decide which therapeutic approach has the highest cost-effectiveness. The actual cost of SSRIs for depression treatment can vary considerably, depending on formulation and duration of treatment (Table 1). The figures in Table 1 are low estimates, derived by using the lowest recommended dose and the cheapest available formulation of each medication.

Table 1. Cost of SSRIs Depression Treatment[A]

SSRI (Formulation)	Cost of Treatment Per Month	Cost of Treatment Per Year	Dosing
Fluoxetine (generic capsule)	$15.99	$199.88	20 mg daily
Sertraline (Zoloft™ tablet)	$75.99	$911.88	50 mg daily
Paroxetine (Paxil™ tablet)	$90.50	$1086.00	20 mg daily
Fluvoxamine (generic tablet)	$62.99	$755.88	100 mg daily
Citalopram (Celexa™ tablet)	$72.99	$875.88	20 mg daily
Escitalopram (Lexapro™ tablet)	$70.15	$841.80	10 mg daily

[A] Prices taken from *Up To Date* "Drug Information" (20-25). The lower end of the recommended dosing range for depression was selected. The cheapest available form was selected, including generic versions, if available.

For veterans in the VA health system, pharmaceutical costs may not be important factors because medications cost them a low co-pay of approximately $8 per 30 day prescription (26). However, these costs are important to the VA health system as a whole. Although the VA is often able to negotiate lower drug prices by purchasing

inbulk, they pay significant overall prices to pharmaceutical companies for antidepressant medication.

A thorough discussion of depression treatment costs must address the significant profit that pharmaceutical companies make from current treatment recommendations. As more patients are screened and diagnosed with depression, pharmaceutical companies benefit further from higher antidepressant sales.

The issue of cost-effectiveness in depression treatment is not straightforward. Some policymakers argue that psychotherapy is cost-effective because it reduces hospitalization (16). However, only 5-10% of major depressive episodes require hospitalization (2;5). Others argue that antidepressants are more cost-effective because they do not require as many human resources (2). It seems that neither psychotherapy nor antidepressant cost analyses can adequately account for the large subpopulation of depressed patients who require lifelong maintenance therapy. With either treatment option, depression treatment for an estimated 10% of the American population for their entire adult lives would create astronomical healthcare costs. While it is unclear which depression treatment option is most cost-effective, it is clear that both therapies are enormously expensive.

Depression is Often Treated in Primary Care

In the modern U.S. healthcare system, primary care physicians serve as "gatekeepers" of medical resources for the general public (11). They assume responsibility for preventative medicine, seeking out common diseases before a patient may have reason to suspect that he has a health problem. In this sense, primary care is the logical field to address depression, which is widespread and often lacks obvious clinical findings and

patient insight. In a paper commissioned by the National Institute for Mental Health as part of their series, "Challenges for the 21st Century: Mental Health Services Research Conference," Benjamin Druss explains that primary care has the benefit of "first contact, longitudinality, comprehensiveness and coordination" (11). When individuals develop a medical problem, they first seek out the general knowledge offered by PCPs. Once patients interface with the medical system, they can create longitudinal relationships with PCPs. This relationship, in turn, contributes to better mental health care. A study by Gulbrandsen et al in a Scandinavian population found a positive association between a provider's knowledge of patients and provider detection of psychosocial problems (11). Thus, encouraging PCPs to address depression may enhance the rates of detection and treatment. New collaborative models of depression treatment have created a "therapeutic alliance" between PCPs and specialists to improve patient outcomes (4).

HIV Primary Care

In the United States, the availability of effective highly active antiretrovirals (HAART) therapy encouraged the development of a burgeoning field of medicine – HIV primary care. HAART increased the average lifespan after diagnosis of HIV-infected patients (27). After HAART, it was possible to imagine a future in which HIV-infected patients would live long enough to face general age-related medical diseases like the uninfected population (27). As HIV-infected patients aged, they addressed non-infectious medical issues such as cardiovascular disease, diabetes and depression with greater frequency. However, this special patient population required HIV treatment and prophylaxis too complex to be managed by most primary care physicians. The U.S. Department of Health and Human Services expressed concern about generalist competency in caring for

HIV patients; they recommended that generalists care for at least 50 HIV-infected patients to remain proficient in HIV care (1). Indeed, many ID specialists have taken over the role of both HIV specialist and primary care physician for their HIV-infected patients. This arrangement has become policy within the Veterans Health Administration. The designated primary care physician for HIV-infected veterans is the physician who manages their HIV infection. Thus, HIV care created a special circumstance in which many specialists assumed responsibility for primary medical care. This arrangement optimizes HIV care but has introduced questions as to specialists' competency in general medical care, as discussed by Fultz et al (1).

HIV and Depression

Depression is an important issue for providers treating HIV-infected patients. HIV-infected patients are twice as likely to be diagnosed with depression compared to uninfected patients (28). Untreated depression has been associated with poorer HIV-related outcomes, such as shorter survival times and increased use of HIV-related hospital services (29;30). Many recent studies have demonstrated that HIV-infected patients benefit from improved quality of life and HIV-specific outcomes by treating comorbid depression (6;28;31). The evidence seems to clearly indicate that providers should identify which patients are depressed in order to treat their depression and improve their health outcomes.

Yet, among patients with complex chronic disease like HIV, it is not straightforward to make a diagnosis of depression. Within the HIV-infected population, it is difficult to target subpopulations for screening; the risk for depression does not clearly correlate with disease severity, mortality or sexual orientation (28;31). Therefore,

universal depression screening for HIV-infected patients is recommended (28). Yet, universal screening has uncertain benefit in HIV-infected populations because current screening and diagnostic tools have questionable accuracy in patient populations with chronic medical illness. The American Psychiatric Association's DSM-IV includes specific somatic symptoms included in its formal depression diagnostic criteria (32). These somatic symptoms, termed "neurovegetative," are non-specific symptoms that can be attributed to either medical or psychiatric illness (Table 2) (6). Clinicians try to distinguish between cognitive-affective and neurovegetative symptoms to clarify whether neurovegetative symptoms should be interpreted as worsening medical disease or overlying psychiatric disease.

Table 2. Distinguishing between Cognitive Affective and Neurovegetative Symptoms of Depression[A]

Cognitive-affective Symptoms	Neurovegetative Symptoms
Anhedonia	Sleep change
Depressed mood	Fatigue
Low self-esteem	Appetite change
Suicidality	Concentration difficulty
	Psychomotor change

[A] These specific terms were referenced from Colibazzi et al (6).

This distinction becomes especially important in patients with chronic medical illness like HIV. In "Practice Guidelines for the Treatment of Psychiatric Disorders," the American Psychiatric Association acknowledges that clinicians face a diagnostic dilemma in separating mood disorders that stem from HIV neuropathic effects from true psychiatric disorders (33). Any number of HIV-related diseases and medications could induce neurovegetative symptoms or secondary cognitive-affective symptoms (6). For

HIV PCPs, there is no clear answer for how to discriminate between medical or psychiatric disease, or if this distinction is clinically important. For HIV PCPs and generalists alike, depression remains a complex clinical entity to diagnose and treat.

Is There a Difference in Quality of Primary Care by Generalists vs. Specialists?

A tension has developed between specialists and generalists regarding responsibility and quality of care in patients with chronic medical disease. Indeed, a study of medical care utilization patterns of elderly Washington State residents found that specialists play a large role in the outpatient care of elderly patients (34). Over the 2-year study period, 14.7% of the patients saw only specialists (34). However, this study went further to determine that specialists were not assuming the role of primary care provider to these patients. They only were addressing medical problems relevant to their specialty (34). With the fragmentation of the modern health care system, specialists are taking responsibility for a majority of outpatient care, but only addressing medical issues within their specialty field (34). These findings likely can be applied to any patient population with complex chronic medical diseases, which give patients the opportunity to establish strong relationships with individual physicians.

In the wake of this shift to outpatient specialty care, clinical researchers have compared the quality of care given by generalists versus specialists for given medical conditions. They have investigated whether patients with a primary chronic medical condition receive better care from a specialist than a generalist. Many studies of specialist fields such as cardiology, gastroenterology and infectious disease have demonstrated improved overall health outcomes by specialists (34;35). However, others argue that most existing studies have invalid designs; they are overly simplistic and do

not account for practice environment, patient volume or provider experience (35;36). Furthermore, ecological studies have demonstrated lower mortality rates and more equitable distribution of health in populations with many primary care providers, compared to those with many specialists (35). With the evidence at hand, it is unclear whether generalists or specialists provide better care for patients. In any case, it is difficult to apply current evidence to our study population because our patients have multiple comorbidities which complicate the clinical picture.

With this study, we endeavor to answer a different question. We do not compare how generalists perform to a specialist treating something within his own field. We compare how well specialists perform when treating general medical conditions that are not within their field of specialty. We contrast how infectious disease providers treat depression – widely considered a general medical condition – compared to generalists (5;8). We earlier discussed that specialists report lower comfort levels with treating general medical conditions, including depression. We investigate if lower comfort levels among specialists affect their clinical practice.

STATEMENT OF HYPOTHESIS

To investigate a potential explanation for why a large proportion of depressed patients remain untreated, this project investigates the role of HIV status. This study assesses differences in depression treatment between HIV-infected and uninfected veterans with active symptoms of depression. The incidence of depression itself has been demonstrated to be higher in HIV-infected veterans compared to uninfected veterans (28). However, a prior paper by Fultz et al suggests that the overall proportion of HIV-infected veterans treated for depression may be lower than the proportion of uninfected veterans because HIV PCPs report lower comfort levels with treating depression than do general PCPs. Fultz reports a significant difference in HIV PCPs' stated comfort levels with depression treatment (42%) compared to those of general medicine PCPs (79%). Therefore, if HIV primary care providers feel less comfortable with treating depression, it seems likely that HIV-infected veterans with active depressive symptoms will have lower rates of depression treatment than their uninfected comparators. Thus, this project will address the following question: what proportion of veterans who report depressive symptoms severe enough to screen positive for depression receive treatment and does this proportion differ by HIV status?

Specifically, we will consider the following questions:

1. Does the prevalence of active depressive symptoms vary by clinic type (which correlates directly with HIV status)?
    a. We hypothesize that the prevalence of veterans with active depressive symptoms will be higher in HIV-infected veterans compared to uninfected veterans.
2. How does the provision of treatment, given the presence of active depressive symptoms, vary by clinic type?

   a. We hypothesize that the provision of treatment, given the presence of active depressive symptoms, will be lower in HIV-infected veterans compared to uninfected veterans.

3. What might explain potential differences in rates of depression treatment?
   a. Some variables considered:
      i. Veteran demographics
         1. Age
         2. Race
         3. Marital status
      ii. Medical comorbidities
         1. Substance abuse/dependence (alcohol and drug)
         2. Medical illnesses (cardiovascular, pulmonary, endocrine)
      iii. Geographic site
      iv. Individual clinic

METHODS

The Veterans Aging Cohort Study (VACS) is a longitudinal prospective multi-center observational study conducted at the Veterans Health Administration. This study compares HIV-infected veterans receiving care in infectious disease (ID) clinic and age/race/site-matched uninfected veterans receiving care in general medicine (GM) clinic.

Veterans Health Administration

The Veterans Health Administration (VA) is the largest integrated health care system in the U.S., which provides care to 3.6 million veterans annually (37). It offers inpatient and outpatient general medical care as well as specialist care. The system includes pharmacies, mental health services, substance abuse treatment programs, long-term care, rehabilitation services and homeless care.

The VA is particularly suited to observational studies in populations with complex chronic disease (38). Its veteran population has a high proportion of underrepresented veteran groups, including those with a high degree of frailty, low socioeconomic status, people of color and the elderly (38). They also have a population of HIV-infected individuals who are, on average, 10 years older than the national average, as reported by the Center for Disease Control and Prevention (39). These veteran populations, in particular, are important to study because they are poorly represented in clinical trials. The VA system is large enough to assemble large cohorts with truly matched comparators. Due to its sheer size, the VA cares for the nation's largest cohort of HIV positive veterans, estimated at 19,000 veterans in 2003. As a

nearly closed system, its records contain all health care utilization for its veterans. Moreover, most of its patients remain in the same system for their lifetime. It provides a useful resource for clinical epidemiology with its nation-wide, fully-integrated electronic medical record (EMR) system. Moreover, it is defined by a corporate culture which strives to exceed performance measures set by private health care corporations (39).

Veterans Aging Cohort Study

The VACS study includes patients at 8 Veterans Affairs Medical Center (VAMC) sites: Atlanta, Baltimore, Bronx, Houston, Los Angeles, New York, Pittsburgh, Washington, DC (39).

The data included in this particular analysis was collected over a 2-year period from June 2002 to September 2004. As of September 2004, VACS consented and enrolled 5,998 veterans (2979 HIV-infected, 3019 uninfected). The study continues to enroll age/race/site matched comparators to replace those who have died or have been lost to follow-up. Study protocols were approved by institutional review boards at all involved sites. All study participants gave written informed consent.

