Screening for Mental Health Conditions

Background

In the United States, people with HIV have a high prevalence of mental health conditions, often in conjunction with a substance use disorders.\(^1\) These co-morbidities, especially major depression and substance use disorders, are associated with potential changes in sex and injection drug-use practices, difficulty engaging in care along the entire HIV clinical care continuum, and problems with antiretroviral medication adherence. People with mental health conditions are also overrepresented among those who suffer from powerful social determinants of poor health, including poverty, homelessness, incarceration, discrimination, and stigma. Mental health conditions, especially with concomitant substance use disorders, can potentially shorten the lifespan of persons with HIV independent of adherence to HIV care and treatment.

Challenges in Evaluating Mental Health Conditions in Persons with HIV

Persons with HIV may also experience neurocognitive deficits. In particular, HIV-associated neuropsychiatric disorder (HAND) is an increasing concern for persons aging with HIV and HAND often complicates the care of older persons (and some younger persons) with HIV. The aging of people with HIV, and the neurocognitive problems associated with many of the comorbidities associated with HIV, such as substance use and chronic hepatitis C, contribute to the complexity of diagnosing and managing cognitive problems. Therefore, clinicians caring for individuals with HIV should be aware of the multitude of challenges implicit in the screening, diagnosis, and management of mental health conditions and neurocognitive deficits and should assist their patients in obtaining access to appropriate, integrated neuropsychiatric treatment.

Overview

This Topic Review will emphasize screening recommendations and tools for persons 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. Delirium in persons with HIV will not be addressed in this review. A detailed discussion of definitions, diagnostic criteria, and treatment for particular DSM-5 conditions is beyond the scope of this review. Screening tools for Alcohol/Substance Use Disorders are addressed in the topic Substance Use Disorders. It is, however, important to recognize that substance use disorders often coexist with mental health conditions, potentially complicating diagnosis and treatment.
Estimates of Mental Health Conditions in Person 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 among persons without HIV.[1,2,3,4,5]

- **HIV Cost and Services Utilization Survey (HCSUS):** This nationally representative, longitudinal survey enrolled 2,884 persons with HIV who were receiving medical care for HIV in the United States in 1996 and found that nearly of the 2,684 individuals participating in the survey screened positive for a psychiatric disorder.[2]

- **National Epidemiologic Survey on Alcohol and Related Conditions:** This national survey, which was conducted in the United States in 2004-2005, reported a 12-month prevalence of any mood disorder that was approximately 7-fold higher in men with HIV compared to men without HIV.[6]

- **Medical Monitoring Project 2018 Cycle:** This survey was conducted from June 2018 through May 2019 and it evaluated approximately 4,000 persons with HIV for the presence of depression during the 2-week period prior to the interview.[7] Using these criteria, 9.6% of persons with HIV had major depression based on DSMIV criteria and 14.5% had moderate or severe depression based on PHQ-8 score greater than 10 (Figure 1).[7] In this same report, 21.2% of persons with HIV reported anxiety, including 8.2% with severe anxiety (Figure 2).[7] The Medical Monitoring Project includes data only from persons with HIV who are receiving care and thus may not entirely reflect rates of depression in anxiety for all persons with HIV.[7]

- **PTSD Meta-Analysis in Women with HIV:** In a meta-analysis of published from the United States, a Western European country, Scandinavia, Australia, or New Zealand, investigators reported a PTSD rate of 30% among women with HIV, which is approximately five times higher than the prevalence reported among women without HIV infection).[8]
Mental Health Conditions and Risk of HIV Acquisition and Transmission

HIV Acquisition Risk

An extensive body of medical literature has documented an increased risk of HIV acquisition among individuals with mental health conditions, especially among women.[9,10] For example, bipolar disorder is associated with increased impulsivity, impaired judgment, risk-taking, substance use, and homelessness—all factors that may increase high-risk behaviors such as injection drug use, needle sharing, multiple partner sex, condomless sex, transactional sex, and sex under the influence of psychoactive substances.[11,12,13] Social impairments associated with severe mental illness also increase HIV acquisition risk by interfering with the ability of an individual to maintain healthy sexual relationships and to negotiate condom use with casual or anonymous partners.[14] The following studies, when taken together, strongly suggest that mental illness is associated with HIV acquisition.

