Screening for Mental Health Conditions

This is a PDF version of the following document:
Module 2: Basic HIV Primary Care
Lesson 6: Screening for Mental Health Conditions

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Background

In the United States, people with HIV have a high prevalence of mental health conditions. This curriculum uses the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR) as the basis for screening and classification of these conditions.[1] Of note, however, earlier versions of the DSM were also utilized for the development of the specific screening tools we currently recommend.[2,3,4] In the DSM-5-TR, all psychiatric conditions meeting the criteria for diagnosis are referred to as mental disorders. For the purposes of this curriculum, we refer to mental disorders as mental health conditions. In addition, although people with HIV and mental health conditions often have comorbid substance use disorders. Mental health conditions are more prevalent among individuals experiencing poverty, homelessness, substance use, and/or incarceration. Among the disorders described in the DSM-5-TR, evidence suggests that major depression has the strongest overall impact on HIV outcomes, but certain less prevalent conditions, such as schizophrenia and bipolar disorder, often lead to a marked negative impact on lifespan in persons with HIV, especially if combined with concomitant substance use disorder. People with HIV may also experience neurocognitive deficits. This lesson reviews the widely-cited 2007 classification of these conditions, known as HIV-associated neuropsychiatric disorders, or HAND.[5] It also includes 2023 recommendations from the International HIV-Cognition Working Group, which added a different approach, but did not supplant, the HAND criteria.[6] People with HIV and neurocognitive problems may have other comorbidities that contribute to cognitive problems. These include aging, substance use, chronic hepatitis C, severe depression, and psychotic disorders.

Screening for Mental Health Conditions and Neurocognitive Disorders

This Topic Review will emphasize screening recommendations and tools for people with HIV to identify common mental health conditions, including depression, bipolar disorders, common anxiety disorders, and post-traumatic stress disorder (PTSD), as well as neurocognitive disorders. It is also important to consider that persons with HIV may have more than one psychiatric or neuropsychiatric diagnosis. Screening tools for Alcohol/Substance Use Disorders are addressed in the lesson on Substance Use Disorders. In addition, screening for delirium in persons with HIV will not be addressed in this review, but delirium should always be ruled out prior to making a psychiatric diagnosis, since delirium may indicate a life-threatening illness. Clinicians caring for individuals with HIV should be aware of the multiple challenges implicit in the screening, diagnosis, and management of mental health conditions and neurocognitive deficits. Therefore, clinicians should be prepared to assist their patients in obtaining access to appropriate, integrated neuropsychiatric treatment and treatment for neurocognitive deficits. A detailed discussion of definitions, diagnostic criteria, and treatment for particular DSM-5-TR conditions is beyond the scope of this review.

Mental Health Conditions and HIV

Prevalence of Mental Health Conditions ain People with HIV

Separate studies performed during different time periods have consistently shown that persons with HIV have relatively higher prevalence rates of various mental health conditions than are present among persons without HIV.[7,8,9,10,11] Several investigators have described a chronic neuroinflammatory state that exists in persons with HIV that may contribute to the high prevalence of depression among people with HIV.[12,13]

- **Depression Symptoms Reported in Medical Monitoring Project 2023 Cycle**: This survey, conducted in the United States from June 2023 through May 2024, evaluated 3,711 persons with HIV for the presence of depression during the 2-week period prior to the interview.[14] Using DSM-IV TR criteria, 16.9% reported depression, including 14.0% of participants reporting moderate or severe depression (using criteria of a PHQ-8 score ≥10) (Figure 1).[3,14] Because the Medical Monitoring Project largely includes data only from persons with HIV who are receiving care, these data may not entirely reflect rates of depression for all people with HIV in the United States.[14]
- **Anxiety Reported in Medical Monitoring Project 2023 Cycle**: In this Medical Monitoring Project survey, 21.2% of persons with HIV reported anxiety, including 8.6% with severe anxiety (Figure 2).[14] Because the Medical Monitoring Project largely includes data only from persons with HIV who are receiving care, these data may not entirely reflect rates of anxiety for all people with HIV in the United States.[14]
- **PTSD Meta-Analysis in Women with HIV**: In a meta-analysis of psychological trauma and post-traumatic stress disorder (PTSD) in women with HIV from the United States, investigators reported a PTSD rate of 30% among women with HIV, a rate approximately five times higher than among women without HIV.[15]

Mental Health Conditions and Impact on HIV Transmission

For people with HIV, mental health conditions may increase HIV transmission risk, often in the context of substance use.[16] Since persons with HIV who regularly take antiretroviral therapy and consistently maintain suppressed HIV RNA levels do not transmit HIV to sex partners, any factor that negatively influences antiretroviral adherence can interfere with this antiretroviral medication-related transmission benefit.[17] Major depression has been linked to increased rates of nonadherence to antiretroviral therapy, thus raising the likelihood of HIV transmission to partners.[18,19,20] In addition, anxiety, depression, and bipolar disorder have all been linked to increased sexual activity.[21,22,23] Treatment for mental health conditions, including treatment of substance use disorders, should be part of overall efforts to reduce HIV transmission.[24,25,26] A Duke University psychiatry group has generated a conceptual model outlining the impact of mental health treatment on HIV transmission risk behavior in persons with HIV (Figure 3).[25]

Impact of Mental Health Conditions on the HIV Care Continuum

The presence of untreated mental health conditions in persons with HIV correlates with decreased initiation of antiretroviral therapy, reduced medication adherence, and lower rates of viral suppression, all of which have significant implications for individual health.[27] Studies have established a relationship between reduced adherence with antiretroviral therapy and symptoms of depression, post-traumatic stress disorder (especially in those patients with concomitant depression), and bipolar disorder.[19,23,28,29] Post-traumatic stress disorder has also been shown to predict increased HIV symptomatology among both men and women with HIV, high rates of emergency room utilization, and increased HIV-related morbidity.[30,31]

Impact of Mental Health Conditions on Morbidity and Survival

Mental health conditions have been shown to predict adverse outcomes in some groups of individuals with HIV who have a psychiatric condition. In particular, untreated depression significantly worsens adherence to

antiretroviral medication, decreases the likelihood of full virologic suppression or CD4 cell recovery, and appears to increase the risk of disease progression and death.[32] Among individuals with HIV, those with mental health conditions experience increased morbidity and mortality when compared to individuals who do not have these conditions.[33] Certain health problems are inherently increased in general with mental health conditions, such as the well-established association of major depression with heart disease. In addition, some psychotropic medications have the unfortunate side effect of weight gain, contributing to obesity and metabolic syndrome. Further, several studies have shown that anxiety and depression in people with HIV are associated with a decline in cognitive functioning, particularly in learning and memory.[34,35]

Benefit of Mental Health Care on HIV Outcomes

Among persons with HIV who have mental health conditions, treatment can improve psychiatric symptoms as well as improve adherence to antiretroviral therapy and overall HIV outcomes.[36] In some patients, the diagnosis of a mental health condition may facilitate closer monitoring and medical scrutiny, which fosters engagement in care and improved adherence rates. The following studies highlight evidence that addressing mental health care can have a major, favorable impact on HIV outcomes.

Neurocognitive Disorders in People with HIV

The term HIV-associated neurocognitive disorder (HAND) is used to describe the spectrum of neurocognitive dysfunction that includes asymptomatic neurocognitive impairment (ANI), mild neurocognitive disorder (MND), and HIV-associated dementia (HAD).[37] These three conditions have been classified based on criteria established by consensus research definitions (Table 1).[5]

Estimates of Neurocognitive Disorders in People with HIV

Cognitive disorders are widespread in the general population, with prevalence estimated to be 5 to 7% in most parts of the world; age is the major predictive factor for the development of dementia, and the prevalence of dementia nearly doubles every 10 years after age 60.[38] Overall, adults with HIV have poorer cognitive performance compared with those without HIV.[8,39,40] The prevalence of HIV-associated neurocognitive disorders (HAND) is estimated to be in the range of 25 to 50%.[39,41,42] In the Multicohort AIDS Study, only 2% of participants met the criteria for HIV-associated dementia, which is a significant drop from the 10 to 15% prevalence of HIV-associated dementia prior to the availability of effective antiretroviral therapy.[39] In contrast, the prevalence of milder forms of HAND had not declined despite effective antiretroviral therapy, though the study results were complicated by advanced immunosuppression among participants (70% had a CD4 nadir below 200 cells/mm^3).[39]

Factors Associated with Neurocognitive Decline in People with HIV

In persons with HIV, factors associated with neurocognitive decline include older age, low nadir CD4 count, detectable plasma HIV RNA levels, previous central nervous system (CNS) injury, and comorbid conditions, such as hypertension, insulin resistance, viral hepatitis, and substance use disorder.[8,39,43] In addition, major depression, another common comorbid condition in persons with HIV, carries a significant burden of cognitive impairment that is reversible in part with the treatment of depression.[44,45] The Multicohort AIDS Study found that asymptomatic neurocognitive impairment doubles the risk of developing symptomatic HAND compared to a diagnosis of normal cognition.[41] Among individuals with cognitive impairment and suppressed HIV RNA levels, intensification of antiretroviral therapy does not improve the cognitive impairment.[46]

Differential Diagnosis of Neurocognitive Impairment

Although HAND describes a spectrum of neurocognitive impairment from mild to severe, it is important to recognize that persons with HIV continue to be at risk for other causes of neurocognitive decline, including cerebrovascular disease, severe psychiatric disorders, Alzheimer's disease, metabolic disorders (such as hypothyroidism), alcohol and drug use disorders, side effects of psychotropic drugs, neurotoxicity related to certain antiretroviral medications, previous or current central nervous system opportunistic infections (and their sequelae), or other neurological diseases.[8,47,48,49,50] Treatable causes of neurocognitive disorders, such as depression, thyroid disease, B12 deficiency, syphilis, an opportunistic infection, and tumors, should be identified and addressed.

HIV-Associated Brain Injury (HABI)

In 2023, an International HIV-Cognition Working Group issued a Consensus Statement that outlined recommendations for a new approach to cognitive impairment and causes of brain injury in people with HIV.[6] This working group has proposed a shift from using the HAND concept to an emphasis on conceptualizing brain injury in people with HIV as either (1) injury directly caused by HIV (HIV-associated brain injury [HABI]) or (2) injury from causes that are not directly caused by HIV (e.g., cerebrovascular disease, traumatic brain injury, neurodegenerative disorders).[6] In this context, HABI is classified based on whether plasma HIV RNA levels are suppressed or not suppressed.[6] Further, for individuals with suppressed plasma HIV RNA levels and evidence of brain injury, the working group characterized the brain injury as legacy

(inactive brain injury from pretreatment damage) or active (ongoing brain injury leading to clinical and/or radiological progression).[6] The HIV-Cognition Working Group provided six main recommendations that summarize a new diagnostic approach to cognitive impairment in people with HIV (Table 2).[6]

Overview of Screening Tools

Barriers to the Usefulness of Screening Tools

The primary limitation of screening tools for mental health conditions is the low rates of further diagnostic evaluation and linkage to and retention in mental health care that follows the initial screening. This problem has been well demonstrated with depression screening tools.[51,52] Barriers to treatment have led to several new team-based models for delivering mental health services within primary care; studies of these new models are promising, but they are not often conducted in settings where HIV care is delivered.[53] Although people with schizophrenia and other psychotic disorders have an increased risk of acquiring HIV, simple and reliable screening tools for these conditions are not available. Asking patients about prior psychiatric diagnoses, the use of psychotropic medications, and a history of psychiatric hospitalization is helpful in detecting these serious mental health conditions.