Trained study coordinators recruited HIV-infected veterans from infectious disease clinics and age/race/site-matched HIV-uninfected veterans from general medicine clinics. Veterans were informed about the study, consented and then given a questionnaire to complete before leaving the clinic. By consenting, subjects gave permission for study investigators to access their EMR information and to re-contact them in the future (39).

The VACS sample represented 99% of the VACS targets, including targets set for age and racial/ethnic diversity. Only 9% of those approached refused to participate in the

study. This proportion was not significantly different by HIV status. In all, VACS enrolled 58% of all HIV-infected veterans seen in infectious disease clinics at participating sites (39).

In the short-term, this study aims to investigate outcomes associated with substance use, homelessness and medical and psychiatric disease in demographically-comparable HIV-infected and uninfected veterans (38). In the future, VACS investigators hope to use the data to create effective VA-wide programs based on risk assessments at a patient level and to prioritize health interventions (39).

VACS primary funding sources include: National Institute on Alcohol Abuse and Alcoholism (3U01 AA 13566), National Institute of Aging (K23 AG00826), Robert Wood Johnson Generalist Faculty Scholar Award, an Inter-agency Agreement between National Institute on Aging, National Institute of Mental Health and the Veterans Health Administration, and the Veterans Health Administration Office of Research and Development and Public Health Strategic Health Care Group (39).

Thesis Project

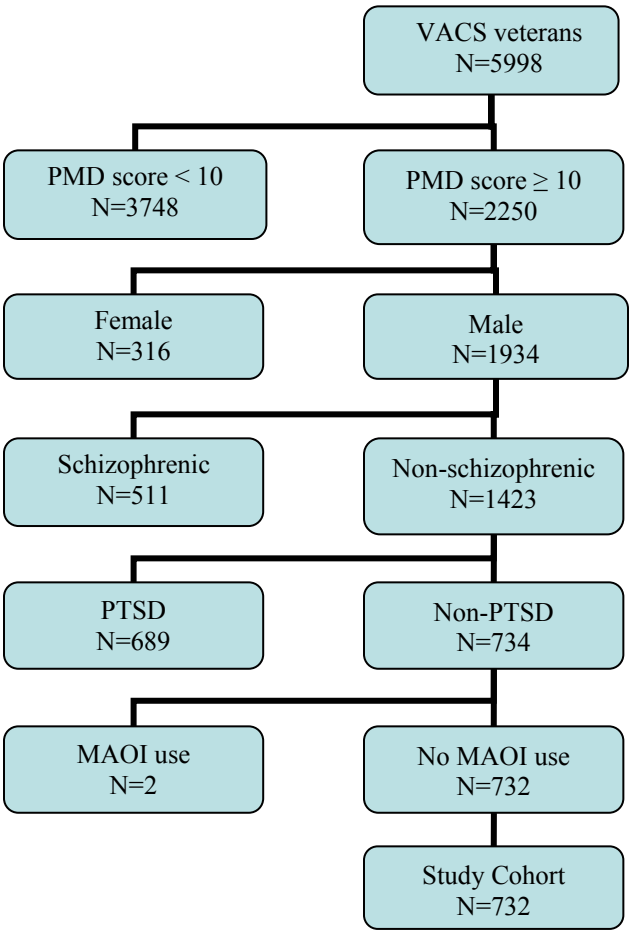
This study is a secondary analysis of cross-sectional data collected by baseline survey for the VACS data set.

Sample

Veterans were recruited from general medicine and infectious disease primary care clinics at 8 diverse VA sites. Veterans were compensated for their participation with $20 cash, given to them upon completion of the questionnaire. The VACS sample included 5998 veterans. Inclusion criteria consisted of participation in VACS study and a PHQ-9

score of 10 or greater (Figure 1). Among the 5998, 19.74% of GM patients, and 21.25% of ID patients had a PHQ-9 score of 10 or greater (p=0.1483). These veterans with active depressive symptoms were then excluded stepwise for the following criteria: female gender (n=316), diagnosis of schizophrenia (n=511) or PTSD (n=734) and MAOI use (n=2) (Figure 1). From the initial VACS sample, 2250 veterans met inclusion criteria for our study. Formal depression diagnosis was not taken into account as we wanted to include all patients with active depressive symptoms by our measure, whether or not they had been identified and diagnosed as such by their provider. Female veterans were excluded because of their small number. Those veterans with a diagnosis of schizophrenia were excluded as it is considered beyond the scope of primary care to treat depression comorbid with other complex psychiatric diagnoses. Veterans with a diagnosis of PTSD were excluded because PTSD can potentially be treated with SSRIs and we would be unable to determine if a provider prescribed an SSRI to treat depression or PTSD (40;41). As these psychiatric conditions are common within the veteran population, a large percentage of the male VACS subjects with PHQ-9 scores of 10 or greater were excluded for their psychiatric comorbidities. Veterans receiving MAOIs (n=3) were excluded due to contraindications of co-receipt of MAOI and SSRI. We considered excluding patients receiving TCAs from our sample because we would be unable to determine if patients received the medication for depression treatment or for another purpose, such as chronic pain treatment. However, we did not need to address this issue because only a small number of veterans in this sample received TCAs and they were all excluded for reasons other than TCA use. In total, 5267 (88%) of the original 5998 veterans in the VACS sample were excluded from this analysis.

Figure 1. Study Flow Chart



The final sample included 732 male veterans with depressive symptoms and no schizophrenia, PTSD or MAOI use. Race/ethnicity was gathered from administrative data (39). Veteran comorbidities were also determined from VA administrative data, and were grouped by categories. A veteran was considered to have a comorbidity if he was assigned the ICD-9 code at any time in his care at the VHA, not just the 1-year time frame of this study. The following categories included select conditions from the following ICD-9 codes (42):

- Alcohol abuse/dependence: 291, 303, 305, 790, 980, E860

- Substance abuse/dependence: 292, 292, 304, 305, E855, E858
- Coronary Artery Disease: 410-414, V45
- Diabetes mellitus: 250, 357, 790-791
- Hypertension: 401-405, 437
- Pulmonary Disorder: 416, 490-493, 500-506, 518, 770

These specific medical comorbidities were selected because of their association with high depression rates in recent literature (8). The number of median and mean comorbid medical diseases was determined from VA administrative data. In the HIV-infected population, the mean and median comorbid medical disease categories do not include their HIV diagnosis. HIV severity measures (mean and median CD4 count, viral load) were determined from VA laboratory data, as part of the EMR.

Data Collection

Data sources used in this analysis included the following: veteran questionnaires, VA electronic medical record and national data sources.

- Questionnaires were self-administered to each veteran. The questionnaires were compiled using standardized survey instruments (39). Many of the items were drawn from the national Veterans Health Survey, including questions for demographics, comorbidity, and healthcare utilization.
- The VA Electronic Medical Record (EMR) was accessed for medical and administrative data, including health care utilization data and ICD-9 codes. VA Computerized Veteran Record System (CPRS) provided demographic and clinical information such as laboratory data. The Pharmacy Benefits Management (PBM) database was a source of information regarding medication prescription, dose and fill dates.

Quality control was ensured by a standardized site team, adherence to a Manual of Operations and regular contact between all sites.

Measures

Current depressive symptoms were evaluated using Patient Health Questionnaire-9 (PHQ-9), a shortened version of PRIME-MD, a well-validated screening tool based on DSM-IV criteria for Major Depressive Disorder (MDD) (43). PRIME-MD survey items were drawn directly from DSM-IV criteria, and divided into threshold and subthreshold categories to correspond with 18 psychiatric diagnoses, including MDD. PHQ-9, a shortened version of the PRIME-MD which specifically addresses MDD, is valid for both criteria-based diagnosis and symptom severity evaluation (44). It includes the following domains: anhedonia, depressed mood, sleep change, fatigue, appetite change, low self-esteem, concentration difficulty, psychomotor change and suicidality (43). PHQ-9 has proven to be an effective screen for MDD in clinical trials in special veteran populations, such as those with multiple comorbid medical illness and from various ethnic and cultural backgrounds (43-46;46-49). Each veteran completed this screening survey upon entry into the VACS study. In the PHQ-9, each of 9 DSM-IV criteria was rated by the veteran as "0" (not at all) to "3" (nearly every day). As designated by Kroenke et al, veterans were considered to screen positive for MDD and were included in our sample if they had a total score greater than or equal to 10 (44). This cutoff point conferred 88% sensitivity and 88% specificity for the formal diagnosis of MDD (44). This simple scoring method was developed by Kroenke et al to optimize use of the PHQ-9 in a primary care setting without special training (44). While it was preferable to have a formal diagnosis of depression rather than the PHQ-9 results, which were intended as a screen rather than as a

means of making the diagnosis of depression, we had no reason to believe that the relative proportion of individuals with true depression among those testing positive with the screen would vary by HIV status. Thus, the relative comparison between those in HIV care and those in general medical care still should be valid. Veterans with PHQ-9 scores consistent with minor depression and dysthymia had less clear diagnostic criteria and treatment recommendations and were not addressed in this study.

Outcomes

Depression treatment was defined as receipt of an SSRI or visit to mental health clinic in the 6 months prior to or following the survey. The time frame was considered a reasonable window in which providers should respond to active depressive symptoms, including treatment initiated before the veteran was enrolled in the study. To clarify the analysis, this study focused on provision of treatment, as evidence that the provider responded appropriately to active depressive symptoms. We did not consider treatment effectiveness. We did not distinguish the source of the prescription, either from generalist or specialist. We considered at least one receipt of one prescription for SSRI or one visit to a mental health provider to indicate treatment. We included the following FDA-approved SSRIs:

- Fluoxetine
- Sertraline
- Paroxetine
- Fluvoxamine
- Citalopram
- Escitalopram

We collected data on receipt of SSRI, date of last fill and dose per day. Dichotomous variables were created, where "1" meant receipt of SSRI and "0" meant no receipt of

SSRI. A similar dichotomous variable was created for mental health service utilization with information gathered from the EMR.

Previous studies have demonstrated that 98-100% of VA veterans get their prescription medication from the VA outpatient pharmacies because they have very low co-pays and, thus, strong financial incentives (10). Of the VACS sample, 96% of enrolled HIV-infected veterans reported getting all of their HAART medication from VA pharmacies (39). Thus, it is not unreasonable to assume that if the eligible veterans received an SSRI from any VA provider within the time frame, we would detect this prescription via the pharmacy database. Likewise, because the VA is a nearly closed system, it is likely that any mental health utilization made for eligible veterans would also be documented via VA administrative data and detected by our data search.

Mental Health Professional in Clinic

A unique contribution of this thesis project to VACS data was a survey of clinic directors to determine their access to mental health providers. Each of the 8 VACS sites was polled to see if they had a mental health care provider on-site in their general medicine and infectious disease clinics. We defined mental health care provider as any individual specially-trained and designated via job description to screen and/or treat veterans identified by their PCP as having a mental health disorder. These individuals could be social workers, registered nurses, nurse practitioners, physician assistants, psychologists or psychiatrists. These survey items were collected in order to help account for individual clinic and site variation in depression treatment rates. Clinic directors responded with information, including names, titles, contact information and descriptive comments, for mental health professionals at their respective clinics.

Analyses

To test our first hypothesis, the proportion of the sample with PHQ-9 depression was assessed, in total and by clinic type. Bivariate comparisons by clinic were assessed using chi-square and t-tests. The proportion of depressed veterans receiving SSRI was determined. Bivariate correlates of lack of SSRI among depressed patients were assessed by HIV status, veteran demographics and medical comorbidities, site and individual clinic.

Each of the individual survey items in PHQ-9 were separately analyzed by clinic status. They were first assessed by survey item and severity measures. Then, severity measures "0 – Not at all" through "2 – More than ½ the days" were grouped as "Other" and compared to severity measure "3 – Nearly every day" by clinic status to determine distribution of symptom severity.

Site variation was assessed by clinic type and individual clinic and compared to bivariate data from mental health provider survey.

Logistic regression was used to determine whether clinic type was associated with treatment, adjusting for potential confounding variables. In both models, we controlled for the following demographic and clinical factors: age (<50 or ≥50), race (African-American, White, non-Hispanic, Hispanic), medical comorbidities (alcohol and substance abuse/dependence, coronary artery disease, diabetes mellitus, hypertension and pulmonary disorders), clinic type (general medicine or infectious disease), geographic site (each of the 8 VACS sites) and individual clinic (each clinic at each geographic site). Logistic regression models were run using receipt of SSRI alone, and then receipt of SSRI or mental health care service utilization. When adding provider characteristics, we

controlled for clustering of multiple patients within a provider by using generalized estimating equations (GEE). All statistical analyses were done using SAS version 9.

Collaborators

With the exception of the mental health provider survey, data for this project was taken from Dr. Justice's ongoing VACS study. Drs. Amy Justice and Joseph Goulet and Ms. Sueoka collaborated on project design. Dr. Joseph Goulet conducted the statistical analysis. Ms. Sueoka collaborated with Drs. Justice and Goulet on data presentation and discussion. Ms. Sueoka was the primary author of this thesis text.