- **NYC Psychiatric Inpatient Study (I):** In a study conducted from December 1989 through July 1990, HIV testing was performed on all persons admitted to an acute psychiatric unit in Manhattan and a large state hospital in Queens and investigators identified an HIV prevalence was 5.5% (25 of 451) and an HIV prevalence of 11.1% among black individuals.[15]

- **NYC Psychiatric Inpatient HIV Prevalence Study (II):** A second larger study from New York City reported HIV testing data from persons aged 19-59 years who were admitted at two public psychiatric hospitals during November 1989 through July 1991.[16] The HIV prevalence was 5.2% (50 of 962) and the prevalence rates were similar among women (5.3%) and men (5.2%).[16]

- **Duke Psychiatric Outpatient HIV Prevalence Study:** In a retrospective review at Duke University, HIV was present in 1.2% of the psychiatric patients seen in the outpatient setting, a prevalence rate approximately 4 times the rate of HIV in the general population in the United States (Figure 3).[17]

- **Four State Psychiatry Care HIV Prevalence Study:** In this 4-state study, testing for HIV, hepatitis C, and hepatitis B was performed on adults aged 18 to 60 undergoing inpatient or outpatient treatment in Connecticut, Maryland, New Hampshire, or North Carolina between June 1997 and December 1998.[13] The overall HIV seroprevalence rate was 2.7% (25 of 931), a rate at least 8 times the rate of the general United States population.[13]

- **Global HIV Prevalence in Persons with Serious Mental Illness:** In a large meta-analysis of articles published between January 1, 1980 and January 1, 2015 related to HIV prevalence in persons with psychiatric conditions. This analysis included multiple global regions, but when analyzing the subset of 21 studies from North America, investigators found an HIV prevalence of 6.0% in this patient population.[9]

- **Multisite HIV Prevalence Study in Mental Health Care Settings:** A separate multisite cross-sectional study conducted in Philadelphia and Baltimore from January 2009 to August 2011 found an HIV prevalence of 4.8% (51 of 1061) among persons seen in different types of mental health care settings (university-based inpatient psychiatric units, intensive case-management programs, and community mental health centers).[18]

HIV Transmission Risk

Mental health conditions increase HIV transmission risk primarily through poor medication adherence and increased sexual risk activities, often in the context of substance use.[19] Since persons with HIV who regularly take antiretroviral therapy markedly reduce their risk of transmitting HIV to sex partners, any factor that negatively influences antiretroviral adherence can interfere with medication-related transmission benefit.[20] Major depression has been linked to increased rates of nonadherence to antiretroviral therapy, thus raising the likelihood of HIV transmission to partners.[21,22,23] In addition, anxiety, depression, and bipolar disorder all have been linked to increased sexual activities associated with HIV transmission.[24,25,26] Treatment for mental health conditions, including treatment of substance use disorders, should part of the overall efforts to reduce HIV transmission.[27,28,29] 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 4). [28]
Impact of Mental Health Conditions on HIV Outcomes

Impact of Mental Health Conditions on the HIV Continuum of Care

The presence of mental health conditions in persons with HIV has correlated with decreased initiation of antiretroviral therapy, reduced medication adherence, and lower rates of viral suppression, all of which have significant implications for individual health as well as for HIV prevention efforts.[30] Studies have established a relationship between antiretroviral therapy nonadherence and symptoms of depression, posttraumatic stress disorder (especially in those patients with concomitant depression), and bipolar disease.[22,31,32] Individuals with bipolar disorder present particular challenges with respect to antiretroviral adherence, as these patients frequently demonstrate poor insight, mood fluctuations, housing instability, and poor adherence to psychiatric medications.[31] One study involving persons with HIV reported those with bipolar disorder had significantly lower adherence with antiretroviral therapy when compared with those who did not have bipolar disorder (47.7% versus 90.9%), with adherence defined in this study as the proportion of correctly taken doses over 30 days using electronic monitoring devices.[26] Posttraumatic 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.[33,34]

Impact of Mental Health Conditions on HIV Survival

Mental health conditions have been shown to predict adverse outcomes in some groups of individuals with HIV who were living with 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.[35] Among persons with HIV, people with mental health conditions experience increased morbidity and mortality when compared to comparable people who do not have these conditions.[36] Certain health problems are inherently increased in general with mental health conditions, such as the well-established association of major depression with heart disease. Treatment of mental health conditions can potentially cause harm, such as the development of obesity associated with taking certain antipsychotic medications. For all of these reasons, the treatment of mental health conditions in persons with HIV is an important component of achieving good long-term outcomes.
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. 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 shows addressing mental health care can have a major favorable impact on HIV outcomes.