Ideal Aspects of Screening Tools in Primary Care

Practical screening tools for use in the primary care setting should be brief, easily scored, free, evidence-based, and accessible to a range of providers without specific training. In addition, screening tests should prioritize conditions for which treatment is available that directly targets the disease and improves outcomes.[54] Most of the common mental health conditions seen among people with HIV have effective treatments. An ideal screening test for a mental health condition will accurately identify individuals with the clinical condition of interest without diagnosing individuals who do not have the condition. This is referred to as the sensitivity (the probability that a test is positive when illness is present) and specificity (the probability that a test is negative when illness is absent) of a screening test. In addition, the test should ideally identify persons with the condition while not falsely categorizing people without the condition as having the condition; this is referred to as the positive predictive value.

Follow-Up for a Positive Screen

A positive screen for a mental health condition usually needs to be followed by a further clinical diagnostic evaluation to clarify that the condition crosses the threshold for a true mental health condition. Unfortunately, there are no biological or laboratory tests that can be conducted in clinical care settings that diagnose a mental health condition. The diagnostic accuracy of the screening test can be improved by testing for medical conditions that can cause delirium and dementia, and by screening for the presence of a substance use disorder with alcohol and/or other drugs. Several screening tools for the most common mental health conditions encountered in primary care are described below, with links provided to the screening tools.

Depression Screening Tools

In June 2023, the United States Preventive Services Task Force (USPSTF) updated the screening recommendation for Depression and Suicide Risk in Adults (including women who are pregnant or postpartum), providing a Grade B recommendation for screening for major depression and a Grade I recommendation for suicide risk screening.[55] The USPSTF recommendations state, “It is important that persons who screen positive are evaluated further for diagnosis and, if appropriate, are provided or referred for evidence-based care.”[55] The HIVMA/IDSA Primary Care Guidance recommends screening people with HIV for depression at least annually, and more frequently if needed, using the patient health questionnaire 9 (PHQ-9).[56] The PHQ-9 and PHQ-2 are the most commonly used screening tools, as described below, but the 2-item PRIME-MD and Hospital Anxiety and Depression Scale (HADS) are other, less used, available options.[57,58,59]

Patient Health Questionnaire-9 (PHQ-9)

The Patient Health Questionnaire-9 (PHQ-9) can be self-administered or administered by a health professional. The questionnaire scores each of the 9 DSM-5 criteria on a scale of 0 (not at all) to 3 (nearly every day) for items in the survey during the most recent 2 weeks. The PHQ-9 was designed to serve as a multipurpose instrument for screening, diagnosing, monitoring, and measuring the severity of depression and has been validated across diverse patient populations.[60,61]

- **Interpretation**: The PHQ-9 score ranges from 0 to 27, with higher scores correlating with a greater likelihood of major depression (Figure 4).[60] The following PHQ-9 score ranges have been shown to correlate with different degrees of depression: 5 to 9 (mild), 10 to 14 (moderate), 15 to 19 (moderately severe), and 20 to 27 (severe).[60] A cumulative score of 10 points or higher has 88% sensitivity and specificity for major depression. For individuals who score 1 or higher on any question, an additional tenth question is asked to assess how these problems impact function at home, at work, and with others.
- **Recommendation**: Based on both clinical practice and a review of the literature, a PHQ-9 score of 10 or higher is often used as the basis for referring individuals for further assessment of depression.[62,63] This further evaluation is essential because a PHQ-9 score of 10 or greater substantially overestimates the prevalence of major depression.[64] If prompt further diagnostic evaluation is not available, the clinician should use clinical judgment to diagnose and manage depression, taking into account the duration and severity of the depression, its impact on functioning, and the individual’s treatment preferences. Moderately severe depression or severe depression warrants treatment using antidepressants, psychotherapy, and/or a combination of both. In addition, any positive response to question 9 (presence and duration of suicide ideation) warrants immediate further evaluation to determine if there is an imminent risk of self-harm. Suicide screening instruments, including the PHQ-9, have not been shown to significantly predict near-term outcomes, so additional risk stratification may be necessary.[65]

Patient Health Questionnaire-2 (PHQ-2)

The Patient Health Questionnaire-2 (PHQ-2) is a 2-item, validated screening tool that uses the first two questions of the PHQ-9 that ask about the frequency of depressed mood and anhedonia (the first two DSM-5 criteria for diagnosing major depression).[66] The PHQ-2 focuses on the past 2 weeks and grades answers on a 4-point scale.

- **Interpretation**: The PHQ-2 score ranges from 0 to 6. Using a cutoff score of 3, the PHQ-2 has a sensitivity of 83% and a specificity of 90% for major depressive disorder. In one study, investigators concluded a cutoff score of 3 was the optimal cut point for screening, with the qualification that moving the cut point to 2 would enhance sensitivity and moving to 4 would increase specificity (Figure 5).[66]

- **Recommendation**: The PHQ-2 functions as a brief, practical, first-step screening tool intended to identify individuals who require additional evaluation with another instrument, such as the PHQ-9, or a direct diagnostic psychiatric interview.[67] The PHQ-2 should not be used as a final diagnostic tool for depression.

Anxiety Disorder Screening Tools

Generalized anxiety disorder (GAD) and panic disorder are two of the most common anxiety disorders in the United States. In people with HIV, treatment of these disorders has been shown to improve patient outcomes.[68] In June 2023, the United States Preventive Services Task Force (USPSTF) issued screening recommendations for Anxiety Disorders in Adults (including pregnant and postpartum women), providing a Grade B recommendation for those younger than 65 years of age and a Grade I Statement for those 65 years of age and older.[69] The USPSTF summary recommends further evaluation for persons who screen positive and, if appropriate, provide (or refer to) evidence-based care.[69] The HIVMA/IDSA Primary Care Guidance recommends screening for anxiety in persons with HIV using either the Generalized Anxiety Disorder-7 (GAD-7) or GAD-2, with screening taking place at the initial evaluation and annually thereafter.[56]

Generalized Anxiety Disorder-7 (GAD-7)

The 7-item Generalized Anxiety Disorder-7 (GAD-7) anxiety scale is a brief, self-administered questionnaire that has been validated in the general population to identify patients with probable generalized anxiety disorder.[70,71,72] The questionnaire includes questions about anxiety symptoms occurring in the past 2 weeks.

- **Interpretation**: The GAD-7 scores can range from 0 to 21. A major study identified a cut-point score of 10 as having optimized sensitivity (89%) and specificity (82%) for diagnosing generalized anxiety disorder (Figure 6).[72] Score categories correlate with different levels of anxiety: 0–4 (minimal), 5 to 9 (mild), 10 to 14 (moderate), and 15 to 19 (severe). A meta-analysis suggested using a cutoff score of 8 to optimize sensitivity without compromising specificity.[73]
- **Recommendation**: Individuals who meet the threshold for a positive GAD-7 screen (a score of 8 or above) should ideally have a complete diagnostic evaluation.

Generalized Anxiety Disorder-2 (GAD-2)

The 2-item Generalized Anxiety Disorder-2 (GAD-2) anxiety scale is a very brief screening tool derived from the first two questions of the GAD-7, asking if the individual has felt nervous, anxious, or on edge and asking if they have not been able to stop or control their worrying in the preceding 2 weeks.[74]

- **Interpretation**: The two items are scored as follows: 0 (not at all), 1 (several days), 2 (more than half the days), or 3 (nearly every day), with a total score ranging from 0 to 6. A score of ≥3 has a sensitivity of 81% and specificity of 86% for generalized anxiety disorder.[75]
- **Recommendation**: A score of ≥3 is considered a positive screen and should be followed up by a full GAD-7.

Patient Health Questionnaire for Panic Disorder (PHQ-PD)

This 5-item screening instrument is one subset of questions (questions 3a-d and 4a-k) derived from the longer Patient Health Questionnaire (PHQ), which itself is a short, self-reported instrument derived from a physician-administered PRIME-MD interview. The PHQ-PD (also called the panic module of the PHQ) has been found to be a valid screening instrument with a sensitivity of 44 to 66% and a specificity of 87 to 95%, depending on the scoring algorithm that is applied.[76] Using a single screening question taken from the PHQ-PD module (e.g., question 3a: “In the last 4 weeks, have you had an anxiety attack—suddenly feeling fear or panic?”) improves sensitivity to 71% but drops specificity to 84%.

- **Interpretation**: A positive score on the original panic module is indicated with a positive (*yes*) answer on all four questions 3a-d plus a positive (*yes*) answer on at least four items from questions 4a-k. Modified versions of the test improve sensitivity by requiring only 2 or 3 positive answers for questions 3a-d. The most sensitive version of the panic module screener is the single screening

question 3a; a *yes* answer to this single question is considered a positive screen.

- **Recommendation**: Many experts recommend using the single screening question (question 3a) since it has better psychometric properties than the full PHQ-PD algorithm.[76] Moreover, because primary care settings do not usually screen for panic disorder, adding only one question minimizes any additional burden to screening procedures already in place. Individuals with a positive screening require follow-up with a formal diagnostic procedure.

Post-Traumatic Stress Disorder (PTSD) Screening Tools

There is limited evidence to support screening the civilian primary care population for post-traumatic stress disorder, and the United States Preventive Services Task Force does not address PTSD screening. In contrast, other organizations, including the National Institute of Health Care and Excellence in the United Kingdom (NICE-UK), recommend screening for PTSD when there is known exposure to a traumatic stressor.[77] Multiple PTSD screening instruments are available, including the 5-item Primary Care PTSD Screen from DSM-5 (PC-PTSD-5), the 17-item PTSD Checklist, the 4-item Startle-Physiologic Arousal-Anger-Numbness (SPAN), the 7-item Breslau's scale, the 10-item Trauma Screening Questionnaire, and the Single-Item PTSD Screener.[77,78,79] Among these screening tools, the PC-PTSD-5 test (five items) appears to be the best single screening test for PTSD for use in primary care.[78]

Primary Care Post-Traumatic Stress Disorder (PC-PTSD)

The Primary Care PTSD for DSM-5 (PC-PTSD-5) screening test is a 5-item scale that includes questions about symptoms unique to PTSD (re-experiencing, avoidance, numbness, hyperarousal, and feelings of guilt or blame).[79] One study found that the previously used 4-item PC-PTSD was more effective when combined with the General Health Questionnaire-12 (GHQ-12), which is a set of 12 questions used to screen for nonpsychotic psychiatric disorders and graded on a 4-point response scale.[80]

- **Interpretation**: Different studies recommend different cutoff scores for a positive screen. A study involving 398 Veterans patients at a primary care clinic found a score of 3 correlated with 95% sensitivity and 85% specificity for the diagnosis of PTSD (Figure 7).[78,79] Another large study that used data extracted from clinical databases for Veterans Affairs primary care patients used a score of 2 or greater as the cutoff for a positive PC-PTSD screen.
- **Recommendation**: Individuals who screen positive on the PC-PTSD screening test qualify for additional evaluation from the primary care provider or a mental health practitioner that includes an interview evaluating PTSD criteria from the DSM-5.