RESULTS

Subject Characteristics

The analytic sample consisted of 732 male veterans with a PHQ-9 score of 10 or greater. The sample had a median age of 48 years and 59% of the population was over age 50. The sample was predominantly African American (58%), with the rest of the population comprised of 36% white, non-Hispanic and 12% Hispanic (Table 3). A minority of the veterans were married (20%) compared to those never married (29%), divorced (29%), separated (12%), widowed (3%), living with partner (8%). Within this population, 40% had been diagnosed with alcohol abuse or dependence ever during the time period they received care at a Veterans Health Administration.

Table 3. Demographic and Clinical Description of Analytic Sample

Characteristics	% Total n=732	% HIV- n=298	% HIV+ N=434	P
Age[A]				
≥50 years	40.9	39.6	41.7	0.6
Race[A]				
Native American	4.6	3.4	5.5	0.2
Asian	0	0	0	
African-American	58.3	56.4	59.7	
Native Hawaiian or API	0.8	0.7	0.9	
White, non-Hispanic	35.8	37.6	34.6	
White, Hispanic	12.0	10.7	12.9	
Marital Status[A]				
Married	20.0	32.2	11.5	<0.0001
Divorced	28.6	30.5	27.2	
Separated	11.9	14.4	10.1	
Widowed	2.9	1.7	3.7	
Number of Medical Diseases (median) [B,C]	2 (0-17)	2 (0-10)	3 (0-17)	0.1
Number of Comorbid Medical Diseases (mean) [B,C]	2.89	2.39	2.85	0.009
Receipt of SSRI[D]	36.2	34.2	37.6	0.4
Mental Health Visit	28.3	32.6	25.4	0.03
Receipt of SSRI or Mental Health Visit[B,D]	48.1	48.9	47.7	0.8
Mental Health Visits (median)[B]	0 (0-126)	0 (0-126)	0 (0-45)	0.03
Mental Health Visits (mean)[B]	2.3	3.2	1.7	0.005

[A] Veterans Health Survey
[B] VA Administrative Data
[C] For HIV-infected population, HIV diagnosis not included in Number of Comorbid Medical Diseases
[D] VA Pharmacy Benefits Management (PBM)

Our sample was divided by clinic status into 59% HIV-infected veterans (n=434) and 41% uninfected veterans (n=298). There were no significant differences by provider type in veteran age or race. HIV-infected veterans were significantly more likely to have never married (22% vs. 6%, $p<0.01$). In terms of medical comorbidities, uninfected veterans had significantly more cardiovascular and endocrine comorbidities, with no difference in rates of substance abuse/dependence and lung disease (Table 4). The rates of alcohol abuse/dependence (37% uninfected and 42% HIV-infected, $p=0.2$) and

substance abuse/dependence (45% uninfected and 49% HIV-infected, p=0.4) were not statistically different. There was no significant difference in rates of pulmonary diseases (20% vs. 22%, p=0.5). On the other hand, 20% of uninfected veterans were diagnosed with coronary artery disease, compared to 9% of HIV-infected veterans (p<0.01). Likewise, the uninfected population had a higher prevalence of diabetes mellitus and hypertension than the HIV-infected population (29% vs. 17%, p<0.01, and 64% vs. 38%, p<0.01, respectively).

For the HIV-infected population, we estimated the sample's HIV severity by considering several clinical characteristics. The median CD4 count was 338 (SD 285.5). The median viral load within this HIV-infected population was 2836 (SD 127,705.8).

Table 4. Comorbidities by Clinic

Comorbidity[A]	% Total n=732	% HIV- n=298	% HIV+ n=434	P
Alcohol abuse/dependence	40.2	37.3	42.2	0.2
Substance abuse/dependence	47.4	45.3	48.9	0.3
Coronary Artery Disease	13.8	20.1	9.2	<.0001
Diabetes mellitus	21.5	28.5	16.6	0.0001
Hypertension	48.9	64.4	38.3	<0.0001
Pulmonary Disorder	20.9	19.8	21.7	0.5

[A] ICD-9 diagnostic codes for comorbidities included in these categories detailed in Methods section. Includes ICD-9 diagnostic codes assigned to a veteran during the entire time he received care at a VHA, not just during the one-year study period.

Prevalence of Active Depressive Symptoms

All 732 patients screened positive for depression, with 88% sensitivity and specificity for major depressive disorder. Each of the PHQ-9 survey items were analyzed individually and stratified by HIV status to examine the distribution of psychiatric and

neurovegetative symptoms (Table 5) [1]. When considering each survey items by severity measure, there were significant differences between HIV-infected and uninfected veterans in levels of low self-esteem (survey item 6) and psychomotor changes (survey item 8). Fifty-one percent of uninfected veterans reported that they felt low self-esteem nearly every day compared to 31.1% of the HIV-infected veterans ($p<0.0001$). Uninfected veterans were more likely to report psychomotor changes nearly every day (19.8% vs. 11.8, $p=0.02$), whereas HIV-infected veterans were more likely to report only occasional changes (25.1% vs. 19.5%, $p=0.02$). There was no significant difference in frequency of the other 7 survey items by HIV status. This analysis reflects the more severe depression in the uninfected veteran sample that was apparent from the overall screening and diagnostic categories. In particular, uninfected veterans reported frequent cognitive-affective symptoms (low self-esteem) and neurovegetative symptoms (psychomotor change).

[1] In Table 5, each bracketed term referred to a depressive symptom, either cognitive-affective or neurovegetative, categorized in Table 2. Each term directly corresponds to DSM-IV criteria for major depressive disorder (32) & PHQ-9 survey items (Appendix).

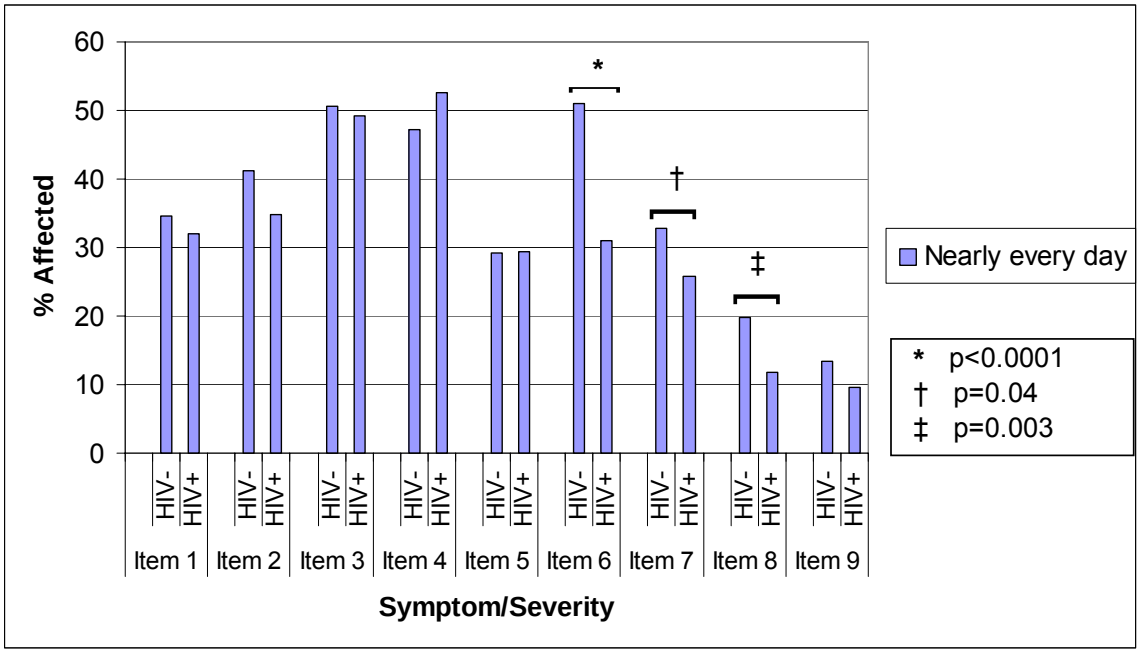
Table 5. PHQ-9 Symptom Severity by Clinic[i].

Symptom/Severity Items	% Total (n=732)	% HIV-(n=298)	%HIV+(n=434)	P
1. [Anhedonia] Little interest or pleasure in doing things [A]				
Not at all	9.4	10.1	9.0	0.8
Several days	27.0	26.2	27.4	
> ½ the days	30.6	29.2	31.6	
Nearly every day	33.1	34.6	32.0	
2. [Depressed Mood] Feeling down, depressed, or hopeless				
Not at all	5.6	4.0	6.7	0.08
Several days	24.6	21.1	27.0	
> ½ the days	32.4	33.6	31.6	
Nearly every day	37.4	41.3	34.8	
3. [Sleep Change] Trouble falling/staying asleep, sleeping too much				
Not at all	7.1	8.4	6.2	0.2
Several days	15.2	16.8	14.1	
> ½ the days	27.9	24.2	30.4	
Nearly every day	49.9	50.7	49.3	
4. [Fatigue] Feeling tired or having little energy				
Not at all	4.0	4.4	3.7	0.8
Several days	15.3	16.1	14.8	
> ½ the days	31.6	32.2	31.1	
Nearly every day	49.2	47.3	50.5	
5. [Appetite Change] Poor appetite or overeating				
Not at all	20.1	24.2	17.3	0.1
Several days	22.1	21.1	22.8	
> ½ the days	28.4	25.5	30.4	
Nearly every day	29.4	29.2	29.5	
6. [Low Self-esteem] Feeling bad about yourself – or that you are a failure or have let yourself or your family down				
Not at all	13.7	10.7	5.7	<.0001
Several days	19.7	14.8	23.0	
> ½ the days	27.5	23.5	30.2	
Nearly every day	39.2	51.0	31.1	
7. [Concentration Difficulty] Trouble concentrating on things, such as reading the newspaper or watching television				
Not at all	22.1	20.8	23.0	0.2
Several days	23.6	20.8	25.6	
> ½ the days	25.6	25.5	25.6	
Nearly every day	28.7	32.9	25.8	
8. [Psychomotor Change] Moving or speaking so slowly that other people could have noticed. Or…being so fidgeting or restless that you have been moving around a lot...				
Not at all	44.1	43.3	44.7	0.02
Several days	22.8	19.5	25.1	
> ½ the days	18.0	17.5	18.4	
Nearly every day	15.0	19.8	11.8	
9.[Suicidality] Thoughts that you would be better off dead or of hurting yourself in some way				
Not at all	49.9	45.3	53.0	0.2
Several days	26.6	28.9	25.1	
> ½ the days	12.3	12.4	12.2	
Nearly every day	11.2	13.4	9.7	

Survey items were analyzed a second time, stratifying answer choices by “nearly every day” or “other” (which included “not at all,” “several days” and “more than half of the days”) (Figure 2). Similar to the non-stratified analysis, this analysis showed prominent low self esteem in the uninfected veteran sample. Uninfected veterans were more likely to feel low self esteem almost every day (51% vs. 31.1%, $p<0.0001$). Uninfected veterans were also more likely to have severe concentration disturbances (32.9% vs. 25.8%, $p=0.04$) and psychomotor changes (19.8% vs. 11.8%, $p=0.003$).

Thus, the analyses reveal that uninfected veterans are more likely to have severe symptoms, especially those of low self esteem, concentration difficulties and psychomotor changes. More than half of the uninfected veterans reported feeling low self esteem nearly every day. Uninfected veterans had a greater proportion, nearing statistical significance, who reported depressed mood (uninfected 41% vs. HIV-infected 35%, $p=0.08$).

Figure 2. PHQ-9 Symptom/Severity[A] by Clinic, Stratified by "Nearly every day" vs. "Other"



[A] Symptom Items 1-9 refer to the survey item numbers, detailed in Table 5.

Item 1 – Anhedonia
Item 2 – Depressed mood
Item 3 – Sleep change
Item 4 – Fatigue
Item 5 – Appetite change
Item 6 – Low self-esteem
Item 7 – Concentration difficulty
Item 8 – Psychomotor change
Item 9 – Suicidality

Treatment

In total, 36.2% of veterans received SSRIs within the one-year time frame (Table 3, 6). There was no significant difference between the total number of veterans receiving SSRIs by clinic status (34.2% of uninfected vs. 37.6% of HIV-infected, p=0.4). Uninfected veterans were significantly more likely to receive mental health services only for depression treatment (32.6% of uninfected vs. 25.4% HIV-infected received any mental health service, p=0.03) (Table 6). However, there was no significant difference by HIV status in receipt of treatment when considering either SSRI or mental health utilization

(48.9% of uninfected vs. 47.7% of HIV-infected veterans, p=0.8). Regarding race, African-American veterans were significantly less likely to have received SSRI (48% vs. 30%, $p<0.01$). Age and marital status also did not affect proportion of veterans receiving SSRIs. Thus, in unadjusted analysis, there are no difference in rate of depression treatment between HIV-infected and uninfected veterans.

Site Variation

Although there were no significant differences in receipt of SSRI by HIV status, veteran demographics or comorbidities, there was significant site and clinic variation (Table 6). The proportion of treated veterans ranged from 20% at Site F to 50% at Site G (p=0.004).