- **Women's Interagency HIV Study (WIHS):** In the Women's Interagency HIV Study (WIHS), researchers analyzed the impact of depression on utilization of antiretroviral therapy in a total of 1,668 women with HIV who were enrolled in the WIHS at 6 sites nationwide between April 1, 1996 and September 30, 1998. That found individuals who used mental health services had a 20% increase in the adjusted odds of utilizing antiretroviral therapy compared to those who did not access mental health services.

- **Kaiser/Group Health HMO Study:** In a retrospective cohort study of 3,559 persons with HIV and depression who were enrolled in the Kaiser Permanente and Group Health Cooperative Health Maintenance Organizations (HMOs) in an 8-state region in the period January 2000 through December 2003, investigators analyzed the impact of depression and treatment of depression on HIV outcomes. Among individuals with depression, virologic suppression were lower, but those treated with selective serotonin reuptake inhibitors (SSRIs) had better adherence to antiretroviral therapy, improved virologic suppression, and a greater rise in CD4 cell count compared to their counterparts who did not receive SSRI treatment.

- **HIV Research Network (HIVRN):** In a large, retrospective analysis of 4,989 persons with HIV who were receiving outpatient treatment during 2000 through 2005 at 5 sites affiliated with the HIV Research Network, investigators reported individuals with a psychiatric diagnosis who had six or more mental health visits in a year were significantly less likely to discontinue antiretroviral therapy compared with individuals with no mental health visits.

- **Atlanta Metropolitan Study:** In this study, investigators followed 324 persons with HIV (on antiretroviral therapy) across a 3-month time period during the study period of March 2005 to October 2008, with the goal of analyzing the impact of adherence to psychotropic medications on both depressive symptoms and antiretroviral adherence. Overall, 33% (106 of 324) of those followed were also prescribed at least one psychiatric medication. The investigators reported depression was associated with lower antiretroviral adherence, but adherence to psychiatric medications, regardless of medication class, increased antiretroviral adherence.

- **UAB Project CONNECT:** In a retrospective analysis of 743 people with HIV who were seen at the University of Alabama at Birmingham (UAB) and enrolled in the Client-Oriented New Patient Navigation to Encourage Connection to Treatment (CONNECT) project between January 1, 2007 and December 31, 2013, investigators reported persons who received mental health service were more likely to be retained in primary care at 12 months relative to those who did not receive mental health services during their first year of care.
Neurocognitive Disorders in Persons Living with HIV

Estimates of Neurocognitive Disorders in Persons 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.[42] Overall, adults with HIV have poorer cognitive performance compared with those without HIV, regardless of age.[3,43,44] One cross-sectional observational study of persons with HIV reported neuropsychological impairment in 52% of study participants whereas other studies report prevalence rates ranging from 25 to 60%.[43,45] Similar to the general population, increasing age remains a strong predictor of poor neurocognitive performance in persons with HIV; other risk factors include low nadir CD4 count, previous central nervous system (CNS) injury, detectable plasma HIV RNA levels, and comorbid conditions, such as hypertension, insulin resistance, viral hepatitis, and substance use disorder.[3,43,46] 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 treatment of depression.[47,48] In this section we look at screening tools for both neurocognitive disorders in general as well as HIV-associated neurocognitive disorders in particular.

HIV-Associated Neurocognitive Disorder (HAND)

The term HIV-associated neurocognitive disorder (HAND) is used to describe the spectrum of neurocognitive dysfunction that includes (1) asymptomatic neurocognitive impairment, (2) mild neurocognitive disorder, and (3) HIV-associated dementia.[49] These three conditions have been classified based on criteria established by consensus research definitions, referred to as the Frascati Criteria, and are not readily applied to clinical settings.[50]

- **Asymptomatic Neurocognitive Impairment**: This refers to mild neuropsychological impairment in at least two domains that is not attributable to comorbid conditions.
- **Mild Neurocognitive Disorder**: This disorder is defined as involve mild neuropsychological impairment in at least two domains that is not attributable to comorbid conditions plus functional decline in activities of daily living.
- **HIV-Associated Dementia**: This type of dementia is characterized by neuropsychological impairment of at least moderate severity and major functional decline in at least two domains.