Bipolar Disorder Screening Tool

Bipolar disorder encompasses a spectrum of clinical disorders (bipolar I disorder, bipolar II disorder, and cyclothymic disorder) consisting of episodes of manic, hypomanic, and depressive symptoms. The heterogeneous presentation of bipolar disorder can make it difficult to detect this disorder through screening, and lifetime prevalence estimates of bipolar disorder vary widely across studies.[81] The National Comorbidity Survey estimates that the lifetime and 12-month prevalence for bipolar I disorder is 1.0% and 0.6%, respectively; for bipolar II disorder, these numbers are 1.1% and 0.8%.[82] Although there are no formal recommendations for screening for bipolar disorder, some experts recommend that primary care clinicians implement selective screening for bipolar disorder in patients with known depression, anxiety, or substance use disorders.[81]

Mood Disorders Questionnaire (MDQ)

The Mood Disorders Questionnaire (MDQ) can be used to screen for a lifetime history of mania or hypomania. The MDQ consists of 13 *yes* or *no* questions based on DSM-5 criteria for bipolar disorder, with two additional items to assess the frequency and severity of *yes* responses. In primary care, evaluation of whether a person has bipolar disorder arises most frequently in the context of beginning an antidepressant medication, since these medications can precipitate mania in vulnerable individuals. The MDQ is not a practical screening tool for most clinicians, primarily because it requires asking so many questions. Accordingly, some clinicians may find that asking a few pointed questions during history taking can be useful in ruling out a history of mania: (1) “Have you ever been told that you have manic-depressive illness or bipolar disorder?” and (2) “Has there ever been a period of time when you were not your usual self, and you had much more energy than usual?” These questions parallel two of the items on the MDQ. Any *yes* answer would then lead to further inquiry.[83,84]

- **Interpretation**: In the primary care setting, a score of 7 on the MDQ has a sensitivity of 43% and a specificity of 95% for detecting any type of bipolar disorder. In the mental health setting, diagnostic characteristics are better overall: for a score of 7, sensitivity is 81%, and specificity is 85% (Figure 8).[84]
- **Recommendation**: Based on data showing low sensitivity but high specificity (and high negative predictive value), bipolar disorder screening tools, such as the MDQ, may be utilized most appropriately to rule out bipolar disorder in patients presenting with depression, rather than as a general screening tool.[85,86]

Neurocognitive Screening Tools

Recommendations to Screen for Neurocognitive Disorders

The United States Preventive Services Task Force (USPSTF) has found insufficient evidence to recommend for or against screening for cognitive impairment in older adults in the general population in the absence of known impairments.[87] Considering that as many as 50% of persons with HIV have some form of HIV-associated neurocognitive disorder, most experts recommend that persons with HIV should ideally have a baseline neurocognitive assessment, with follow-up screening every 6 to 12 months for individuals at high risk for HAND and every 12 to 24 months in persons at lower risk.[88] From a practical standpoint, however, this recommendation is often not implemented because existing clinical screens do not perform well in identifying milder forms of HAND. Therefore, identifying and developing practical screening tools for individuals with HIV that can detect milder forms of HAND and distinguish among the different HAND disorders is essential.

Screening Tools for Neurocognitive Disorders

There is no clear consensus for which of the currently available screening tools to use. The primary care literature offers four brief screening tools that are not specific to the diagnosis of HAND but are validated for general use in the primary care setting (Mini-Mental State Examination, General Practitioner Assessment of Cognition, Memory Impairment Screen, and Mini-Cognitive Assessment Instrument). The American Academy of Neurology acknowledged in its 2001 report on early detection of neurocognitive impairment that more research is needed to help clinicians differentiate among available screening instruments.[89,90,91] Several HIV-specific neurocognitive screening tools have been developed, but a consensus panel of experts on HIV neurocognitive disorders has concluded that no single screening test is appropriate in all clinical situations—the choice of test may vary with patient population, provider experience and preference, cost, and time—and further acknowledges that all the available tools are less sensitive for detecting milder forms of cognitive impairment.[88] At the present time, a comprehensive neuropsychological assessment remains the gold standard for diagnosing HIV-associated neurocognitive disorders.

General Population Neurocognitive Screening Tools

Mini-Mental State Exam (MMSE)

The MMSE is among the oldest screening tools for cognitive impairment. The MMSE, which takes approximately 5 to 10 minutes to administer, includes a series of questions that cover 7 cognitive domains: orientation, registration, attention and calculation, recall, language, and construction.[92,93] A score of 24 points or lower (out of a total of 30 points) represents cognitive impairment. Most experts agree that the MMSE is a weak tool for diagnosing HAND.[94,95] Due to poor performance in evaluating HAND in persons with HIV (and the logistical problems obtaining this test), we do not recommend using MMSE as a neurocognitive screening tool for HAND.

Mini-Cognitive Assessment Instrument (Mini-Cog)

The Mini-Cog is a test consisting of a three-word registration, followed by a clock-drawing test, and then followed by three-word recall.[96] Patients receive 0 to 3 points based on the number of items recalled, and 0 or 2 points for clock drawing (a correct clock should have all the numbers placed appropriately, with the hands pointing to the time designated by the examiner). A total score of 0-2 indicates dementia. As a screening tool for mild cognitive impairment and dementia, based on a cutoff score of 2, the test has sensitivity ranging from 76 to 99% and specificity ranging from 73 to 93% across studies.[89,97] Because of its speed, accuracy, and lack of requirement for patient fluency in English, some primary care providers suggest using this test as the initial screen, with perhaps the highest clinical utility when suspicion of cognitive impairment is low.[89] Again, the Mini-Cog is not specific to HAND.

Memory Impairment Screen (MIS)

The MIS is a 4-minute, 4-item delayed, free, and cued recall test.[98] The patient is given a piece of paper with the names of four different items (an animal, a vegetable, a city, and a musical instrument). The patient then counts from 1 to 20 and then back to 1; they are then asked to recall the names of the four items. Items recalled without cueing earn 2 points each; items recalled with cueing earn 1 point each. As a screening tool for dementia, based on a cutoff score of 5, the sensitivity of the MIS is 86%, and the specificity is 91%.[89]

Montreal Cognitive Assessment (MOCA)

The MOCA is a free, validated, online instrument available in many languages to screen for mild cognitive impairments. The MOCA takes approximately 10 to 15 minutes to administer and consists of 30 items that measure function in 8 cognitive domains.[99] A score of 26 points or lower (out of a maximum of 30) indicates cognitive impairment. The MOCA has been found to be more sensitive than the Mini-Mental Status Exam (MMSE) at detecting mild cognitive impairment in the general population.[90,100] Among individuals with HIV, the MOCA has only moderate sensitivity and poor specificity for detecting mild cognitive impairment.[99]

Rowland Universal Dementia Assessment Scale (RUDAS)

The Rowland Universal Dementia Assessment Scale (RUDAS) is a brief, 6-item cognitive screening tool that assesses executive function, memory, language, and perceptual-motor skills.[101] It was specifically developed to reduce the impact of educational and cultural bias in the cognitive screening process.[101] When used as a dementia screening measure with a cutoff score of 23, RUDAS demonstrates sensitivity ranging from 77 to 82% and specificity ranging from 83 to 86%.[101,102] The diagnostic performance of RUDAS is comparable to that of the MMSE. Although RUDAS has not been validated in persons with HIV, it has been validated across diverse cultural and socioeconomic settings and it is particularly well suited for use in culturally and linguistically different populations.[102]

HIV-Specific Neurocognitive Screening Tools

HIV Dementia Scale (HDS) and Modified HIV Dementia Scale (M-HDS)

The HIV Dementia Scale (HDS) is a 4-item test that assesses 4 cognitive domains: memory/recall, attention/learning, psychomotor functioning, and eye movements (visuoconstruction); the maximum score on the HDS is 16.[99,103,104] The HDS was originally developed in 1995 and found to be superior to the Mini-Mental Status Exam for identifying HIV-associated dementia. In one study, using an HDS cutoff score of 10 or less for identifying HIV dementia, the HDS performed with a sensitivity of 80%, specificity of 91%, and positive predictive value of 78%.[103] The HDS has been found to have inadequate sensitivity and specificity for detecting milder forms of cognitive impairment and has been difficult for non-neurologists to administer, given the need to evaluate antisaccadic eye movements.[99,105] A modified version of the HDS (M-HDS), which eliminates the evaluation of antisaccadic eye movement, is a more practical screening tool for clinicians and non-neurologists.[106]

International HIV Dementia Scale (IHDS)

In 2005, the International HIV Dementia Scale (IHDS) was developed by Sacktor and colleagues and adopted for use in global settings to address culturally specific elements of the original HIV Dementia Scale and trouble administering the anti-saccadic errors test.[107,108] The IHDS test has three tasks that evaluate motor speed, psychomotor speed, and memory recall: timed finger tapping, timed alternating hand sequence test, and 4-item recall at 2 minutes.[108] The maximum score is 12 points.[108] Patients with a score of 10 or lower should undergo further evaluation for possible dementia.[108] A meta-analysis showed this test performed well when screening for dementia but had low accuracy for milder HAND conditions.[105]

European AIDS Clinical Society (EACS) Cognitive Screen

The European AIDS Clinical Society recommends initial screening for cognitive impairment using 3 questions related to memory loss, reasoning, and attention. The questions are graded as *never*, *hardly ever*, or *yes*, *definitely*; an answer of *yes, definitely* on at least one question is considered to be an abnormal screen**.[**9**]**

Integrating Mental Health Screening into HIV Care

Integrating Screening into Primary Care

Models for integrating the evaluation and management of mental health conditions into the primary care setting have focused primarily on depressive disorders; key elements of this integrative approach are highlighted in the recent United States Preventive Services Task Force (USPSTF) recommendation that endorses routine screening for depression in the general adult population, including pregnant and postpartum women.[109] The USPSTF statement indicates that implementation of the screening recommendation is best achieved through a collaborative, multidisciplinary, team-based care model developed by the Community Preventive Services Task Force. This model uses case managers to connect primary care providers, patients, and mental health providers with the stated goals of increasing screening and evidence-based treatment as well as improving clinical and community support for patient engagement in self-management. In this model, providers are responsible for screening patients, initiating treatment, and ensuring proper referral, while the case managers provide patient education, tracking, and management of the treatment plan.

Integrating Mental Health Screening in HIV Care Settings

Depression Treatment Cascade

Given the high prevalence of mental health conditions, particularly depression, among persons with HIV, collaborative care models that allow for mental health treatment within the HIV medical home are paramount.[110] A depression treatment cascade, mirroring the well-known HIV treatment cascade, has been published, and it highlights the attrition along the continuum from depression diagnosis to effective treatment.[110] According to this cascade, 18% of individuals with HIV and depression are receiving any treatment for depression, 7% are receiving adequate treatment, and only 5% are in remission (Figure 9).[110] There is also interplay between the two cascades, since depression is recognized to decrease engagement in HIV care and adherence to antiretroviral medication.[110]

Collaborative Care Models

Despite the recognized mental health treatment gap, there are limited data related to evidence-based strategies that can be integrated into HIV primary care. Some proposed solutions include co-located services and embedded mental health providers. Just as the initiation of HIV care is more likely when diagnosis occurs at a site that offers co-located medical care, mental health treatment is also more likely when it is co-located within the familiar setting of a patient's medical home.[111,112] Collaborative care models to link antiretroviral and antidepressant management have also been tested in clinical trials. One such collaborative model, termed measurement-based care, has reported improvement in depression among participants. Measurement-based care is a decision support model for integrating antidepressant management into routine HIV care, in which depression case managers use metrics to give HIV primary care clinicians antidepressant treatment recommendations.[110,113]

Limits of Collaborative Care Models

It is important to note that collaborative care models in primary care are targeted for people who have mild to moderate mental health conditions and may not be able to provide the full range of services needed by people with HIV who have serious mental health conditions, such as bipolar disorder, schizophrenia, and other psychotic conditions.