To consider different infrastructures for mental health care, clinic directors were surveyed regarding the presence of a mental health provider on site (Table 6). The sites with the both the lowest and highest treatment rates had mental health providers in their clinics. Patients receiving care in facilities with mental health providers were not more likely to have received SSRI (39.3% vs. 34.2%, p=0.2) (Table 6). However, patients at facilities with mental health providers were significantly more likely to have received SSRI or mental health utilization (57.5% vs. 42.1%, p<0.0001).

Multivariate Models

After controlling for veteran age, race and number of comorbid conditions, HIV-infected veterans did not differ significantly in receipt of SSRI (Table 7). Each site was compared to the site with the largest number of veterans, Site D, in order to make the statistical estimates more stable. The only variables which made a significant difference were site and clinic. Veterans at Site F were less than half as likely to receive depression treatment compared to veterans at Site D (OR=0.45, 95% CI 0.25, 0.84).

Table 7. Multivariate Regression of the Association of Receipt of SSRI with Veteran Demographic and Clinical factors [A]

	OR	95% CI		P
Receipt of SSRI				
Age	0.99	0.97	1.02	0.6
African-American	0.69	0.32	1.48	0.3
White, non-Hispanic	1.86	0.88	3.92	0.1
Hispanic	0.65	0.35	1.21	0.2
Alcohol abuse/dependence	1.08	0.71	1.63	0.7
Substance abuse/dependence	1.48	0.97	2.26	0.07
Coronary Artery Disease	0.95	0.58	1.55	0.8
Diabetes mellitus	1.45	0.97	2.18	0.07
Hypertension	1.21	0.84	1.75	0.3
Pulmonary disorder	1.05	0.71	1.57	0.8
Site A – ID Clinic	1.26	0.61	2.61	0.5
Site B – ID Clinic	0.89	0.36	2.20	0.8
Site C – ID Clinic	1.41	0.70	2.85	0.3
Site D – ID Clinic	0.96	0.44	2.10	0.9
Site E – ID Clinic	0.58	0.24	1.40	0.2
Site F – ID Clinic	1.37	0.61	3.09	0.5
Site G – ID Clinic	2.05	0.94	4.46	0.07
Site H – ID Clinic	1.54	0.38	6.23	0.5
Site A – GM Clinic	0.71	0.29	1.74	0.5
Site B – GM Clinic	0.84	0.29	2.44	0.8
Site D – GM Clinic	0.55	0.20	1.48	0.2
Site E – GM Clinic	0.52	0.20	1.31	0.2
Site F – GM Clinic	1.83	0.74	4.54	0.2
Site G – GM Clinic	1.19	0.55	2.58	0.7
Site H – GM Clinic	1.20	0.33	4.36	0.8

[A] All sites compared to Site C – GM clinic (clinic with largest number of patients).

In Table 8, when adjusting the model to account for either receipt of SSRI or mental health visit, more significant differences in treatment rates by race, site and clinic became apparent. When including mental health visits, white non-Hispanic veterans were more than two times as likely to receive treatment (OR=2.09, 95% CI 1.04, 4.24).

Table 8. Multivariate Regression of the Association of Receipt of SSRI or Mental Health Services Utilization with Veteran Demographic and Clinical Factors [A]

	OR	95% CI		P
Receipt of SSRI or Mental Health Utilization				
Age	0.99	0.97	1.01	0.5
African-American	0.84	0.41	1.72	0.6
White, non-Hispanic	2.17	1.06	4.42	0.03
Hispanic	0.71	0.40	1.29	0.3
Alcohol abuse/dependence	1.42	0.95	2.13	0.09
Substance abuse/dependence	1.17	0.78	1.77	0.5
Coronary Artery Disease	0.92	0.57	1.49	0.7
Diabetes mellitus	1.35	0.90	2.02	0.1
Hypertension	1.21	0.85	1.73	0.3
Pulmonary disorder	1.08	0.73	1.59	0.7
Site A – ID Clinic	0.89	0.44	1.81	0.8
Site B – ID Clinic	0.62	0.26	1.47	0.3
Site C – ID Clinic	1.08	0.54	2.15	0.8
Site D – ID Clinic	1.22	0.57	2.60	0.6
Site E – ID Clinic	0.43	0.19	0.97	0.04
Site F – ID Clinic	1.16	0.53	2.56	0.7
Site G – ID Clinic	2.16	0.99	4.72	0.05
Site H – ID Clinic	1.21	0.29	5.00	0.8
Site A – GM Clinic	0.50	0.21	1.17	0.1
Site B – GM Clinic	1.01	0.38	2.71	1.0
Site D – GM Clinic	0.77	0.31	1.94	0.6
Site E – GM Clinic	0.48	0.20	1.13	0.09
Site F – GM Clinic	1.46	0.59	3.58	0.4
Site G – GM Clinic	1.74	0.81	3.74	0.2
Site H – GM Clinic	1.38	0.36	5.33	0.6

[A] All sites compared to Site C – GM clinic (clinic with largest number of patients).

Veterans at Site H were more likely to receive depression treatment (OR=1.86, 95% CI 1.10, 3.16) (Table 8). Veterans at Site F were still less likely to receive treatment, either SSRI or mental health (OR=0.43, 95% CI 0.23, 0.77). At Site H,

veterans were nearly twice as likely to receive depression treatment as veterans at Site D (OR=1.86, 95% CI 1.10, 3.16). Veterans at the ID clinic at Site E were less than half as likely to receive treatment as their comparators at GM clinic at Site C (OR=0.43, 95% CI 0.19, 0.97).

DISCUSSION

By evaluating the relationship between depression treatment rates and HIV status, we have reached four main conclusions: depression symptomatology significantly overlaps with chronic disease symptoms; provider comfort levels do not influence provider practice regarding depression treatment; race exerts a significant influence over treatment rates; and depression treatment rates varied most significantly by individual site.

Our sample was well-matched in that none of the demographic factors were significantly different between the depressed HIV-infected and uninfected veterans. In terms of comorbidities, HIV-infected veterans had a significantly higher mean number of comorbid medical illnesses, not including HIV. Uninfected veterans had a higher proportion of coronary artery disease, hypertension and diabetes mellitus compared to the HIV-infected population. It is likely these prevalent chronic medical illnesses which brought the relatively young, uninfected veteran population to regular care at the VA primary care clinics.

Consistent with our primary hypothesis, both of these populations had high rates of active depression symptoms compared to the general population. The point prevalence of primary care patients with depression in the general population is 10-14% (8). In the initial VACS sample, 19% of uninfected veterans and 21% of HIV-infected veterans screened positive for major depressive disorder, which was not significantly different by HIV status. However, analysis by survey item (which correlated with specific DSM-IV criteria) by HIV status revealed that depressed uninfected veterans scored higher in depression symptom severity. Uninfected veterans had a significantly larger proportion report daily symptoms for 3 out of 9 depression survey items. Uninfected veterans

reported higher rates of both cognitive-affective and neurovegetative symptoms: low self-esteem (survey item 6), concentration (survey item 7) and psychomotor changes (survey item 8). The only depressive symptom displayed more often by HIV-infected veterans was a neurovegetative symptom – appetite change – which is a common side effect of antiretroviral drugs. In particular, the number of uninfected veterans who experienced daily low self-esteem was alarmingly high. We expected higher rates of low self-esteem in the HIV-infected cohort secondary to HIV stigma (50;51).

In opposition to our primary hypothesis, our results demonstrated no difference in depression treatment rates between veterans by HIV status. Although a previous study reported substantial differences in general medicine versus infectious disease provider comfort with depression treatment, both uninfected and HIV-infected veterans were equally unlikely to be treated for depressive symptoms. This overall low rate of treatment, ranging from 34-49%, suggests that comfort with treatment does not insure treatment among those with active depressive symptoms. Depressed uninfected veterans had an equally low chance of being treated by their general PCP compared to depressed HIV-infected veterans receiving care from an HIV PCP.

The presence of specific medical comorbidities did not have any effect on treatment status in this population. With low overall treatment rates in this sample, we presumed that chronically-ill veterans would be least likely to be treated. Chronic medical illnesses that affect global functioning and quality-of-life, such as cardiovascular disease, pulmonary disease and diabetes, are associated with a higher degree of frailty (6). Veterans with these illnesses should have higher risks associated with depression treatment due to polypharmacy and compromised organ function (6). Yet, there was no correlation between significant medical comorbidities and absence of depression

treatment in our sample. Perhaps the number, and not the nature of comorbidities affects the receipt of depression treatment. Indeed, higher numbers of comorbid medical illness have been associated with similar depression treatment rates but poorer depression outcomes (52;53).

Our analysis of demographic and clinical factors revealed differences in treatment patterns by race. While African-American veterans were equally as likely to be depressed in our sample, they were less likely to receive an SSRI. There was no significant difference between races regarding SSRI treatment alone. However, white, non-Hispanic patients were more likely to receive depression treatment when including mental health services in our treatment definition.

In this sample, there is no clear reason why African-American veterans were significantly less likely to receive an SSRI than other racial/ethnic groups. Both groups had access to health care as evidenced by their participation in the study. They had the same reduced medication costs at the VA pharmacy. Beyond cost, some recent studies suggest that ethnic minorities, such as African-Americans and Hispanics, are less likely to accept antidepressants as first-line treatment for depression from PCPs (54;55).

It appears that it is not only "who you are," but "where you are" that determines your likelihood of receiving depression treatment. Our study demonstrated a high degree of individual clinic variation. Patients were half as likely to receive depression treatment at one site, Site E – ID Clinic, than patients at the largest individual clinic, Site C – GM clinic. They were twice as likely to receive depression treatment at Site G – ID Clinic, as patients at the largest individual clinic. Again, clinic type (ID vs. GM) did not correlate with depression treatment rates. Both the highest and lowest rates of treatment were both in ID clinics.

Patients receiving care in a clinic with mental health provider on site were significantly more likely to receive treatment when considering antidepressants or mental health care utilization (Table 6). It is important to note that, as the VA is a closed system, these clinic sites are the locations where these veterans receive the majority of their health care. Considering most VA general medicine and infectious disease clinics have similar designs, these sites have a large degree of uniformity. We compared clinics of various sizes, ranging from 22 to 146 patients, but the VA clinics were all located in urban centers and served populations with similar demographics. Site uniformity is valuable because it narrows our search for variables that could explain differences in depression treatment rates. However, even at VA clinics, there are site differences in race/ethnicity composition, regional and institutional culture, and clinic infrastructure and provider characteristics that can affect health care quality.

Study Limitations

Potential limitations of this study include its cross-sectional design, basis on screening and narrow treatment definition. First, this study was designed as a cross-sectional quantitative data analysis. Our study would certainly benefit from the ability to follow up with these veterans to evaluate duration of symptoms and receipt of medication over time.

Our depressed veterans did not carry a formal diagnosis of depression. Instead, we used a screening tool, the PHQ-9, which was based on DSM-IV criteria. The PHQ-9 has demonstrated good correlation with MDD diagnosis in several clinical trials (43-46;46-49). However, the potential overlap of neurovegetative symptoms and chronic disease symptoms complicates depression screening. It would have been valuable to be

able to formally diagnose patients with MDD as part of our study. It is possible that the PHQ-9 gives us a large number of false positives, which in turn would show inaccurately high rates of depression and low rates of treatment. Moreover, we did not have the resources to rule out mania symptoms in patients with active depressive symptoms to verify that antidepressant therapy, and not a mood stabilizer, was the appropriate first-line treatment (19).

However, it is a strength of our study that we did not depend on usual care depression diagnosis to determine our sample. By using results from a uniformly-applied screening tool conducted at time of study enrollment, we were able to include all patients who had active depressive symptoms. We included veterans who were depressed but not yet diagnosed by their provider.

By narrowing our definition of depression treatment, we could have potentially biased our results to show inaccurately low treatment rates. Our analysis did not include any veterans who received treatment, either prescription medication or counseling, outside the VA health care system. We excluded veterans on classes of antidepressants other than SSRIs, but these exclusion criteria should not have biased this particular sample. No veterans were excluded exclusively for MAOI use, and only a small number of veterans were excluded for TCA use.

By excluding patients with PHQ-9 score lower than 10, we did not explore the potential subgroup of patients within the VACS sample who have been diagnosed with depression and adequately treated. These patients would have PHQ-9 scores lower than 10 as a result of successful treatment; thus, they would not be included in our analysis. In this sense, our reported treatment rates may be lower than the true rates of depression treatment within the VACS sample. This exclusion should not affect our estimation of

depression prevalence. It also should not affect our comparison of depression treatment rates by HIV status.

Our study considers only prevalence of depression treatment and not treatment effectiveness. Many clinical trials have demonstrated that depression treatment is often ineffective. It would have been clinically valuable to use serial PHQ-9 scores in this sample to track veterans' depressive symptoms over time to assess remission rates. Moreover, it would be valuable to know the degree to which patient refusal contributed to low treatment rates. This information would help us to apply our results to improve clinical practice.

Agreement with Published Literature

In populations with specific comorbid illnesss, similarly high rates of depression have been documented. Current depression prevalence rates are 10-14% for patients receiving medical care in a primary care setting (8). Depression prevalence rates are often higher in patients with specific medical illnesss: congestive heart failure (10-25%), diabetes (11-15%), stroke (15-25%) and cancer (6-39%) (8). HIV-infected patients have likewise been shown to have higher rates of depression compared to uninfected samples (28). In veteran populations, Liu et al found that as many as 45% of their sample had severe depressive symptomatology (10). They studied a similar veteran population at multiple geographic centers, but in an older sample, with a median age of 61 years. Kilbourne et al reported even higher rates of depression in a group of HIV-infected veterans with comorbid depression (31). Their sample had a higher proportion of veterans with depressive symptoms compared to general population estimates, with 46% reporting active depressive symptoms and 23% reporting severe depressive symptoms (31). Like

the veterans in our sample, these subjects had high rates of depression in the setting of chronic medical illness.

Several other studies have reported comparably low depression treatment rates. Of the veterans with depressive symptoms in the study by Liu et al, 25% were appropriately diagnosed and started on antidepressant therapy (10). Thus, this study reported high rates of depression and low rates of treatment comparable to the results of our analysis. Koike et al reported no difference in treatment rates of patients with and without significant medical comorbidities. Moreover, they followed their subjects longitudinally and reported worse depression outcomes in the patient group with comorbid medical illness (52;53).

Our results agree with a large body of published studies which report racial/ethnic differences in depression treatment rates. These studies have documented lower treatment rates, both for antidepressant therapy and counseling, for African-Americans compared to White, non-Hispanic patients (56-59). These differences may be explained by racial differences in health care access or patient preference. Health care access is less relevant to our patient population, as described earlier. In our sample, patient preference may help to explain lower depression treatment rates. The HIV Cost and Services Utilization Study (HCSUS) found that whites were much more likely than African-Americans to accept medication as treatment for psychological problems such as depression (60). In fact, African-Americans mounted greater resistance to formal depression treatment in any form (55). Patients in these studies have listed a number of reasons, including fear of addictive qualities of medications and greater belief in non-medical treatments such as prayer for their hesitation to start depression therapy.

There is less evidence specifically identifying site variation and its effect on depression treatment rates. However, a recent study by Virnig et al implicated both race and geography in quality of medical care (61). Another study explored the role of individual clinic racial demographics on depression treatment rates for Latinos (62). Katon et al examined an even smaller microenvironment, looking at individual providers and differences in their depression treatment patterns (63). This study did not find any significant difference in depression treatment patterns across 63 family practice physicians in 4 different primary care clinics (63). These studies attempt to characterize the significant role of clinic environment on depression treatment.

Our findings reinforce our current understanding that depression is poorly recognized and treated regardless of provider specialty and comfort level. HIV status and patient comorbidities did not affect treatment rates in this sample. However, race and site variation were significantly associated with receipt of treatment. Our results emphasize the subtle complexities of depression in patients with comorbid medical illness.

Current Depression Diagnostic Criteria Are Unclear In Specific Populations

Predominant neurovegetative symptoms in our depressed, chronically-ill sample question if our screening tools distinguish between depression and chronic medical illness. Although the PHQ-9 has been validated as a sensitive and specific screening tool, it may overdiagnose depression in populations with chronic medical illness (43-46;46-49). The PHQ-9 is based closely on DSM-IV criteria, which includes five neurovegetative items: sleep change, fatigue, appetite change, concentration difficulty and psychomotor change (44;46). However, for patients and clinicians alike, it is often difficult to distinguish

which symptoms stem from which disease process. Patients may feel "slow" from poor lung function secondary to their COPD or "restless" from one of their medications. In HIV-infected patients, concentration difficulties could stem from HIV-associated dementia or HIV1-associated minor cognitive motor disorder (6). Clinical distinction between depressive symptoms and somatic symptoms become even less clear in advanced stages of medical disease, like HIV or cardiovascular disease (6;8;31).

Even the formal diagnostic criteria for depression do not give clear guidance on how to distinguish between somatic and psychiatric symptoms. The DSM-IV specifies that to achieve a formal MDD diagnosis, an individual must report active depressive symptoms that are "not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism)" (32).

These diagnostic complexities are especially salient in our chronically-ill sample. When we considered each of the survey items individually, we found that only about one-third of both HIV-infected and uninfected veterans reported core depressive symptoms: anhedonia and depressed mood. This is a low proportion considering that all of these patients screened positive for major depressive disorder. Moreover, approximately half of both patient groups reported frequent neurovegetative symptoms. Uninfected veterans surprisingly had a higher proportion of persistent cognitive-affective and neurodegenerative symptoms. On the contrary, HIV-infected patients reported a higher rate of neurovegetative symptoms and only occasional cognitive-affective symptoms.

In a review of HIV and depression in primary care, Colibazzi et al discuss the challenge of diagnosing depression in HIV-infected patients (6). They recommend that clinicians choose either an inclusive or exclusive diagnostic model for depression. The DSM-IV diagnostic model is inclusive, as it recommends scoring any neurovegetative

symptom as a depression symptom in the absence of another clear etiology (6). Colibazzi et al discuss exclusive models, which substitute additional cognitive-affective symptoms for neurovegetative symptoms when diagnosing depression in chronically ill patients (6). The authors advocate choosing either model based on what the clinician thinks will lead to the best outcome for each patient.

Thus, these guidelines are unable to give clear guidance. They underscore the difficulty in developing global depression guidelines, and concede that a clinician might either overdiagnose or underdiagnose depression based on clinical judgment. In their estimation, depression diagnosis and treatment relies more on the art of medicine in the absence of clear evidence. Within the context of these guidelines, the HIV-infected veterans in our sample fall in the diagnostic "gray" zone. It seems likely that if we took an exclusive approach to diagnosis, substituting cognitive-affective symptoms for neurovegetative ones, we would detect lower rates of screen-positive depression in our HIV-infected sample.

Clinical studies have attempted to distinguish which symptoms come from which disease process in HIV-infected patients. Kilbourne et al found that, in HIV-infected veterans with comorbid depression, neurovegetative symptoms were independently associated with the severity of their HIV-related illness, but not their depression severity (31). This study concluded that neurovegetative symptoms may be attributed too often to depression. Even commonly used HIV medications, such as antiretrovirals and prophylactic antibiotics, can cause neurovegetative symptoms like fatigue and appetite loss that can be mistaken for depression symptoms (6). These researchers express concern that clinicians may misdiagnose depression in certain patients and actually fail to recognize worsening medical illness or treatment complications.

What Might Explain the Significant Site Variation?

In seeking variables that affected receipt of depression treatment, we found significant differences at the level of the individual clinic. Considering our samples were demographically well-matched, it is likely that these significant differences are related to clinic or provider variables. Our "Mental Health Provider in Clinic" survey sought definitive differences in clinic infrastructure which could explain site variation of depression treatment rates. We explored geographic proximity to mental health care services to see if it affected how many veterans received depression treatment. Some clinics had mental health professionals located in GM and ID clinics to help PCPs diagnose and treat depression. We detected a positive association between mental health professional in clinic and rates of depression treatment when we defined treatment as SSRI or mental health utilization. Thus, it appears that lack of treatment may relate to proximity to mental health resources. From our analysis, mental health providers on site in clinic have a positive effect on rates of depression treatment.

The presence of opinion leaders at various sites could also account for clinic and site variation in depression treatment. Clinical trials have demonstrated that opinion leaders, well-respected providers who informally influence colleagues' clinical choices, can create significant differences in individual clinical practices (64-66). For instance, if a well-respected physician at one VA site closely follows depression clinical research and quickly implements guidelines, then his colleagues are likely to adopt the same new guidelines. The opposite behavior is also true; opinion leaders are often conservative and slow to adopt new guidelines or clinical practices (66). Colleagues of these opinion leaders likely are slow to adopt clinical changes. Further research may help to identify if

opinion leaders are the variable that determines who receives depression treatment. This knowledge could help us to create specific interventions to influence opinion leaders to recognize and treat depression.

Researchers have adopted creative approaches to depression treatment in order to control for variables such as mental health provider access and opinion leaders. They have placed their faith and funding into a variety of population-based models, to increase depression treatment rates in an affordable way, with modest results (3;4;14;15;67-71). Most of the current studies compare two different treatment models: referral and collaborative care models (3;4;14;15;67-71). Referral care involves enhancing avenues for PCPs to refer patients to mental health specialists. Mental health care occurs in a geographic site outside the primary care clinic. In collaborative care models, adjunct staff – care managers and trained nurses – provides mental health care on-site at the primary care clinic. Often, off-site psychiatrists oversee the mental health care decisions via weekly meetings.

A recent study, IMPACT, has shown improved patient outcomes treating depression in elderly populations with multiple comorbid medical illnesses (53). These results show promise because they demonstrate that patients with and without comorbid medical disease see comparable improvement in depressive symptoms. Still, in the IMPACT study, the patients with comorbid illnesses had more severe depressive symptoms at baseline and after intervention than patients with depression but without medical comorbidity (53). Even though they mounted a significant response to treatment, patients with comorbid illnesses had significant residual depressive symptoms.

What Other Factors Affect Depression Treatment Rates in Chronically Ill Patients?

Our study revealed associations between depression treatment and race and individual clinic, yet there are a myriad of other patient and provider considerations that weigh in on each treatment decision. Depression treatment must start with a process of acceptance on the part of the patient. Providers have reported significant patient resistance to starting depression treatment (72). In order to accept treatment, the patient must first accept that there is a problem and that it is significant enough to require medical intervention. If patients present with purely somatic symptoms, they often have trouble accepting that these symptoms are evidence of a mood disorder (73). Many patients describe depression as a byproduct of weak willpower; likewise, they interpret depression treatment as evidence of character weakness (74).

Even if they agree that they have a medical problem requiring medical treatment, many patients resist treatment because they feel stigmatized by being labeled with a psychiatric diagnosis (74;75). Patients have reported lowered self-esteem when providers have attributed their distress to mental health illness, compared to "bodily illness" (74). As a result, mental illness stigma has a profound effect on patients' willingness to accept depression diagnosis and treatment.

Furthermore, patients may have practical barriers to completing depression treatment. In order to complete acute depression treatment, most patients require at least 6 to 8 weeks of antidepressant therapy or 4 to 20 weeks of psychotherapy (5). Patients may have trouble with logistics, such as time, transportation or cost of these therapies. Patients have reported that factors such as unpaid time off work and insurance coverage influence their depression treatment decisions (74;76).

Providers may identify competing medical needs as a barrier to initiating depression treatment. For many providers and patients, stabilization of medical illness is first priority during their outpatient visits (72). Patients have "competing demands" that need to be addressed by their PCP (77;78). A patient who has just been released from the hospital after a myocardial infarction or is starting insulin to optimize glycemic control may not wish to talk about initiating depression therapy in the same visit. In this sense, it is important to consider whether unstable chronic medical illness competes with depression for medical attention.

By discussing competing demands, we do not mean to justify lack of treatment. We simply discuss one potential explanation for the large proportion of patients who are depressed and untreated. Many studies conclude that medical illnesses should be easier to treat if a provider first treats the patient's depression (8;53). Treating depression has been shown to improve patients' medical outcomes with comorbidities such as congestive heart failure, diabetes and chronic obstructive pulmonary disease (8). Many of these studies, however, focus on patients with one comorbid medical disease. These results may not prove reproducible in a population such as our sample, which has 2.89 median comorbid diseases.

Much of the current literature concludes that patients go untreated because they do not have access to treatment, either at the provider or system level (72). Indeed, one study describes the common belief that "poor performance by primary care physicians in detection and treatment of depression is the weak link in any national effort" (72). Yet, our study highlights just a few of the innumerable factors that influence depression treatment rates, including: inaccurate depression prevalence measures, clinic

infrastructure, opinion leaders, patient acceptance of treatment and competing demands. Low depression rates probably result from a combination of all of these variables.

In examining depression treatment rates, we have concluded that depression diagnostic criteria and screening tools have questionable validity in populations with comorbid medical illness. We suspect that the high rates of depression reported in both HIV-infected and uninfected veterans are inaccurately high. Perhaps a large number of patients who screen positive for depression do not truly have major depressive disorder and may not benefit from treatment. Further outcome studies in patients with depression and chronic medical illnesses could help clinicians determine if they should choose inclusive or exclusive diagnostic models. Clinicians could also benefit from studies which evaluate if a higher score threshold or substitution of cognitive-affective criteria in this population leads to more sensitive and specific screening tools.

In spite of these considerations, it is likely that depression is underdiagnosed and undertreated. Our study focuses on a subpopulation, patients with multiple chronic medical illnesses, which may require more tailored interventions for depression. Our current screening tools and treatment models may require modification for use in this population. We have searched for variables that determine receipt of depression treatment in patients with comorbid medical disease. For depression in our sample, it is clearly not a matter generalist or specialist quality of care or HIV status. It is conceivable that opinion leaders, patient treatment preferences and patient competing demands all influence depression treatment rates. In this case, collaborative care models and patient education programs may help to overcome these barriers to depression treatment. It would be valuable to investigate both more rigorous depression interventions and combined interventions targeting both depression and comorbid medical illness. It is

certainly worthwhile to focus future research on this subpopulation because 95% of Medicare dollars are spent on patients with 2 or more chronic medical illness (35).