Summary Points

- Among adults in the United States, the prevalence of depression, anxiety, and PTSD is significantly higher among adults with HIV than in adults without HIV.
- There is an increased risk for HIV acquisition and HIV transmission associated with certain mental health conditions, and mental health conditions have been associated with decreased utilization of antiretroviral therapy and predict worse HIV disease outcomes.
- Practical screening tools for use in the primary care setting should be brief, easily scored, free, and evidence-based. Screening tools for some of the most common mental health diagnoses encountered in primary care include the 2-item PRIME-MD, the PHQ2 and PHQ-9 (for depression), and the GAD-7 (for generalized anxiety disorder). A positive result on any screening test requires further evaluation.
- HAND likely affects 50% of people with HIV, with older age representing the greatest risk factor. Additional risk factors for HAND include low nadir CD4 count, previous central nervous system injury, detectable plasma HIV RNA levels, and comorbidities such as hypertension, insulin resistance, viral hepatitis, depression, and substance use disorder.
- HAND is subdivided into three categories based on the severity of disease: (1) asymptomatic neurocognitive impairment, (2) mild neurocognitive disorder, and (3) HIV-associated dementia.
- Screening tools for neurocognitive disorders include, among others, the MMSE, Mini-Cog, MIS, MOCA, RUDAS, European AIDS Clinical Society Cognitive Screen, HIV Dementia Scale, and the International HIV Dementia Scale.
- Neurocognitive disorders screening tools work best when screening for HIV-associated dementia, and they do not reliably detect milder forms of HIV-associated neurocognitive disorders.
- Meeting the needs of people with both HIV and the most serious mental health conditions, such as bipolar disorder and schizophrenia, is not well addressed in the common models proposed for integrating primary and HIV care along with care for people with mild to moderate mental health conditions.

Citations

1. American Psychiatric Association (2022). Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR).
[American Psychiatric Association] -

2. American Psychiatric Association (1994). Diagnostic and Statistical Manual of Mental Disorders, 4th Edition.
[American Psychiatric Association] -

3. American Psychiatric Association (2000). Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR).
[American Psychiatric Association] -

4. American Psychiatric Association (2013). Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5).
[American Psychiatric Association] -

5. Antinori A, Arendt G, Becker JT, et al. Updated research nosology for HIV-associated neurocognitive disorders. Neurology. 2007;69:1789-99.
[PubMed Abstract] -

6. Nightingale S, Ances B, Cinque P, et al. Cognitive impairment in people living with HIV: consensus recommendations for a new approach. Nat Rev Neurol. 2023;19:424-33.
[PubMed Abstract] -

7. Bing EG, Burnam MA, Longshore D, et al. Psychiatric disorders and drug use among human immunodeficiency virus-infected adults in the United States. Arch Gen Psychiatry. 2001;58:721-8.
[PubMed Abstract] -

8. Carvalhal A, Baril JG, Crouzat F, et al. Recognizing cognitive and psychiatric changes in the post-highly active antiretroviral therapy era. Can J Infect Dis Med Microbiol. 2012;23:209-15.
[PubMed Abstract] -

9. European AIDS Clinical Society. Guidelines. Version 8.0. October, 2015.
[EACS] -

10. Orlando M, Burnam MA, Beckman R, et al. Re-estimating the prevalence of psychiatric disorders in a nationally representative sample of persons receiving care for HIV: results from the HIV Cost and Services Utilization Study. Int J Methods Psychiatr Res. 2002;11:75-82.
[PubMed Abstract] -

11. Neigh GN, Rhodes ST, Valdez A, Jovanovic T. PTSD co-morbid with HIV: Separate but equal, or two parts of a whole? Neurobiol Dis. 2016;92:116-23.
[PubMed Abstract] -

12. Mudra Rakshasa-Loots A, Bakewell N, Sharp DJ, et al. Biomarkers of central and peripheral inflammation mediate the association between HIV and depressive symptoms. Transl Psychiatry. 2023;13:190.
[PubMed Abstract] -

13. Mudra Rakshasa-Loots A, Whalley HC, Vera JH, Cox SR. Neuroinflammation in HIV-associated depression: evidence and future perspectives. Mol Psychiatry. 2022;27:3619-32.

[PubMed Abstract] -

14. Centers for Disease Control and Prevention. Behavioral and Clinical Characteristics of Persons with Diagnosed HIV Infection—Medical Monitoring Project, United States, 2023 Cycle (June 2023–May 2024). Published March 16, 2026.
[CDC] -

15. Machtinger EL, Wilson TC, Haberer JE, Weiss DS. Psychological trauma and PTSD in HIV-positive women: a meta-analysis. AIDS Behav. 2012;16:2091-100.
[PubMed Abstract] -

16. Buckingham E, Schrage E, Cournos F. Why the Treatment of Mental Disorders Is an Important Component of HIV Prevention among People Who Inject Drugs. Adv Prev Med. 2013;2013:690386.
[PubMed Abstract] -

17. Cohen MS, Chen YQ, McCauley M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. N Engl J Med. 2011;365:493-505.
[PubMed Abstract] -

18. Willie TC, Overstreet NM, Sullivan TP, Sikkema KJ, Hansen NB. Barriers to HIV Medication Adherence: Examining Distinct Anxiety and Depression Symptoms among Women Living with HIV Who Experienced Childhood Sexual Abuse. Behav Med. 2016;42:120-7.
[PubMed Abstract] -

19. Gonzalez JS, Batchelder AW, Psaros C, Safren SA. Depression and HIV/AIDS treatment nonadherence: a review and meta-analysis. J Acquir Immune Defic Syndr. 2011;58:181-7.
[PubMed Abstract] -

20. Mitzel LD, Vanable PA, Brown JL, Bostwick RA, Sweeney SM, Carey MP. Depressive Symptoms Mediate the Effect of HIV-Related Stigmatization on Medication Adherence Among HIV-Infected Men Who Have Sex with Men. AIDS Behav. 2015;19:1454-9.
[PubMed Abstract] -

21. Meade CS, Bevilacqua LA, Key MD. Bipolar disorder is associated with HIV transmission risk behavior among patients in treatment for HIV. AIDS Behav. 2012;16:2267-71.
[PubMed Abstract] -

22. O'Cleirigh C, Newcomb ME, Mayer KH, Skeer M, Traeger L, Safren SA. Moderate levels of depression predict sexual transmission risk in HIV-infected MSM: a longitudinal analysis of data from six sites involved in a "prevention for positives" study. AIDS Behav. 2013;17:1764-9.
[PubMed Abstract] -

23. Moore DJ, Posada C, Parikh M, et al. HIV-infected individuals with co-occurring bipolar disorder evidence poor antiretroviral and psychiatric medication adherence. AIDS Behav. 2012;16:2257-66.
[PubMed Abstract] -

24. Walkup J, Blank MB, Gonzalez JS, et al. The impact of mental health and substance abuse factors on HIV prevention and treatment. J Acquir Immune Defic Syndr. 2008;47 Suppl 1:S15-9.
[PubMed Abstract] -

25. Sikkema KJ, Watt MH, Drabkin AS, Meade CS, Hansen NB, Pence BW. Mental health treatment to reduce HIV transmission risk behavior: a positive prevention model. AIDS Behav. 2010;14:252-62.
[PubMed Abstract] -

26. Grossman CI, Gordon CM. Mental health considerations in secondary HIV prevention. AIDS Behav. 2010;14:263-71.
[PubMed Abstract] -

27. Treisman G, Angelino A. Interrelation between psychiatric disorders and the prevention and treatment of HIV infection. Clin Infect Dis. 2007;45 Suppl 4:S313-7.
[PubMed Abstract] -

28. Badiee J, Riggs PK, Rooney AS, et al. Approaches to identifying appropriate medication adherence assessments for HIV infected individuals with comorbid bipolar disorder. AIDS Patient Care STDS. 2012;26:388-94.
[PubMed Abstract] -

29. Vranceanu AM, Safren SA, Lu M, et al. The relationship of post-traumatic stress disorder and depression to antiretroviral medication adherence in persons with HIV. AIDS Patient Care STDS. 2008;22:313-21.
[PubMed Abstract] -

30. Brownley JR, Fallot RD, Wolfson Berley R, Himelhoch SS. Trauma history in African-American women living with HIV: effects on psychiatric symptom severity and religious coping. AIDS Care. 2015;27:964-71.
[PubMed Abstract] -

31. Yiaslas TA, Kamen C, Arteaga A, et al. The relationship between sexual trauma, peritraumatic dissociation, posttraumatic stress disorder, and HIV-related health in HIV-positive men. J Trauma Dissociation. 2014;15:420-35.
[PubMed Abstract] -

32. Antelman G, Kaaya S, Wei R, et al. Depressive symptoms increase risk of HIV disease progression and mortality among women in Tanzania. J Acquir Immune Defic Syndr. 2007;44:470-7.
[PubMed Abstract] -

33. Charlson FJ, Baxter AJ, Dua T, Degenhardt L, Whiteford HA, Vos T. Excess mortality from mental, neurological and substance use disorders in the Global Burden of Disease Study 2010. Epidemiol Psychiatr Sci. 2015;24:121-40.
[PubMed Abstract] -

34. Sundermann EE, Tang B, Kim M, Paolillo EW, Heaton RK, Moore RC. Neuropsychiatric predictors of cognitive functioning over a one-year follow-up period in HIV. J Affect Disord. 2023;336:92-6.
[PubMed Abstract] -

35. Goodkin K, Evering TH, Anderson AM, et al. The comorbidity of depression and neurocognitive disorder in persons with HIV infection: call for investigation and treatment. Front Cell Neurosci. 2023;17:1130938.
[PubMed Abstract] -

36. Cruess DG, Kalichman SC, Amaral C, Swetzes C, Cherry C, Kalichman MO. Benefits of adherence to psychotropic medications on depressive symptoms and antiretroviral medication adherence among men and women living with HIV/AIDS. Ann Behav Med. 2012;43:189-97.
[PubMed Abstract] -

37. Saylor D, Dickens AM, Sacktor N, et al. HIV-associated neurocognitive disorder - pathogenesis and prospects for treatment. Nat Rev Neurol. 2016;12:309.
[PubMed Abstract] -

38. Prince M, Bryce R, Albanese E, Wimo A, Ribeiro W, Ferri CP. The global prevalence of dementia: a systematic review and metaanalysis. Alzheimers Dement. 2013;9:63-75.e2.
[PubMed Abstract] -

39. Heaton RK, Clifford DB, Franklin DR Jr, et al. HIV-associated neurocognitive disorders persist in the era of potent antiretroviral therapy: CHARTER Study. Neurology. 2010;75:2087-96.
[PubMed Abstract] -

40. Vance DE, Wadley VG, Crowe MG, Raper JL, Ball KK. Cognitive and Everyday Functioning in Older and Younger Adults with and without HIV. Clin Gerontol. 2011;34:413-426.
[PubMed Abstract] -

41. Sacktor N, Skolasky RL, Seaberg E, et al. Prevalence of HIV-associated neurocognitive disorders in the Multicenter AIDS Cohort Study. Neurology. 2016;86:334-40.
[PubMed Abstract] -

42. Eggers C, Arendt G, Hahn K, et al. HIV-1-associated neurocognitive disorder: epidemiology, pathogenesis, diagnosis, and treatment. J Neurol. 2017;264:1715-27.
[PubMed Abstract] -

43. The HIV and Aging Consensus Project: Recommended Treatment Strategies for Clinicians Managing Older Patients with HIV. American Academy of HIV Medicine. Last Updated May 2017
[AAHIVM] -

44. Ahern E, Semkovska M. Cognitive functioning in the first-episode of major depressive disorder: A systematic review and meta-analysis. Neuropsychology. 2017;31:52-72.
[PubMed Abstract] -

45. Roca M, Vives M, López-Navarro E, García-Campayo J, Gili M. Cognitive impairments and depression: a critical review. Actas Esp Psiquiatr. 2015;43:187-93.
[PubMed Abstract] -

46. Letendre SL, Chen H, McKhann A, et al. Antiretroviral Therapy Intensification for Neurocognitive Impairment in HIV. Clin Infect Dis. 2023 May 15. [Online ahead of print]
[PubMed Abstract] -

47. Gutiérrez F, Navarro A, Padilla S, et al. Prediction of neuropsychiatric adverse events associated with long-term efavirenz therapy, using plasma drug level monitoring. Clin Infect Dis. 2005;41:1648-53.
[PubMed Abstract] -

48. Foster R, Taylor C, Everall IP. More on abacavir-induced neuropsychiatric reactions. AIDS. 2004;18:2449.
[PubMed Abstract] -