Considering all of the various factors affecting depression treatment rates, it is likely that we will require a multifaceted approach to depression treatment in order to improve patient outcomes. As the Veterans Health Administration serves the nation's largest population of HIV-infected veterans and a large proportion of the nation's chronically-ill patients, it will undoubtedly benefit from such improvements in depression diagnosis and treatment.

APPENDIX A

VACS Patient Questionnaire – ID Clinic Version*

- PHQ-9 Depression Survey (pg 26 of 31, items 111-112)

* The VACS Patient Questionnaire – GM Clinic Version is identical to this survey, except that it excludes HIV-related questions.

APPENDIX B

Mental Health Provider in Clinic Survey

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To Whom It May Concern:

We would appreciate if you could answer this brief survey. We are investigating rates of depression treatment of veterans at various VA sites participating in the Veterans Aging Cohort Study (VACS). As part of this study, we would like to know if there is a collaborative model of care between medicine clinics and mental health clinics at your particular clinic.

1. Do you have a mental health professional (MD, PA, APRN, RN) who has an office or sees patients *in your clinic*?
    a. Please circle one: Yes or No
2. If you answered "yes" to question 1, will you please include the contact information (telephone number, email address and/or mailing address) for that mental health professional?

    _____
    _____
    _____
    _____
    _____
    _____

Please return this survey as soon as possible to Faith Whitsett, at faith.whitsett@va.gov. Thank you very much for your time.

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Table 6. Difference in Treatment Rates by Site and by Presence of Mental Health Provider at Site.

Site	Treatment Received – SSRI				Treatment Received – SSRI or Mental Health Service				Mental Health Provider on Site		
	Total	General Medicine	Infectious Disease		Total	General Medicine	Infectious Disease		Yes	No	
A (n=117)	35.9	30.0	39.0		41.9	35.0	45.5			GM, ID	
B (n=80)	42.5	46.9	39.6		52.5	56.3	50			GM, ID	
C (n=66)	28.8	28.0	29.3		37.9	44.0	34.2			GM, ID	
D (n=146)	41.8	38.3	44.2		52.1	51.7	52.3		ID	GM	
E (n=88)	38.2	27.6	33.9		52.3	48.3	54.2		GM, ID		
F (n=98)	20.4	21.4	19.6		27.6	31.0	25.0			GM, ID	
G (n=22)	50.0	50.0	50.0		63.6	66.7	60		GM, ID		
H (n=115)	43.5	37.9	49.1		63.5	62.1	64.9		GM, ID		
Total Treated											
SSRI alone	36.2	34.2	37.6	*P=0.4*					39.3	34.2	*P=0.2*
SSRI or Mental Health Service					48.1	48.9	47.7	*P=0.8*	57.5	42.1	*P<0.0001*

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VACS PATIENT QUESTIONNAIRE
ID Clinic

Thank you for agreeing to participate in our study. The following survey should take about 40 minutes to complete. Please answer all of the questions to the best of your ability. If you have any questions, please ask the Study Coordinator who gave you this survey. When finished, return the survey to the Research Coordinator.

Study ID: | | | | | | |

Last Name: | | | | | | | | | | | | | | | | | |

First Name: | | | | | | | | | | | | | | | | | |

SSN: | | | | | | | | | |

DOB: | | | / | | | / | | | | |

Month: Day: Year:

VACS PATIENT QUESTIONNAIRE - ID CLINIC

FOR ADMINISTRATIVE USE ONLY. TO BE COMPLETED BY STUDY COORDINATOR.

Date of Visit: ☐☐ / ☐☐ / ☐☐☐☐ Study ID: ☐☐☐☐☐☐

1. What is the name of your primary care provider in this clinic?

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

PRE-EXISTING CONDITIONS

2. Has your doctor ever told you that you have any of the following?	YES	NO
a. Anemia or "low blood"	0	0
b. Angina or Coronary Heart Disease	0	0
c. Heart Attack or Myocardial Infarction	0	0
d. Congestive Heart Failure, also called weak heart or fluid on the lungs	0	0
e. Dementia or "Alzheimer's"	0	0
f. Diabetes or high blood sugar or "sugar"	0	0
g. Liver Disease or a bad liver or Cirrhosis	0	0
h. Hepatitis C	0	0
i. Chronic Hepatitis B	0	0
j. High cholesterol, lipids, or triglycerides	0	0
k. Hypertension or high blood pressure	0	0
l. Pancreatitis	0	0
m. Bad nerves in your feet causing pain and numbness (neuropathy)	0	0
n. Bad circulation in your legs or feet	0	0
o. Chronic lung disease (emphysema, asthma, chronic bronchitis or chronic obstructive lung disease)	0	0
p. Kidney Failure (or bad kidneys)	0	0
q. Stroke or "mini" stroke (Transient Ischemic Attack)	0	0
r. Pneumonia	0	0
s. Shingles	0	0
t. TB or Tuberculosis	0	0
u. Depression	0	0
v. Post-Traumatic Stress Disorder	0	0
w. Schizophrenia (hearing voices or seeing things that others don't)	0	0
x. Any kind of Cancer (please list below)	0	0

☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐☐☐☐☐☐☐☐☐

3. Has your doctor ever told you that you have any of the following?

	YES	NO
a. Pneumocystis Pneumonia or PCP	O	O
b. Kaposi's Sarcoma or KS	O	O
c. Lymphoma (non Hodgkins)	O	O
d. Atypical Mycobacterium or MAI or MAC	O	O
e. Cryptosporidiosis	O	O
f. Coccidioidomycosis	O	O
g. Histoplasmosis	O	O
h. Isosporiasis	O	O
i. Toxoplasmosis (in your head or brain)	O	O
j. Salmonella in your blood	O	O
k. CMV in your eye (retinitis) or in your blood (sepsis)	O	O
l. Severe weight loss due to your HIV infection	O	O
m. Problems thinking due to your HIV infection	O	O
n. Candida or fungus in your mouth or throat	O	O

HEALTH HABITS

4. How much do you weigh? (in pounds) (Fill in one circle)

O 90 lbs. or less	O 131 - 140 lbs.	O 181 - 190 lbs.	O 231 - 240 lbs.	O 281 - 290 lbs.
O 91 - 100 lbs.	O 141 - 150 lbs.	O 191 - 200 lbs.	O 241 - 250 lbs.	O 291 - 300 lbs.
O 101 - 110 lbs.	O 151 - 160 lbs.	O 201 - 210 lbs.	O 251 - 260 lbs.	O 301 - 310 lbs.
O 111 - 120 lbs.	O 161 - 170 lbs.	O 211 - 220 lbs.	O 261 - 270 lbs.	O 311 - 320 lbs
O 121 - 130 lbs.	O 171 - 180 lbs.	O 221 - 230 lbs	O 271 - 280 lbs.	O 321 lbs. or more

5. How tall are you without shoes on? (fill in feet (ft.) and inches (in.)) (If 1/2" please round up)

O 5 ft 00 in or less	O 5 ft 04 in	O 5 ft 08 in	O 6 ft 00 in
O 5 ft 01 in	O 5 ft 05 in	O 5 ft 09 in	O 6 ft 01 in
O 5 ft 02 in	O 5 ft 06 in	O 5 ft 10 in	O 6 ft 02 in
O 5 ft 03 in	O 5 ft 07 in	O 5 ft 11 in	O 6 ft 03 in or more

6. How often do you engage in regular activities (e.g. brisk walking, jogging, bicycling, etc.) long enough to work up a sweat?

- 0 NEVER
- 0 LESS THAN ONCE A WEEK
- 0 1 - 2 TIMES A WEEK
- 0 3 - 4 TIMES A WEEK
- 0 5 OR MORE TIMES A WEEK

7. Have you used any of the following therapies in the past year?

	YES	NO
a. Acupuncture/Acupressure	0	0
b. Chiropractic	0	0
c. Herbs/Herbal Medicine	0	0
d. Homeopathy	0	0
e. Imagery	0	0
f. Massage	0	0
g. Meditation/Prayer/Spiritual Healing	0	0
h. Relaxation/Breathing Exercises	0	0
i. Self-help/Support Groups	0	0
j. Special Diet	0	0
k. St. John's Wort	0	0
l. Vitamins/Minerals	0	0
m. Other		

8. In the past 4 weeks have you been concerned about having enough food for you or your family?

- 0 YES
- 0 NO

9. In the past 4 weeks, have you been without a permanent address that you call home?

0 YES

0 NO

10. Have you ever been without a permanent address that you call home?

0 YES

0 NO

11. In the past 4 weeks, have you stayed one or more nights in a shelter, on the street, in a park, or an abandoned building?

0 YES

0 NO

12. Have you ever stayed one or more nights in a shelter, on the street, in a park or an abandoned building?

0 YES

0 NO

13. Do you now smoke cigars or pipes?

0 YES

0 NO

14. Do you now smoke cigarettes (i.e. within the last week)?

0 YES

0 NO

15. Have you ever smoked cigarettes for as long as a year?

0 YES (if YES answer a, b, & c below)

0 NO (if NO, skip to #16 on the next page)

a. How many years have you smoked/did you smoke cigarettes? ☐☐ years

b. How many cigarettes do/did you smoke a day? ☐☐☐ cigarettes

c. If you no longer smoke cigarettes, when did you quit?

0 LESS THAN 4 WEEKS AGO

0 MORE THAN 4 WEEKS AGO

16. Do you think HIV causes AIDS?

0	0	0	0	0
NO, HIV DOES NOT CAUSE AIDS		UNSURE		I AM SURE HIV DOES CAUSE AIDS

17. When did you get your first HIV test that was positive?

☐☐ / ☐☐☐☐
Month / Year

0 NEVER HAD A POSITIVE TEST

18. After you got your first positive HIV test result, how many months was it until you got medical care for HIV? Meaning more testing or an exam?

☐☐ Months

19. Have you ever had a drink containing alcohol?

0 YES (If YES, please continue)

0 NO, NEVER (If NO, skip to #53 on page 12)

20. When was the last time you had a drink?

0 IN THE LAST 30 DAYS

0 IN THE LAST 12 MONTHS

0 MORE THAN 12 MONTHS AGO

21. When you are drinking, how often do you have a drink containing alcohol?

0 NEVER

0 MONTHLY OR LESS

0 2 TO 4 TIMES A MONTH

0 2 TO 3 TIMES A WEEK

0 4 OR MORE TIMES A WEEK

22. How many drinks containing alcohol do you have on a typical day when you are drinking?

0 1 TO 2
0 3 OR 4
0 5 OR 6
0 7 TO 9
0 10 OR MORE

23. When you are drinking, how often do you have 6 or more drinks on one occasion?

0 NEVER
0 LESS THAN MONTHLY
0 MONTHLY
0 WEEKLY
0 DAILY OR ALMOST DAILY

24. Has a relative or friend or doctor or other health care worker been concerned about your drinking or suggested you cut down?

0 NO
0 YES, BUT NOT IN THE LAST YEAR
0 YES, DURING THE LAST YEAR

25. When you found out you were HIV+, did you change the amount you drank?

0 CUT DOWN
0 INCREASED
0 SAME AMOUNT
0 STARTED DRINKING

26. Here are a number of events that drinkers sometimes experience.
Read each one carefully and complete the circle that indicates if this ever happened to you and how often it has happened to you during the past 3 months.

	HAS THIS EVER HAPPENED TO YOU?		DURING THE PAST 3 MONTHS, ABOUT HOW OFTEN HAS THIS HAPPENED TO YOU?			
	YES	NO	NEVER	ONCE OR A FEW TIMES	ONCE OR TWICE A WEEK	DAILY OR ALMOST DAILY
a. I have been unhappy because of my drinking.	O	O	O	O	O	O
b. Because of my drinking, I have not eaten properly.	O	O	O	O	O	O
c. I have failed to do what is expected of me because of my drinking.	O	O	O	O	O	O
d. I have felt guilty or ashamed because of my drinking.	O	O	O	O	O	O
e. I have taken foolish risks when I have been drinking.	O	O	O	O	O	O
f. When drinking, I have done impulsive things that I regret later.	O	O	O	O	O	O
g. My physical health has been harmed by my drinking.	O	O	O	O	O	O
h. I have had money problems because of my drinking.	O	O	O	O	O	O
i. My physical appearance has been harmed by my drinking.	O	O	O	O	O	O
j. My family has been hurt by my drinking.	O	O	O	O	O	O
k. A friendship or close relationship has been damaged by my drinking.	O	O	O	O	O	O
l. My drinking has gotten in the way of my growth as a person.	O	O	O	O	O	O
m. My drinking has damaged my social life, popularity, or reputation.	O	O	O	O	O	O
n. I have spent too much or lost a lot of money because of my drinking.	O	O	O	O	O	O
o. I have had an accident while drinking or intoxicated.	O	O	O	O	O	O

The following questions refer to any drinking of alcohol you have done in your lifetime.