49. Foster R, Olajide D, Everall IP. Antiretroviral therapy-induced psychosis: case report and brief review of the literature. HIV Med. 2003;4:139-44.
[PubMed Abstract] -

50. Boly L, Cafaro V, Dyner T. Depressive symptoms predict increased incidence of neuropsychiatric side effects in patients treated with efavirenz. J Acquir Immune Defic Syndr. 2006;42:514-5.
[PubMed Abstract] -

51. Fuchs CH, Haradhvala N, Hubley S, et al. Physician actions following a positive PHQ-2: implications for

the implementation of depression screening in family medicine practice. Fam Syst Health. 2015;33:18-27.
[PubMed Abstract] -

52. Yonkers KA, Smith MV, Lin H, Howell HB, Shao L, Rosenheck RA. Depression screening of perinatal women: an evaluation of the healthy start depression initiative. Psychiatr Serv. 2009;60:322-8.
[PubMed Abstract] -

53. Katon WJ, Lin EH, Von Korff M, et al. Collaborative care for patients with depression and chronic illnesses. N Engl J Med. 2010;363:2611-20.
[PubMed Abstract] -

54. Croft P, Altman DG, Deeks JJ, et al. The science of clinical practice: disease diagnosis or patient prognosis? Evidence about "what is likely to happen" should shape clinical practice. BMC Med. 2015;13:20.
[PubMed Abstract] -

55. US Preventive Services Task Force, Barry MJ, Nicholson WK, et al. Screening for Depression and Suicide Risk in Adults: US Preventive Services Task Force Recommendation Statement. JAMA. 2023;329:2057-67.
[PubMed Abstract] -

56. Horberg M, Thompson M, Agwu A, et al. Primary Care Guidance for Providers of Care for Persons With Human Immunodeficiency Virus: 2024 Update by the HIV Medicine Association of the Infectious Diseases Society of America. Clin Infect Dis. 2024 Oct 12:ciae479.
[PubMed Abstract] -

57. Tamburrino MB, Lynch DJ, Nagel RW, Smith MK. Primary care evaluation of mental disorders (PRIME-MD) screening for minor depressive disorder in primary care. Prim Care Companion J Clin Psychiatry. 2009;11:339-43.
[PubMed Abstract] -

58. Whooley MA, Avins AL, Miranda J, Browner WS. Case-finding instruments for depression. Two questions are as good as many. J Gen Intern Med. 1997;12:439-45.
[PubMed Abstract] -

59. Preljevic VT, Østhus TB, Sandvik L, et al. Screening for anxiety and depression in dialysis patients: comparison of the Hospital Anxiety and Depression Scale and the Beck Depression Inventory. J Psychosom Res. 2012;73:139-44.
[PubMed Abstract] -

60. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001;16:606-13.
[PubMed Abstract] -

61. Huang FY, Chung H, Kroenke K, Delucchi KL, Spitzer RL. Using the Patient Health Questionnaire-9 to measure depression among racially and ethnically diverse primary care patients. J Gen Intern Med. 2006;21:547-52.
[PubMed Abstract] -

62. Moriarty AS, Gilbody S, McMillan D, Manea L. Screening and case finding for major depressive disorder using the Patient Health Questionnaire (PHQ-9): a meta-analysis. Gen Hosp Psychiatry. 2015;37:567-76.
[PubMed Abstract] -

63. Maurer DM. Screening for depression. Am Fam Physician. 2012;85:139-44.
[PubMed Abstract] -

64. Levis B, Benedetti A, Ioannidis JPA, et al. Patient Health Questionnaire-9 scores do not accurately estimate depression prevalence: individual participant data meta-analysis. J Clin Epidemiol. 2020;122:115-128.e1.
[PubMed Abstract] -

65. Chang BP, Tan TM. Suicide screening tools and their association with near-term adverse events in the ED. Am J Emerg Med. 2015;33:1680-3.
[PubMed Abstract] -

66. Kroenke K, Spitzer RL, Williams JB. The Patient Health Questionnaire-2: validity of a two-item depression screener. Med Care. 2003;41:1284-92.
[PubMed Abstract] -

67. Levis B, Sun Y, He C, et al. Accuracy of the PHQ-2 Alone and in Combination With the PHQ-9 for Screening to Detect Major Depression: Systematic Review and Meta-analysis. JAMA. 2020;323:2290-2300.
[PubMed Abstract] -

68. Herr NR, Williams JW Jr, Benjamin S, McDuffie J. Does this patient have generalized anxiety or panic disorder?: The Rational Clinical Examination systematic review. JAMA. 2014;312:78-84.
[PubMed Abstract] -

69. US Preventive Services Task Force, Barry MJ, Nicholson WK, et al. Screening for Anxiety Disorders in Adults: US Preventive Services Task Force Recommendation Statement. JAMA. 2023 Jun 20. Online ahead of print.
[PubMed Abstract] -

70. Kroenke K, Spitzer RL, Williams JB, Monahan PO, Löwe B. Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. Ann Intern Med. 2007;146:317-25.
[PubMed Abstract] -

71. Löwe B, Decker O, Müller S, et al. Validation and standardization of the Generalized Anxiety Disorder Screener (GAD-7) in the general population. Med Care. 2008;46:266-74.
[PubMed Abstract] -

72. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch Intern Med. 2006;166:1092-7.
[PubMed Abstract] -

73. Plummer F, Manea L, Trepel D, McMillan D. Screening for anxiety disorders with the GAD-7 and GAD-2: a systematic review and diagnostic metaanalysis. Gen Hosp Psychiatry. 2016;39:24-31.
[PubMed Abstract] -

74. Aktürk Z, Hapfelmeier A, Fomenko A, et al. Generalized Anxiety Disorder 7-item (GAD-7) and 2-item (GAD-2) scales for detecting anxiety disorders in adults. Cochrane Database Syst Rev. 2025;3:CD015455.
[PubMed Abstract] -

75. O'Connor EA, Henninger ML, Perdue LA, Coppola EL, Thomas RG, Gaynes BN. Anxiety Screening: Evidence Report and Systematic Review for the US Preventive Services Task Force. JAMA.

2023;329:2171-84.
[PubMed Abstract] -

76. Wittkampf KA, Baas KD, van Weert HC, Lucassen P, Schene AH. The psychometric properties of the panic disorder module of the Patient Health Questionnaire (PHQ-PD) in high-risk groups in primary care. J Affect Disord. 2011;130:260-7.
[PubMed Abstract] -

77. Spoont MR, Williams JW Jr, Kehle-Forbes S, Nieuwsma JA, Mann-Wrobel MC, Gross R. Does This Patient Have Posttraumatic Stress Disorder?: Rational Clinical Examination Systematic Review. JAMA. 2015;314:501-10.
[PubMed Abstract] -

78. Freedy JR, Steenkamp MM, Magruder KM, et al. Post-traumatic stress disorder screening test performance in civilian primary care. Fam Pract. 2010;27:615-24.
[PubMed Abstract] -

79. Prins A, Bovin MJ, Smolenski DJ, et al. The Primary Care PTSD Screen for DSM-5 (PC-PTSD-5): Development and Evaluation Within a Veteran Primary Care Sample. J Gen Intern Med. 2016;31:1206-11.
[PubMed Abstract] -

80. Ouimette P, Wade M, Prins A, Schohn M. Identifying PTSD in primary care: comparison of the Primary Care-PTSD screen (PC-PTSD) and the General Health Questionnaire-12 (GHQ). J Anxiety Disord. 2008;22:337-43.
[PubMed Abstract] -

81. Das AK, Olfson M, Gameroff MJ, et al. Screening for bipolar disorder in a primary care practice. JAMA. 2005;293:956-63.
[PubMed Abstract] -

82. Merikangas KR, Akiskal HS, Angst J, et al. Lifetime and 12-month prevalence of bipolar spectrum disorder in the National Comorbidity Survey replication. Arch Gen Psychiatry. 2007;64:543-52.
[PubMed Abstract] -

83. Carvalho AF, Takwoingi Y, Sales PM, et al. Screening for bipolar spectrum disorders: A comprehensive meta-analysis of accuracy studies. J Affect Disord. 2015;172:337-46.
[PubMed Abstract] -

84. Hirschfeld RM, Williams JB, Spitzer RL, et al. Development and validation of a screening instrument for bipolar spectrum disorder: the Mood Disorder Questionnaire. Am J Psychiatry. 2000;157:1873-5.
[PubMed Abstract] -

85. Price AL, Marzani-Nissen GR. Bipolar disorders: a review. Am Fam Physician. 2012;85:483-93.
[PubMed Abstract] -

86. Zimmerman M, Galione JN. Screening for bipolar disorder with the Mood Disorders Questionnaire: a review. Harv Rev Psychiatry. 2011;19:219-28.
[PubMed Abstract] -

87. Owens DK, Davidson KW, Krist AH, et al. Screening for Cognitive Impairment in Older Adults: US Preventive Services Task Force Recommendation Statement. JAMA. 2020;323:757-63.
[PubMed Abstract] -

88. Mind Exchange Working Group. Assessment, diagnosis, and treatment of HIV-associated neurocognitive disorder: a consensus report of the mind exchange program. Clin Infect Dis. 2013;56:1004-17.
[PubMed Abstract] -

89. Ebell MH. Brief screening instruments for dementia in primary care. Am Fam Physician. 2009;79:497-8, 500.
[PubMed Abstract] -

90. Michels TC, Tiu AY, Graver CJ. Neuropsychological evaluation in primary care. Am Fam Physician. 2010;82:495-502.
[PubMed Abstract] -

91. Petersen RC, Stevens JC, Ganguli M, Tangalos EG, Cummings JL, DeKosky ST. Practice parameter: early detection of dementia: mild cognitive impairment (an evidence-based review). Report of the Quality Standards Subcommittee of the American Academy of Neurology. Neurology. 2001;56:1133-42.
[PubMed Abstract] -

92. Folstein MF, Folstein SE, McHugh PR. "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res. 1975;12:189-98.
[PubMed Abstract] -

93. Tombaugh TN, McIntyre NJ. The mini-mental state examination: a comprehensive review. J Am Geriatr Soc. 1992;40:922-35.
[PubMed Abstract] -

94. Nakazato A, Tominaga D, Tasato D, et al. Are MMSE and HDS-R neuropsychological tests adequate for screening HIV-associated neurocognitive disorders? J Infect Chemother. 2014;20:217-9.
[PubMed Abstract] -

95. Skinner S, Adewale AJ, DeBlock L, Gill MJ, Power C. Neurocognitive screening tools in HIV/AIDS: comparative performance among patients exposed to antiretroviral therapy. HIV Med. 2009;10:246-52.
[PubMed Abstract] -

96. Borson S, Scanlan J, Brush M, Vitaliano P, Dokmak A. The mini-cog: a cognitive 'vital signs' measure for dementia screening in multi-lingual elderly. Int J Geriatr Psychiatry. 2000;15:1021-7.
[PubMed Abstract] -

97. Holsinger T, Plassman BL, Stechuchak KM, Burke JR, Coffman CJ, Williams JW Jr. Screening for cognitive impairment: comparing the performance of four instruments in primary care. J Am Geriatr Soc. 2012;60:1027-36.
[PubMed Abstract] -

98. Buschke H, Kuslansky G, Katz M, et al. Screening for dementia with the memory impairment screen. Neurology. 1999;52:231-8.
[PubMed Abstract] -

99. Janssen MA, Bosch M, Koopmans PP, Kessels RP. Validity of the Montreal Cognitive Assessment and the HIV Dementia Scale in the assessment of cognitive impairment in HIV-1 infected patients. J Neurovirol. 2015;21:383-90.
[PubMed Abstract] -