27. How much did you drink the last time you drank?

0 ENOUGH TO GET HIGH OR LESS

0 ENOUGH TO GET DRUNK

0 ENOUGH TO PASS OUT

28. Have you often had hangovers on Sunday or Monday mornings?

0 NO

0 YES

29. Have you had the "shakes" when sobering up (hands tremble, shake inside)?

0 NO

0 SOMETIMES

0 OFTEN

30. Have you gotten physically sick (e.g., vomit, stomach cramps) as a result of drinking?

0 NO

0 SOMETIMES

0 ALMOST EVERY TIME I DRINK

31. Have you had the "DTs" (delirium tremens) - that is, seen, felt or heard things not really there; felt very anxious, restless, and over-excited?

0 NO

0 SOMETIMES

0 SEVERAL TIMES

32. When you drink, do you stumble about, stagger, and weave?

0 NO

0 SOMETIMES

0 OFTEN

33. As a result of drinking, have you felt overly hot and sweaty (feverish)?

0 NO

0 ONCE

0 SEVERAL TIMES

34. As a result of drinking, have you seen things that were not really there?

0 NO

0 ONCE

0 SEVERAL TIMES

35. Have you panicked because you feared you may not have a drink when you need it?

0 NO

0 YES

36. Have you had blackouts ("loss of memory" without passing out) as a result of drinking?

0 NO, NEVER

0 SOMETIMES

0 OFTEN

0 ALMOST EVERY TIME I DRINK

37. Have you carried a bottle with you or kept one close at hand?

0 NO

0 SOME OF THE TIME

0 MOST OF THE TIME

38. After a period of abstinence (not drinking), have you ended up drinking heavily again?

0 NO

0 SOMETIMES

0 ALMOST EVERY TIME I DRINK

39. Have you passed out as a result of drinking?

0 NO

0 ONCE

0 MORE THAN ONCE

40. Have you had a convulsion (fit) following a period of drinking?

- 0 NO
- 0 YES
- 0 SEVERAL TIMES

41. Do you drink throughout the day?

- 0 NO
- 0 YES

42. After drinking heavily, has your thinking been fuzzy or unclear?

- 0 NO
- 0 YES, BUT ONLY FOR A FEW HOURS
- 0 YES, FOR ONE OR TWO DAYS
- 0 YES, FOR MANY DAYS

43. As a result of drinking, have you felt your heart beating rapidly?

- 0 NO
- 0 YES
- 0 SEVERAL TIMES

44. Do you almost constantly think about drinking and alcohol?

- 0 NO
- 0 YES

45. As a result of drinking, have you heard "things" that were not really there?

- 0 NO
- 0 YES
- 0 SEVERAL TIMES

46. Have you had weird and frightening sensations when drinking?

- 0 NO
- 0 ONCE OR TWICE
- 0 OFTEN

47. As a result of drinking, have you "felt things" crawling on you that were not really there (e.g., bugs, spiders)?

0 NO

0 YES

0 SEVERAL TIMES

48. With respect to blackouts (loss of memory)

0 HAVE NEVER HAD A BLACKOUT

0 HAVE HAD BLACKOUTS THAT LAST LESS THAN AN HOUR

0 HAVE HAD BLACKOUTS THAT LAST FOR SEVERAL HOURS

0 HAVE HAD BLACKOUTS THAT LAST FOR A DAY OR MORE

49. Have you tried to cut down on your drinking and failed?

0 NO

0 ONCE

0 SEVERAL TIMES

50. Do you gulp drinks (drink quickly)?

0 NO

0 YES

51. After taking one or two drinks, can you usually stop?

0 NO

0 YES

52. Have you had any of the following symptoms in the last 12 months?
Mark all that apply. (Please note this question refers only to the last 12 months.)

0 THE SHAKES

0 BEING UNABLE TO SLEEP

0 FEELING VERY NERVOUS OR RESTLESS

0 SWEATING

0 YOUR HEART BEATING FAST

0 NAUSEA OR VOMITING

0 HEADACHES

0 WEAKNESS

0 SEEING OR HEARING THINGS THAT OTHERS COULD NOT SEE OR HEAR

0 FITS OR SEIZURES

53. For each of the following drugs, please mark the box that best indicates how often in the past year you used each drug.

	HAVE NEVER TRIED	NO USE IN THE LAST YEAR	LESS THAN ONCE A MONTH	1 - 3 TIMES A MONTH	1 - 3 TIMES A WEEK	4 - 6 TIMES A WEEK	EVERY DAY
a. Marijuana or Hashish	0	0	0	0	0	0	0
b. Cocaine or Crack	0	0	0	0	0	0	0
c. Stimulants (amphetamines, uppers, speed, crank, crystal meth, bam)	0	0	0	0	0	0	0
d. Opioids (heroin, morphine, codeine, opium)	0	0	0	0	0	0	0

e. Other (please specify): | | | | | | | | | | | | | | | | | |

If you have used any of the drugs listed above, please answer questions 54 through 60; if you have not used any of the drugs, please SKIP to question #61 on page 14.

54. In the past 12 months, did your use of drugs ever interfere with your work at school, or a job, or at home?

0 YES (If YES, please answer #54a)

0 NO (If NO, please skip to #55)

54a. How often in the past 12 months did drugs interfere with your work at school, or a job, or at home?

0 ONCE OR TWICE

0 BETWEEN 3 AND 5 TIMES

0 BETWEEN 6 AND 10 TIMES

0 BETWEEN 11 AND 20 TIMES

0 MORE THAN 20 TIMES

55. During the past 12 months, were you ever under the influence of a drug in a situation where you could get hurt - like when driving a car or boat, using knives or guns or machinery, or anything else?

0 YES

0 NO

56. During the past 12 months, did you have any emotional or psychological problems from using drugs - such as feeling uninterested in things, feeling depressed, suspicious of people, paranoid, or having strange ideas?

0 YES

0 NO

57. During the past 12 months, did you have a strong desire or urge to use a drug that you could not keep from using it?

0 YES

0 NO

58. During the past 12 months, did you have a period of a month or more when you spent a great deal of time using drugs or getting over its/their effects?

0 YES

0 NO

59. During the past 12 months, did you ever use much larger amounts of drugs than you intended to or did you use it/them for a longer period of time than you intended to?

0 YES (If YES, please answer #59a)

0 NO (If NO, please skip to #60)

59a. How often in the past 12 months, did you use a much larger amount of drugs than you intended to or use it/them for a longer period of time than you intended to?

0 ONCE OR TWICE

0 BETWEEN 3 AND 5 TIMES

0 BETWEEN 6 AND 10 TIMES

0 BETWEEN 11 AND 20 TIMES

0 MORE THAN 20 TIMES

60. During the past 12 months, was there ever a time when you had to use more of a drug than you used to get the same effect you wanted?

0 YES

0 NO

BEHAVIOR

61. In order to compare our study with the results of other studies, we'd like to know if you have ever done any of the following things.

Have you:	YES	NO	DON'T KNOW
a. Had sex with a man?	O	O	O
b. Had sex with a woman?	O	O	O
c. Injected drugs?	O	O	O
d. Had sex with someone you know or believe to have been an IV or injected drug user?	O	O	O
e. Had sex with someone you know or believe to have been bisexual?	O	O	O
f. Received clotting factor for hemophilia or other blood clotting disorder?	O	O	O
g. Received transfusion of blood components other than clotting factor?	O	O	O

The next questions are about your sexual behavior. By sex we mean oral, vaginal, or anal sex, but NOT masturbation. When we talk about condoms, we mean both male as well as female condoms.

62. During the past 12 months, have you had sex?

O YES (If YES, please answer #63 - 66 below)

O NO [If NO, skip to #67 on Next Page]

63. During the past 12 months, with how many people have you had sex? | | | people

64. During the past 12 months, have you had sex with only males, only females, or with both males and females?

O ONLY MALES

O ONLY FEMALES

O BOTH MALES AND FEMALES

65. Thinking back about the last time you had sex, did you or your partner use a condom?

O YES

O NO

66. Thinking back about the last time you had sex, were you under the influence of alcohol or drugs?

O YES

O NO

67. Have you ever, even once, used a needle to inject any drug?
DO NOT include anything you took under a doctor's orders.

0 YES

0 NO [SKIP to #76 on the next page]

68. In the past 12 months, have you ever used a needle to inject any drug?

0 YES

0 NO [SKIP to #76 on the next page]

69. The last time that you used a needle to inject a drug, what drug did you inject?
(Check all that apply)

0 HEROIN

0 POWDER COCAINE

0 CRACK COCAINE

0 METHAMPHETAMINE

0 OTHER, specify

70. The last time you used a needle to inject a drug, was it a new sterile needle?
By sterile, we mean that it had never been used before, not even by you?

0 YES

0 NO

0 DON'T KNOW

71. The last time you used a needle to inject a drug, did you use cottons, a cooker, or rinse water that you knew or suspected someone else had used before?

0 YES

0 NO

0 DON'T KNOW

72. The last time you used a needle to inject a drug, did someone else use the needle after you?

0 YES

0 NO

0 DON'T KNOW

73. The last time you used a needle to inject a drug, did someone else use the cottons, cooker, or rinse water after you?

0 YES

0 NO

0 DON'T KNOW

74. The last time you used a needle to inject a drug, did someone use their syringe to squirt the drug into your syringe? This is sometimes called "backloading," "frontloading," or "splitting,"

0 YES

0 NO

0 DON'T KNOW

75. The last time you used a needle to inject a drug, did you use your syringe to squirt the drug into the syringe of someone else? This is sometimes called "frontloading," "backloading," or "splitting."

0 YES

0 NO

0 DON'T KNOW

SOCIAL ASPECTS OF HEALTH

76. For each of the following statements, fill in the circle if you strongly agree, agree, disagree, or strongly disagree.

	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE
a. I want to take an active role in the medical management of my disease and its complications	0	0	0	0
b. It is better to trust a doctor or nurse in charge of a medical procedure than to question what they are doing	0	0	0	0
c. I want to know as much as I can about the medical aspects of my disease and treatment	0	0	0	0
d. I'd rather have doctors and nurses make decisions about what's best rather than for them to give me a lot of choices	0	0	0	0

77. How often do you see or hear from relatives or close friends? Would you say less than once a month, about once a month, a few times a month, a few times a week, every day?

	LESS THAN ONCE A MONTH	MONTHLY	A FEW TIMES A MONTH	A FEW TIMES A WEEK	DAILY
a. Relatives?	0	0	0	0	0
b. Close friends?	0	0	0	0	0

78. How many close friends or family do you have with whom you feel at ease, can talk about private matters, or can call on for help?

0 NONE
0 ONE
0 TWO
0 THREE OR FOUR
0 FIVE TO EIGHT
0 NINE OR MORE

79. In response to having a medical illness, how often during the past four weeks have you done each of the following? Would you say all of the time, most of the time, a good bit of the time, some of the time, a little of the time, or none of the time?

	ALL OF THE TIME	MOST OF THE TIME	A GOOD BIT OF THE TIME	SOME OF THE TIME	LITTLE OF THE TIME	NONE OF THE TIME
a. Used my situation to change or grow as a person?	0	0	0	0	0	0
b. Avoided being with people in general?	0	0	0	0	0	0
c. Kept yourself from thinking too much about it?	0	0	0	0	0	0
d. Asked other people for advice and information?	0	0	0	0	0	0
e. Criticized or lectured yourself?	0	0	0	0	0	0
f. Tried to keep yourself from worrying about it?	0	0	0	0	0	0
g. Talked to someone about how you were feeling about having it?	0	0	0	0	0	0
h. Tried to keep it from bothering you?	0	0	0	0	0	0
i. Involved yourself in volunteer work or a community organization?	0	0	0	0	0	0

80. Are you an official member of a church or other place of worship?

- ○ YES
- ○ NO

81. How religious do you consider yourself?

- ○ NOT AT ALL RELIGIOUS
- ○ NOT VERY RELIGIOUS
- ○ SOMEWHAT RELIGIOUS
- ○ RELIGIOUS
- ○ VERY RELIGIOUS

82. During the past year, how often did you attend religious services?

- ○ NEVER
- ○ LESS THAN TWICE A YEAR
- ○ SEVERAL TIMES A YEAR
- ○ ABOUT ONCE A MONTH
- ○ TWO TO THREE TIMES A MONTH
- ○ EVERY WEEK
- ○ SEVERAL TIMES A WEEK
- ○ EVERYDAY

83. How frequently do you pray?

- ○ NEVER
- ○ LESS THAN TWICE A YEAR
- ○ SEVERAL TIMES A YEAR
- ○ ABOUT ONCE A MONTH
- ○ TWO TO THREE TIMES A MONTH
- ○ EVERY WEEK
- ○ SEVERAL TIMES A WEEK
- ○ EVERY DAY

84. How important is religion to you?

- ○ VERY IMPORTANT
- ○ IMPORTANT
- ○ SOMEWHAT IMPORTANT
- ○ NOT VERY IMPORTANT
- ○ NOT AT ALL IMPORTANT

85. When you have problems or difficulties in your life, how often do you seek spiritual comfort and support?

- ○ ALMOST ALWAYS
- ○ OFTEN
- ○ SOMETIMES
- ○ RARELY
- ○ NEVER

86. If you compare your life now to before HIV, would you say your life is:

- ○ BETTER NOW
- ○ WORSE NOW
- ○ ABOUT THE SAME AS BEFORE I KNEW I WAS HIV POSTIVE
- ○ DON'T KNOW

HEALTH CARE UTILIZATION

87. How many times have you used VA health care in the last 4 months?

a. For overnight stays in a hospital or nursing home

○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+

b. For outpatient care

○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+

88. How many times have you used health care outside the VA in the last 4 months?

a. For overnight stays in a hospital or nursing home

O O O O O O O O O O O O O O O O
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+

b. For outpatient care

O O O O O O O O O O O O O O O O
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+

89. Within the past 4 months, how many visits have you had with a **mental health professional** within the VA?

O O O O O O O O O O O O O O O O
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+

90. Within the past 4 months, how many visits have you had with a **mental health professional** outside the VA?

O O O O O O O O O O O O O O O O
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15+

The following questions ask for your views about your regular doctor. Your doctor will not be able to link your name to your responses.

91. Do you have one person you think of as your regular doctor?

O YES, VA

O YES, NON-VA

O NO

92. How many minutes does it usually take you to get to your regular doctor's office?

O 15 OR LESS

O 16 - 30

O 31 - 60

O 60 OR MORE

93. How would you rate the convenience of your regular doctor's office location?

- O VERY POOR
- O POOR
- O FAIR
- O GOOD
- O VERY GOOD
- O EXCELLENT

94. Thinking about talking with your regular doctor, how would you rate the following?

	VERY POOR	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT
a. Thoroughness of your doctor's questions about your symptoms and how you are feeling	O	O	O	O	O	O
b. Attention your doctor gives to what you have to say	O	O	O	O	O	O
c. Doctor's explanation of your problems or treatment that you need	O	O	O	O	O	O

95. Thinking about how well your regular doctor knows you, how would you rate your doctor's knowledge of what worries you most about your health?

- O VERY POOR
- O POOR
- O FAIR
- O GOOD
- O VERY GOOD
- O EXCELLENT

96. All things considered, how much do you trust your regular doctor?

NOT AT ALL											COMPLETELY
	O	O	O	O	O	O	O	O	O	O	
	1	2	3	4	5	6	7	8	9	10	

97. Do you know who to ask when you have questions about your care?

- 0 YES, ALWAYS
- 0 YES, SOMETIMES I DO
- 0 NO
- 0 DIDN'T HAVE ANY QUESTIONS

98. Do you know what the next step in your care will be?

- 0 YES, ALWAYS
- 0 YES, SOMETIMES
- 0 NO

99. Have any of the following been a problem for you in arranging for your medical care in the last 12 months? If so, how much of a problem?

	YES, A BIG PROBLEM	YES, A SMALL PROBLEM	NO, NOT A PROBLEM
a. Difficulty receiving care you and your doctor believed necessary	0	0	0
b. Not being able to get a referral to a specialist that you wanted to see	0	0	0

100. Overall, how would you rate the quality of care you received the past two months?

- 0 VERY POOR
- 0 POOR
- 0 FAIR
- 0 GOOD
- 0 VERY GOOD
- 0 EXCELLENT

MEDICATIONS

Most people with HIV have many pills to take at different times during the day, and find it hard to always remember their pills. Please tell us what you are doing. Don't worry about telling us that you don't take all your doses. We need to know what is really happening, not what you think we "want to hear." Please fill in the circle of the one response that best describes how you take your medications.

101. Do you take any medicine to treat your HIV infection?

- O YES (If YES, please answer #102 - 105 below)
- O NO (if NO, skip to #106 on the next page)

102. During the past 4 days, on how many days have you missed taking any of your doses?

- O NONE
- O ONE DAY
- O TWO DAYS
- O THREE DAYS
- O FOUR DAYS

103. Most anti-HIV medications need to be taken on a schedule, such as "2 times a day," or "3 times a day," or "every 8 hours." How closely did you follow your specific schedule over the last four days?

- O NEVER
- O SOME OF THE TIME
- O ABOUT HALF OF THE TIME
- O MOST OF THE TIME
- O ALL OF THE TIME

104. Did you miss any of your anti-HIV medication last weekend--last Saturday or Sunday?

- O YES
- O NO

105. When was the last time you missed any of your HIV medications?

- O WITHIN THE PAST WEEK
- O 1 - 2 WEEKS AGO
- O 2 - 4 WEEKS AGO
- O 1 - 3 MONTHS AGO
- O OVER 3 MONTHS AGO
- O NEVER SKIPPED

106. Do you take any prescription medicine to treat other medical problems you may have?

- O YES (If YES, please answer # 107 below)
- O NO (if NO, skip to #108)

107. Over the past 4 days, on how many days did you miss taking any of your doses?

- O NONE
- O ONE DAY
- O TWO DAYS
- O THREE DAYS
- O FOUR DAYS

SYMPTOMS

108. The following questions ask about symptoms you might have had during the past four weeks. Please fill in the circle of the one response that best describes this symptom.

	I DO NOT HAVE THIS SYMPTOM	I HAVE THIS SYMPTOM AND... IT DOESN'T BOTHER ME	IT BOTHERS ME A LITTLE	IT BOTHERS ME	IT BOTHERS ME A LOT
a. Fatigue or loss of energy?	O	O	O	O	O
b. Fevers, chills, or sweats?	O	O	O	O	O
c. Feeling dizzy or light headed?	O	O	O	O	O
d. Pain, numbness, or tingling in the hands or feet?	O	O	O	O	O
e. Trouble remembering?	O	O	O	O	O
f. Nausea or vomiting?	O	O	O	O	O
g. Diarrhea or loose bowel movements?	O	O	O	O	O
h. Felt sad, down, or depressed?	O	O	O	O	O
i. Felt nervous or anxious?	O	O	O	O	O
j. Difficulty falling or staying asleep?	O	O	O	O	O

	I DO NOT HAVE THIS SYMPTOM	I HAVE THIS SYMPTOM AND... IT DOESN'T BOTHER ME	IT BOTHERS ME A LITTLE	IT BOTHERS ME	IT BOTHERS ME A LOT
k. Skin problems, such as rash, dryness, or itching?	O	O	O	O	O
l. Cough or trouble catching your breath?	O	O	O	O	O
m. Headache?	O	O	O	O	O
n. Loss of appetite or change in the taste of food?	O	O	O	O	O
o. Bloating, pain, or gas in your stomach?	O	O	O	O	O
p. Muscle aches or joint pain?	O	O	O	O	O
q. Problems with having sex, such as loss of interest or lack of satisfaction?	O	O	O	O	O
r. Changes in the way your body looks, such as fat deposits or weight gain?	O	O	O	O	O
s. Problems with weight loss or wasting?	O	O	O	O	O
t. Hair loss or changes in the way your hair looks?	O	O	O	O	O

109. Do you think your symptoms are caused by the drugs you take to treat your HIV infection?

O YES O UNSURE O NO

110. Do you think your symptoms are caused by drugs you take to treat other medical conditions?

O YES O UNSURE O NO

QUALITY OF LIFE

111. Over the last 2 weeks, how often have you been bothered by any of the following problems?

	NOT AT ALL	SEVERAL DAYS	MORE THAN HALF THE DAYS	NEARLY EVERY DAY
a. Little interest or pleasure in doing things	O	O	O	O
b. Feeling down, depressed, or hopeless	O	O	O	O
c. Trouble falling/staying asleep, sleeping too much	O	O	O	O
d. Feeling tired or having little energy	O	O	O	O
e. Poor appetite or overeating	O	O	O	O
f. Feeling bad about yourself - or that you are a failure or have let yourself or your family down	O	O	O	O
g. Trouble concentrating on things, such as reading the newspaper or watching television	O	O	O	O
h. Moving or speaking so slowly that other people could have noticed. Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual	O	O	O	O
i. Thoughts that you would be better off dead or of hurting yourself in some way	O	O	O	O

112. If you checked off any problem listed above, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

- O NOT DIFFICULT AT ALL
- O SOMEWHAT DIFFICULT
- O VERY DIFFICULT
- O EXTREMELY DIFFICULT

Questions 113a-g are from the Beck Depression Inventory®-II (BDI®-II).
The BDI®-II is protected by federal copyright law.

114. These questions are about any physical limitations you might have.
For these activities, please indicate which response best describes you
by darkening the circle under the appropriate response after each statement.

	YES, I CAN DO THIS	YES, BUT ONLY SLOWLY	NO, I CANNOT DO THIS
a. Can you do heavy work at home, like scrubbing floors, lifting or moving heavy furniture?	O	O	O
b. Can you do moderate work at home like moving a chair or table, or pushing a vacuum cleaner?	O	O	O
c. Can you do light work around the house like dusting or washing dishes?	O	O	O
d. If you want to, can you participate in active sports such as swimming, tennis, basketball, volleyball or rowing a boat?	O	O	O
e. If you want to, can you run a short distance?	O	O	O
f. Can you walk uphill or upstairs?	O	O	O
g. Can you walk a block or more?	O	O	O
h. Can you walk around inside the house?	O	O	O
i. Can you walk to a table for meals?	O	O	O
j. Can you dress yourself?	O	O	O
k. Can you eat without help?	O	O	O
l. Can you use the bathroom without help?	O	O	O

These questions ask for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. Please answer each question by filling in the circle. If you are unsure about how to answer, please give the best answer you can.

115. In general, would you say your health is:

O EXCELLENT

O VERY GOOD

O GOOD

O FAIR

O POOR

The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

	YES, LIMITED A LOT	YES, LIMITED A LITTLE	NO, NOT LIMITED AT ALL
116. **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	0	0	0
117. Climbing **several** flights of stairs	0	0	0

During the past 4 weeks, have you had any of the following problems with your work or other daily activities as a result of your physical health?

118. **Accomplished less** than you would like

0 YES

0 NO

119. Were limited in the **kind** of work or other activities

0 YES

0 NO

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

120. A**ccomplished less** than you would like

0 YES

0 NO

121. Didn't do work or other activities as **carefully** as usual

0 YES

0 NO

122. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

0 NOT AT ALL

0 A LITTLE BIT

0 MODERATELY

0 QUITE A BIT

0 EXTREMELY

These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks -

	ALL OF THE TIME	MOST OF THE TIME	A GOOD BIT OF THE TIME	SOME OF THE TIME	A LITTLE OF THE TIME	NONE OF THE TIME
123. Have you felt calm and peaceful?	0	0	0	0	0	0
124. Did you have a lot of energy?	0	0	0	0	0	0
125. Have you felt downhearted and blue?	0	0	0	0	0	0

126. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

0 ALL OF THE TIME
0 MOST OF THE TIME
0 SOME OF THE TIME
0 A LITTLE OF THE TIME
0 NONE OF THE TIME

DEMOGRAPHICS

127. What is your date of birth? ☐☐ / ☐☐ / ☐☐☐☐
month day year

128. What is your sex?

0 MALE
0 FEMALE

129. What is the highest grade or year of school you completed?

0 NEVER ATTENDED SCHOOL OR ONLY KINDERGARTEN
0 GRADES 1 THROUGH 8 (ELEMENTARY)
0 GRADES 9 THROUGH 11 (SOME HIGH SCHOOL)
0 HIGH SCHOOL GRADUATE
0 GED
0 COLLEGE 1 YEAR TO 3 YEARS (SOME COLLEGE OR TECHNICAL SCHOOL)
0 COLLEGE GRADUATE
0 GRADUATE SCHOOL

130. What is your race (Mark one or more)?

- 0 AMERICAN INDIAN OR ALASKA NATIVE
- 0 ASIAN
- 0 BLACK OR AFRICAN AMERICAN
- 0 NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER
- 0 WHITE

131. What is your ethnicity?

- 0 HISPANIC OR LATINO
- 0 NOT HISPANIC OR LATINO

132. What is your current marital status?

- 0 MARRIED
- 0 DIVORCED
- 0 SEPARATED
- 0 WIDOWED
- 0 NEVER MARRIED
- 0 LIVING WITH PARTNER

133. How many persons live in your household (including yourself)? ☐☐ people

134. Are you currently...(mark all that apply)

- 0 EMPLOYED FOR WAGES
- 0 SELF-EMPLOYED
- 0 LOOKING FOR WORK AND UNEMPLOYED FOR MORE THAN ONE YEAR
- 0 LOOKING FOR WORK AND UNEMPLOYED FOR LESS THAN ONE YEAR
- 0 HOMEMAKER
- 0 STUDENT
- 0 RETIRED
- 0 UNABLE TO WORK

135. What is your annual household income?

- 0 LESS THAN $6,000
- 0 $6,000 TO $11,999
- 0 $12,000 TO $24,999
- 0 $25,000 TO $49,999
- 0 OVER $50,000

Thank you for completing our questionnaire.
Please return this to the Survey Coordinator who gave it to you.