100. Nasreddine ZS, Phillips NA, Bédirian V, et al. The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. J Am Geriatr Soc. 2005;53:695-9.
[PubMed Abstract] -

101. Naqvi RM, Haider S, Tomlinson G, Alibhai S. Cognitive assessments in multicultural populations using the Rowland Universal Dementia Assessment Scale: a systematic review and meta-analysis. CMAJ. 2015;187:E169-75.
[PubMed Abstract] -

102. Nielsen TR, Jørgensen K. Cross-cultural dementia screening using the Rowland Universal Dementia Assessment Scale: a systematic review and meta-analysis. Int Psychogeriatr. 2020;32:1031-44.
[PubMed Abstract] -

103. Power C, Selnes OA, Grim JA, McArthur JC. HIV Dementia Scale: a rapid screening test. J Acquir Immune Defic Syndr Hum Retrovirol. 1995;8:273-8.
[PubMed Abstract] -

104. Valcour V, Paul R, Chiao S, Wendelken LA, Miller B. Screening for cognitive impairment in human immunodeficiency virus. Clin Infect Dis. 2011;53:836-42.
[PubMed Abstract] -

105. Zipursky AR, Gogolishvili D, Rueda S, et al. Evaluation of brief screening tools for neurocognitive impairment in HIV/AIDS: a systematic review of the literature. AIDS. 2013;27:2385-401.
[PubMed Abstract] -

106. Davis HF, Skolasky RL Jr, Selnes OA, Burgess DM, McArthur JC. Assessing HIV-associated dementia: modified HIV dementia scale versus the Grooved Pegboard. AIDS Read. 2002;12:29-31, 38.
[PubMed Abstract] -

107. Haddow LJ, Floyd S, Copas A, Gilson RJ. A systematic review of the screening accuracy of the HIV Dementia Scale and International HIV Dementia Scale. PLoS One. 2013;8:e61826.
[PubMed Abstract] -

108. Sacktor NC, Wong M, Nakasujja N, et al. The International HIV Dementia Scale: a new rapid screening test for HIV dementia. AIDS. 2005;19:1367-74.
[PubMed Abstract] -

109. Siu AL. Behavioral and Pharmacotherapy Interventions for Tobacco Smoking Cessation in Adults, Including Pregnant Women: U.S. Preventive Services Task Force Recommendation Statement. Ann Intern Med. 2015;163:622-34.
[PubMed Abstract] -

110. Pence BW, O'Donnell JK, Gaynes BN. Falling through the cracks: the gaps between depression prevalence, diagnosis, treatment, and response in HIV care. AIDS. 2012;26:656-8.
[PubMed Abstract] -

111. Torian LV, Wiewel EW, Liu KL, Sackoff JE, Frieden TR. Risk factors for delayed initiation of medical care after diagnosis of human immunodeficiency virus. Arch Intern Med. 2008;168:1181-7.
[PubMed Abstract] -

112. Willenbring ML. Integrating care for patients with infectious, psychiatric, and substance use disorders: concepts and approaches. AIDS. 2005;19 Suppl 3:S227-37.
[PubMed Abstract] -

113. Pence BW, Gaynes BN, Adams JL, et al. The effect of antidepressant treatment on HIV and depression outcomes: results from a randomized trial. AIDS. 2015;29:1975-86.
[PubMed Abstract] -

References

- Beer L, Tie Y, Padilla M, Shouse RL. Generalized anxiety disorder symptoms among persons with diagnosed HIV in the United States. AIDS. 2019;33:1781-87.
[PubMed Abstract] -

- Cook JA, Cohen MH, Burke J, et al. Effects of depressive symptoms and mental health quality of life on use of highly active antiretroviral therapy among HIV-seropositive women. J Acquir Immune Defic Syndr. 2002;30:401-9.
[PubMed Abstract] -

- Cournos F, Empfield M, Horwath E, et al. HIV seroprevalence among patients admitted to two psychiatric hospitals. Am J Psychiatry. 1991;148:1225-30.
[PubMed Abstract] -

- Cournos F, Horwath E, Guido JR, McKinnon K, Hopkins N. HIV-1 infection at two public psychiatric hospitals in New York City. AIDS Care. 1994;6:443-52.
[PubMed Abstract] -

- Heslin M, Jewell A, Croxford S, et al. Prevalence of HIV in mental health service users: a retrospective cohort study. BMJ Open. 2023;13:e067337.
[PubMed Abstract] -

- Horberg MA, Silverberg MJ, Hurley LB, et al. Effects of depression and selective serotonin reuptake inhibitor use on adherence to highly active antiretroviral therapy and on clinical outcomes in HIV-infected patients. J Acquir Immune Defic Syndr. 2008;47:384-90.
[PubMed Abstract] -

- Hughes E, Bassi S, Gilbody S, Bland M, Martin F. Prevalence of HIV, hepatitis B, and hepatitis C in people with severe mental illness: a systematic review and meta-analysis. Lancet Psychiatry. 2016;3:40-8.
[PubMed Abstract] -

- Lu H, Surkan PJ, Irwin MR, et al. Inflammation and Risk of Depression in HIV: Prospective Findings From the Multicenter AIDS Cohort Study. Am J Epidemiol. 2019;188:1994-2003.
[PubMed Abstract] -

- Mimiaga MJ, Reisner SL, Grasso C, et al. Substance use among HIV-infected patients engaged in primary care in the United States: findings from the Centers for AIDS Research Network of Integrated Clinical Systems cohort. Am J Public Health. 2013;103:1457-67.
[PubMed Abstract] -

- Mitchell AJ, Yadegarfar M, Gill J, Stubbs B. Case finding and screening clinical utility of the Patient Health Questionnaire (PHQ-9 and PHQ-2) for depression in primary care: a diagnostic meta-analysis of 40 studies. BJPsych Open. 2016;2:127-138.
[PubMed Abstract] -

- Moore CL, Grulich AE, Prestage G, et al. Hospitalization for Anxiety and Mood Disorders in HIV-Infected and -Uninfected Gay and Bisexual Men. J Acquir Immune Defic Syndr. 2016;73:589-597.

[PubMed Abstract] -

- Nel A, Kagee A. Common mental health problems and antiretroviral therapy adherence. AIDS Care. 2011;23:1360-5.
[PubMed Abstract] -

- Saag LA, Tamhane AR, Batey DS, Mugavero MJ, Eaton EF. Mental health service utilization is associated with retention in care among persons living with HIV at a university-affiliated HIV clinic. AIDS Res Ther. 2018;15:1.
[PubMed Abstract] -

- Siu AL, Bibbins-Domingo K, Grossman DC, et al. Screening for Depression in Adults: US Preventive Services Task Force Recommendation Statement. JAMA. 2016;315:380-7.
[PubMed Abstract] -

- Spitzer RL, Kroenke K, Williams JB. Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. Primary Care Evaluation of Mental Disorders. Patient Health Questionnaire. JAMA. 1999;282:1737-44.
[PubMed Abstract] -

- Underwood J, Winston A. Guidelines for Evaluation and Management of Cognitive Disorders in HIV-Positive Individuals. Curr HIV/AIDS Rep. 2016;13:235-40.
[PubMed Abstract] -

Figures

Figure 1 Depression in Persons with HIV During the 2 Weeks Before Interview—Medical Monitoring Project, United States, 2023 Cycle

Using the DSM-IV criteria, major depression was defined as having at least 5 symptoms of depression and other depression was defined as having 2–4 symptoms of depression.

Source: Centers for Disease Control and Prevention. Behavioral and Clinical Characteristics of Persons with Diagnosed HIV Infection—Medical Monitoring Project, United States, 2023 Cycle (June 2023–May 2024). Published March 16, 2026.

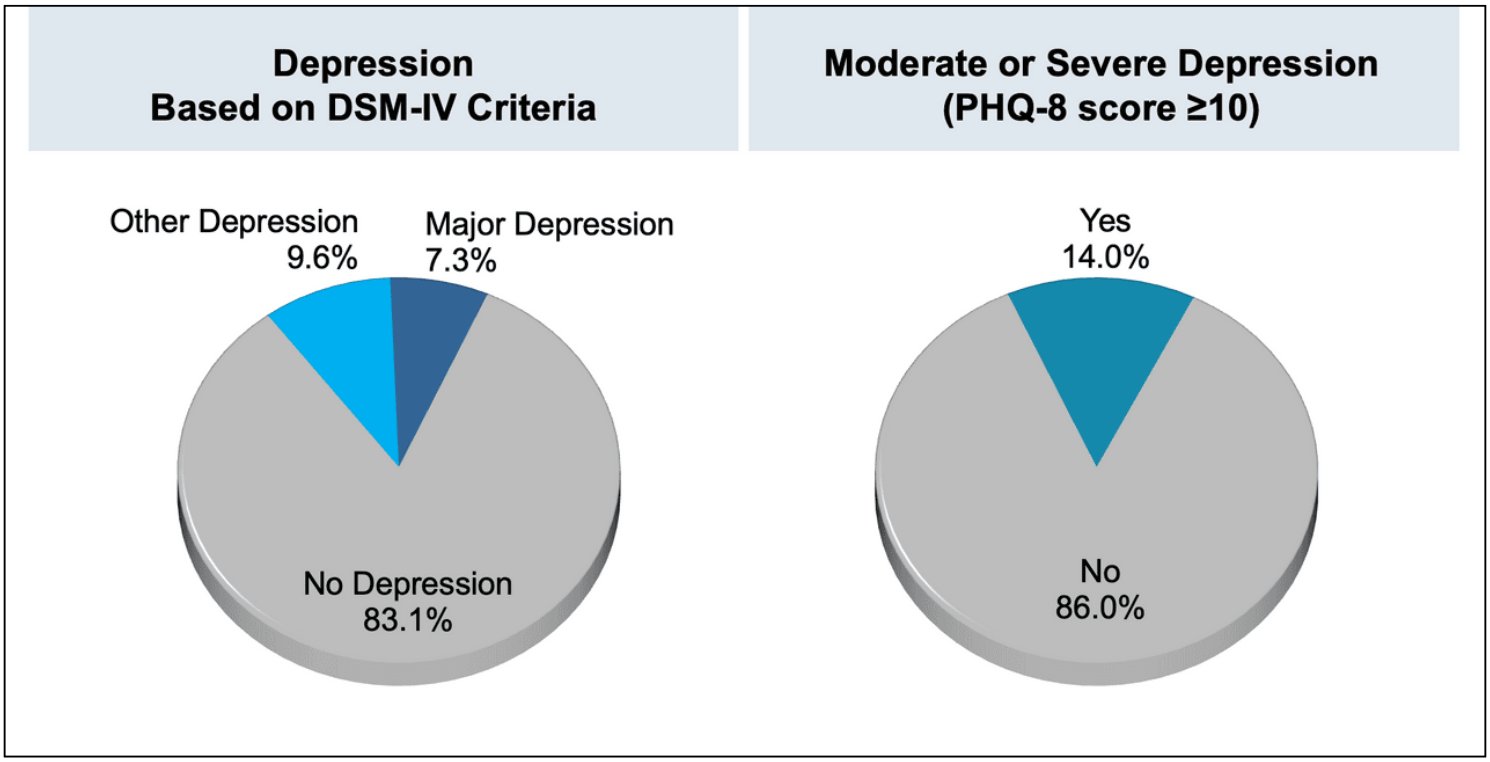


Figure 2 Anxiety in Persons with HIV During the 2 Weeks Before Interview—Medical Monitoring Project, United States, 2023 Cycle

Anxiety definitions were according to criteria from the DSM-IV and based on GAD-7 scores. Severe anxiety was defined as having a score of ≥15, moderate anxiety as having a score of 10–14, and mild anxiety as having a score of 5–9.

Source: Centers for Disease Control and Prevention. Behavioral and Clinical Characteristics of Persons with Diagnosed HIV Infection—Medical Monitoring Project, United States, 2023 Cycle (June 2023–May 2024). Published March 16, 2026.

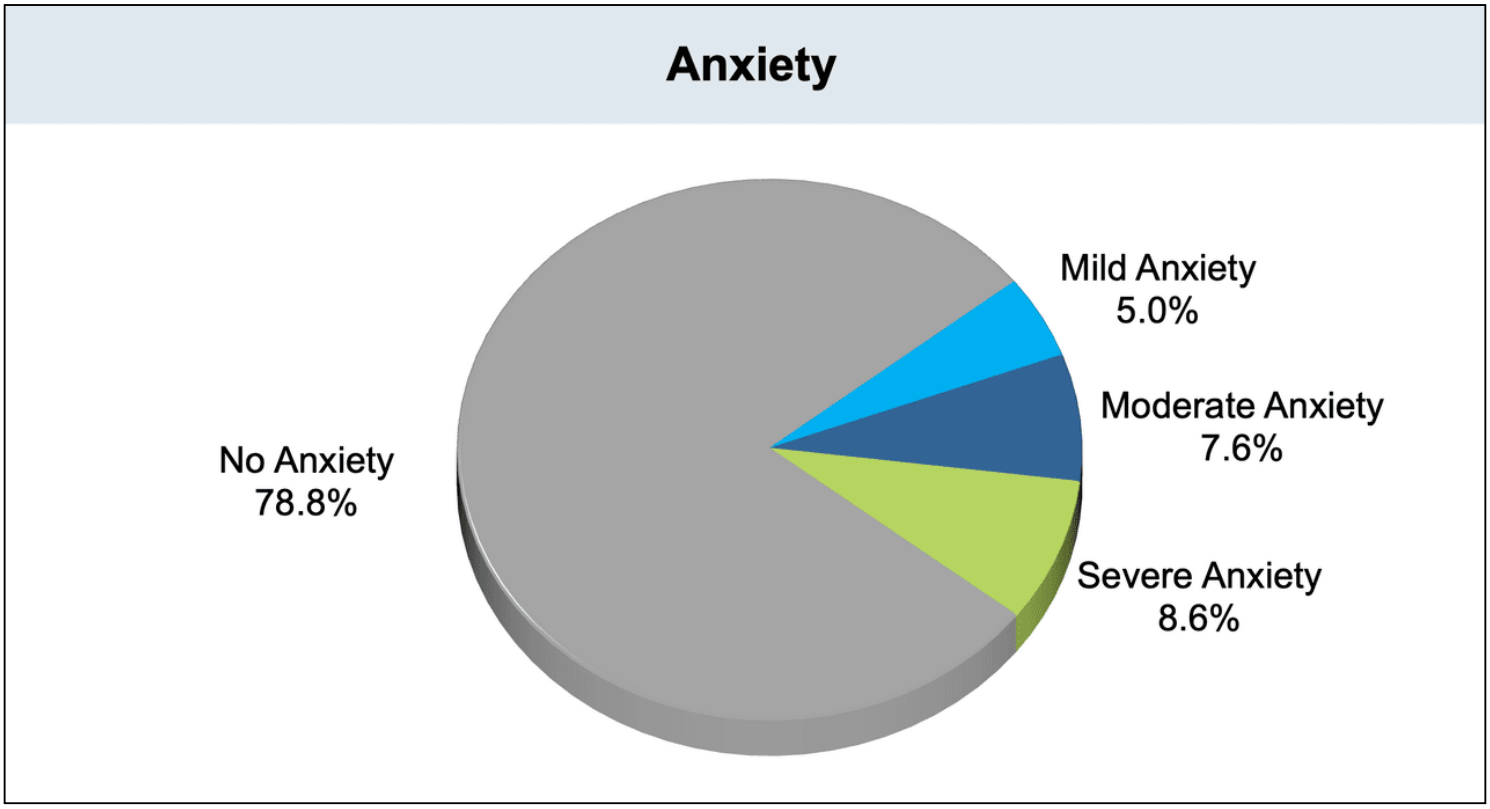


Figure 3 Positive Prevention Model Showing Hypothesized Effects of Mental Health Treatment on HIV Transmission Risk Behavior

Source: Sikkema KJ, Watt MH, Drabkin AS, Meade CS, Hansen NB, Pence BW. Mental health treatment to reduce HIV transmission risk behavior: a positive prevention model. AIDS Behav. 2010;14:252-62.

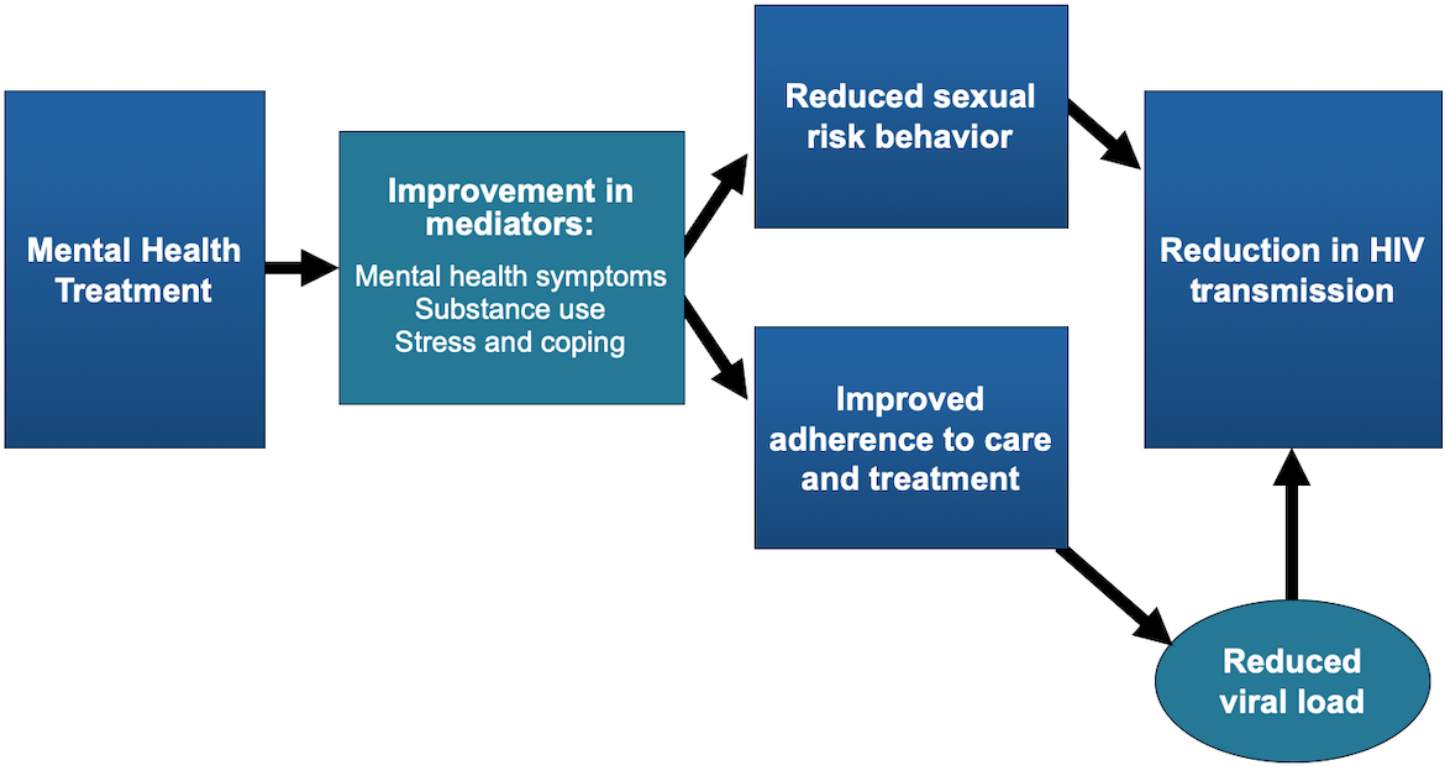


Figure 4 PHQ-9 Scores and Likelihood Ratio for Major Depression

These data are based on surveys from 580 patients who completed the PHQ-9 and had a structured interview by a mental health professional to determine the presence or absence of major depression.

Source: Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001;16:606-13.

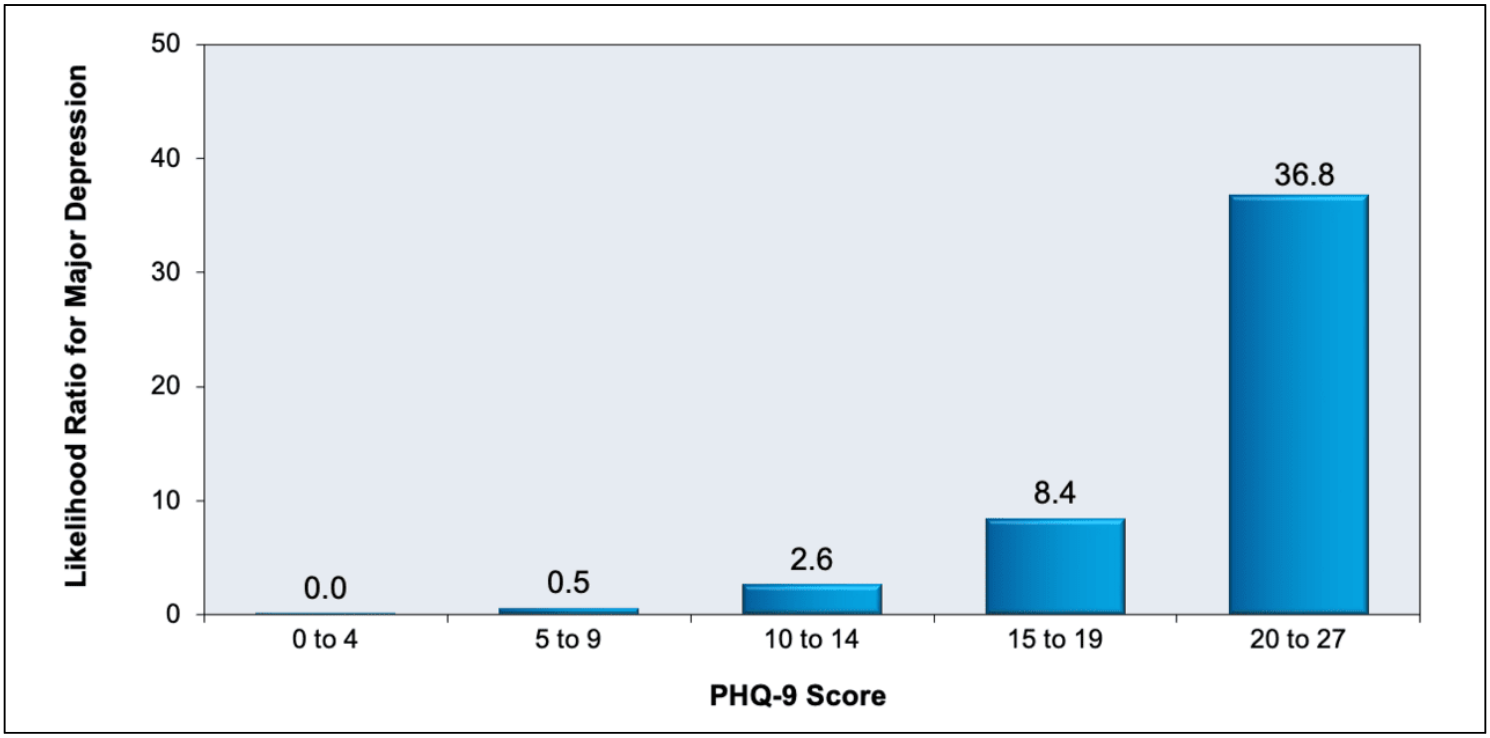


Figure 5 Operating Characteristics of PHQ-2 for Major Depression

This table shows the sensitivity, specificity, positive predictive value, and likelihood ratios for the range of PHQ-2 scores in diagnosing major depressive disorder based on surveys from 580 individuals who completed the PHQ-2.

Source: Kroenke K, Spitzer RL, Williams JB. The Patient Health Questionnaire-2: Validity of a Two-Item Depression Screener. Medical Care. 2003;41:1284-92.

Operating Characteristics of PHQ-2 Screen for Major Depression

PHQ-2 Score	Sensitivity	Specificity	Positive Predictive Value	Likelihood Ratio
1	97.6	59.2	15.4	0.3
2	92.7	73.7	21.1	0.6
3	82.9	90.0	38.4	2.9
4	73.2	93.3	45.5	5.5
5	53.7	96.8	56.4	10.3
6	26.8	99.4	78.6	48.2

Figure 6 Operating Characteristics of GAD-7 for Generalized Anxiety Disorder

This table shows the sensitivity, specificity, and likelihood ratios for the GAD-7 scores in the range of 8 to 15 as a diagnosis for generalized anxiety disorder. These data are based on 995 patients who completed the GAD-7 and underwent structured psychiatric interviews by a mental health professional as an evaluation for generalized anxiety disorder.

Source: Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch Intern Med. 2006;166:1092-7.

Operating Characteristics of GAD-7 Screen for Generalized Anxiety Disorder

GAD-7 Score	Sensitivity	Specificity	Likelihood Ratio
8	92	76	3.8
9	90	79	4.3
10	89	82	5.1
11	82	85	5.5
12	73	89	6.5
13	66	91	7.7
14	56	92	7.2
15	48	95	8.7

Figure 7 Diagnostic Characteristics for the Primary Care PTSD Screen

These data are based on surveys from 399 adult Veterans seen at a primary clinic. The Primary Care PTSD Screen for DSM-5 (PC-PTSD-5) screening tool was used.

Source: Prins A, Bovin MJ, Smolenski DJ, et al. The Primary Care PTSD Screen for DSM-5 (PC-PTSD-5): Development and Evaluation Within a Veteran Primary Care Sample. J Gen Intern Med. 2016;31:1206-11.

Diagnostic Characteristics of the PC-PTSD-5 Screen by Cut-Off Score

Cut-off Score	Sensitivity	Specificity	Likelihood Ratio
0	-	-	-
1	99	67	2.99
2	98	78	4.41
3	95	85	6.33
4	83	91	8.79
5	56	97	17.40

Figure 8 Operating Characteristics of the Mood Disorder Questionnaire

This graphic is based on data from 198 individuals seen at five outpatient clinics. A score of 7 or higher (gray vertical line) was chosen as the optimal cutoff.

Source: Hirschfeld RM, Williams JB, Spitzer RL, et al. Development and validation of a screening instrument for bipolar spectrum disorder: the Mood Disorder Questionnaire. Am J Psychiatry. 2000;157:1873-5. Reprinted with permission from the American Journal of Psychiatry, (Copyright ©2000). American Psychiatric Association. All Rights Reserved.

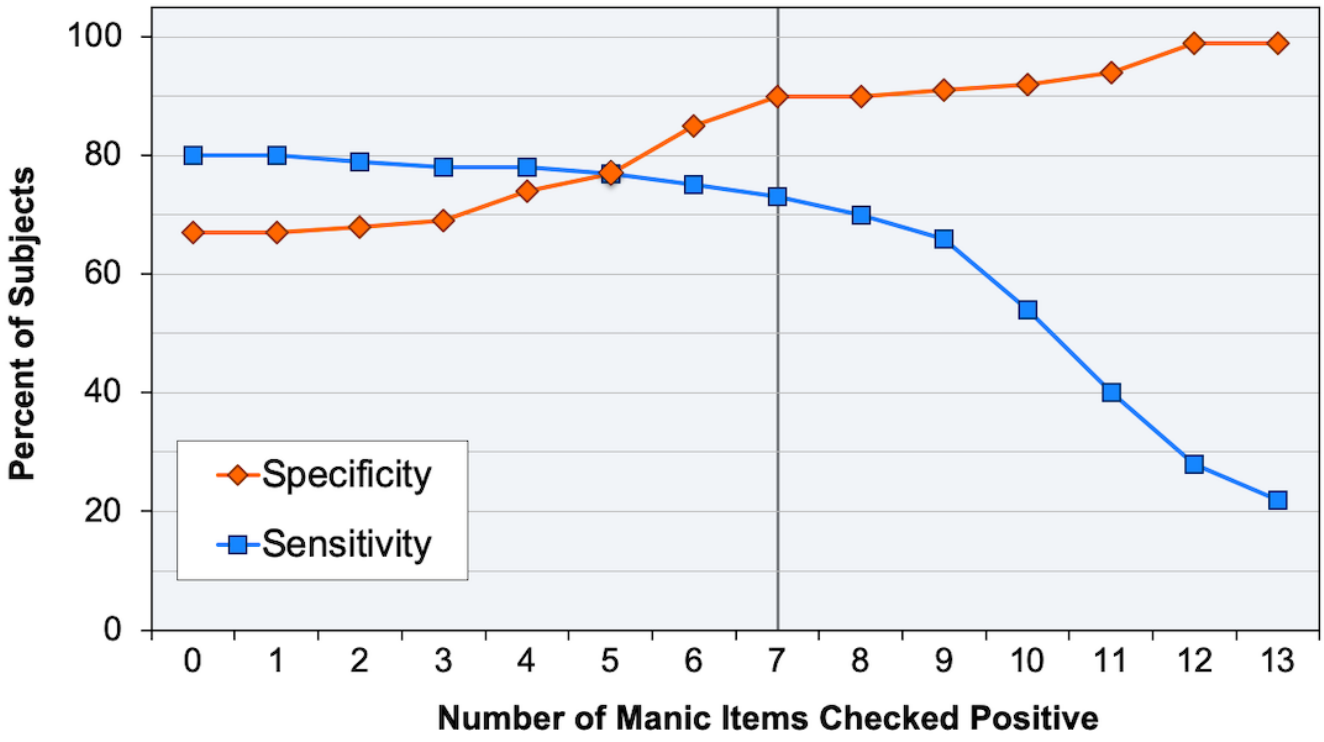


Figure 9 Depression Treatment Cascade for Patients with HIV

This graphic shows the estimated proportion of all HIV patients with a major depressive episode in the past year who had depression recognized clinically, received any treatment, received adequate treatment, and achieved remission.

Source: Pence BW, O'Donnell JK, Gaynes BN. Falling through the cracks: the gaps between depression prevalence, diagnosis, treatment, and response in HIV care. AIDS. 2012;26:656-8.

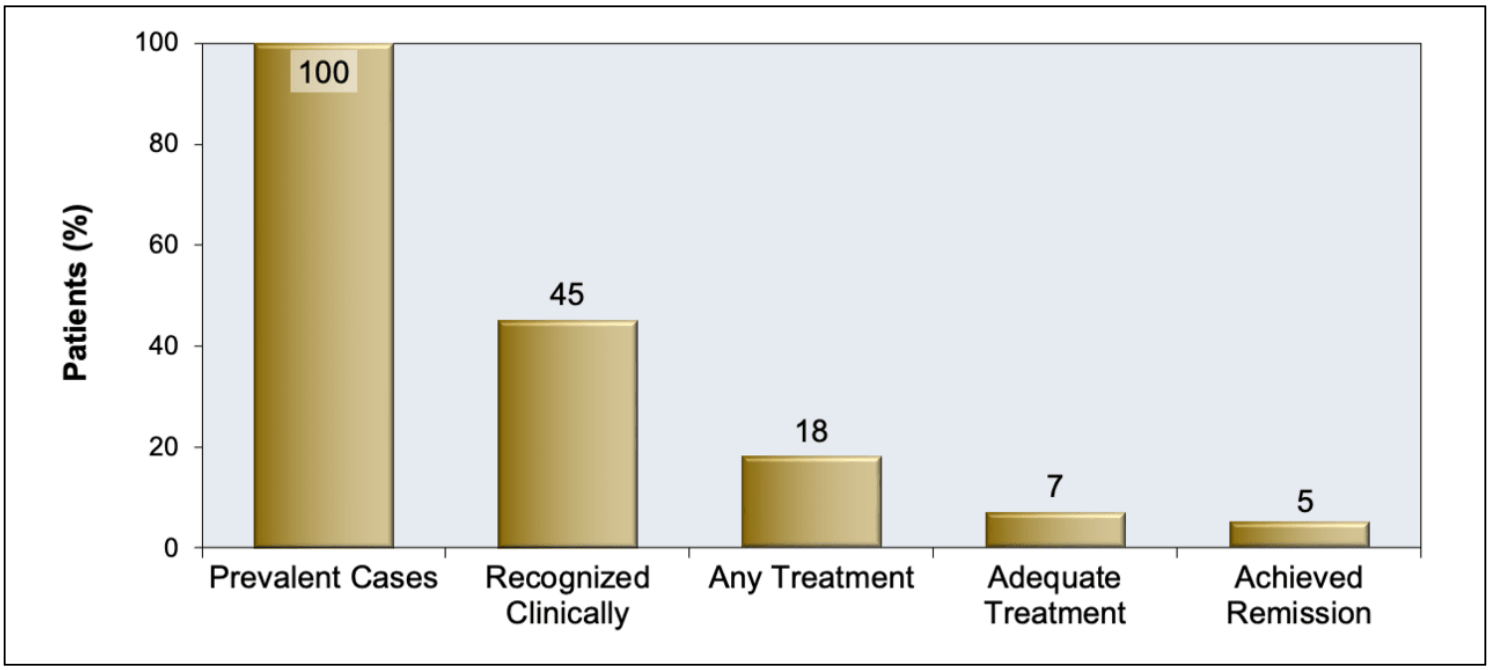


Table 1. Classification of HIV Neurocognitive Disorders*

Category	Diagnostic Criteria
Asymptomatic Neurocognitive Impairment (ANI)	• Impairment in ≥2 neurocognitive domains (≥1 SD) • Does not interfere with daily functioning
Mild Neurocognitive Disorder (MND)	• Impairment in ≥2 neurocognitive domains (≥1 SD) • Mild to moderate interference in daily functioning
HIV-Associated Dementia (HAD)	• Marked (≥2 SD) impairment in ≥2 neurocognitive d • Marked interference in daily functioning

*Adapted from: Antinori A, Arendt G, Becker JT, et al. Updated research nosology for HIV-associated neurocognitive Neurology. 2007;69:1789-99.
Abbreviations: SD = standard deviation

Source:

- Antinori A, Arendt G, Becker JT, et al. Updated research nosology for HIV-associated neurocognitive disorders. Neurology. 2007;69:1789-99. [PubMed Abstract]

Table 2. Recommendations from the International HIV-Cognition Working Group

Recommendation Number	Summary of Recommendation
1	HIV-associated brain injury (HABI) should be considered as one cause of cognitive im alongside other potential causes of brain injury occurring in people living with HIV.
2	HABI should be differentiated on the basis of HIV RNA suppression and the activity o
3	Low performance on cognitive tests should not be labeled as cognitive impairment w clinical context.
4	When interpreting cognitive data, the false-classification rate should be considered.
5	A research classification of cognitive impairment in people living with HIV should cor combination of cognitive symptoms, low performance on cognitive testing, and abnc neurological investigations.
6	Cognitive symptoms should refer to any change in cognition that has been noticed b individual or an observer, whether or not this change has an impact on daily functio

Source:

- Nightingale S, Ances B, Cinque P, et al. Cognitive impairment in people living with HIV: consensus recommendations for a new approach. Nat Rev Neurol. 2023;19:424-33. [PubMed Abstract]