The Multicohort AIDS Study (a prospective study with gay and bisexual men) found that asymptomatic neurocognitive impairment doubles the risk of developing symptomatic HAND compared to a diagnosis of normal cognition.[45] In this 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.[43] By contrast, the prevalence of milder forms of HAND has not declined despite effective antiretroviral therapy, though the study results are complicated by a CD4 nadir below 200 cells/mm$^3$ in 70% of the participants. In addition to low nadir CD4 count, other risk factors linked to poor neurocognitive performance include increasing age, previous CNS injury, detectable HIV RNA, and comorbidities such as hypertension, viral hepatitis, substance use disorder and depression.[43,46]

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 for neurocognitive decline, including cerebrovascular disease, severe psychiatric disorders, Alzheimer’s disease, metabolic disorders (such as hypothyroidism), abuse of alcohol, 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.[3,51,52,53,54] Treatable causes of neurocognitive disorder, such as depression, thyroid disease, B12 deficiency, syphilis, opportunistic infection and tumor should be identified
and addressed.
Overview of Screening Tools for Common Mental Health Conditions

History of Mental Health Screening Tools

In the early 1990s, Drs. Robert Spitzer, Janet B.W. Williams, Kurt Kroenke, and coworkers developed the 26-item Primary Care Evaluation of Mental Disorders (PRIME-MD) patient questionnaire as a screening tool for five of the most common psychiatric disorders: (1) depression, (2) anxiety, (3) somatoform disorders, (4) alcohol use disorder, and (5) eating disorders.[55] Although the PRIME-MD emerged as a groundbreaking mental health screening tool, its utility in clinical practice settings has been limited by the long administration time required by the clinician to complete the 26-item survey. These same investigators subsequently developed and validated a self-administered form of the PRIME-MD known as the Patent Health Questionnaire (PHQ).[56] The development of the PHQ led to shorter, more practical screening tools, such as the PHQ-9 screening tool for depression and the generalized anxiety disorder 7 (GAD-7) screening tool. Online toolkits are available to screen for common mental health conditions.[57] See the screening tools for Mental Disorders Screening category of the Tools & Calculators section of this website.

Barriers to Usefulness of Screening Tools

It is important to note that the primary barrier to the usefulness 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 follow the initial screening. This problem has been well demonstrated for depression.[58,59] Barriers to treatment have led to a number of new team-based models for delivering mental health services within primary care; studies of these new models are promising,[60] but they are not often conducted in settings where HIV care is delivered.

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. The principles that define a good screening test are not unique to persons with HIV but rather apply to screening more generally. 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. In addition, screening tests should be limited to conditions for which there is available, effective treatment that can directly target the disease and improve prognosis and outcomes.[61] Most of the common mental health conditions seen among people with HIV have effective treatments.

Follow-Up for a Positive Screen

A positive screen for a mental health condition usually needs to be followed by a further diagnostic evaluation to clarify that the condition crosses the threshold for a true mental health condition. Unfortunately, there are no biological tests that can be conducted in clinical care settings to clarify the presence of the vast majority of mental health conditions. Additional testing for medical conditions, causing delirium and dementia, and tests for the presence of alcohol and other drugs, can improve diagnostic accuracy. There are research instruments for the diagnosis of mental health conditions, but these are too long and cumbersome for use in primary care. Several screening tools for the most common mental health conditions encountered in primary care are described below, with links provided to the screening tool.
Depression Screening Tools

The United States Preventive Services Task Force (USPSTF) has recently upgraded the strength of its recommendation for depression screening in the general adult population to a Grade B recommendation based on accumulating evidence that screening offers a moderate to substantial benefit.\[^{62}\] The USPSTF recommendation specifically stated “screen for depression, with adequate systems in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up.” Given the increased prevalence of depression in persons with HIV, the HIV Primary Care Guidelines recommend screening for depression at the initial visit and at periodic visits thereafter.\[^{63}\]

**Patient Health Questionnaire-9 (PHQ-9)**

The [Patient Health Questionnaire-9 (PHQ-9)](https://www.ptsd.va.gov/professional/tools-resources/screens/patient-health-questionnaire/phq9.cfm) is a self-administered questionnaire, which scores each of the 9 DSM-5 criteria as “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 tool for screening, diagnosing, monitoring, and measuring the severity of depression.\[^{64}\] The PHQ-9 has also been validated across diverse patient populations, including among African Americans, Chinese Americans, Latinos, and non-Hispanic whites.\[^{65}\]

- **Interpretation:** The PHQ-9 score ranges from 0 to 27. Increasing scores with the PHQ-9 clearly correlate with greater likelihood of major depression (Figure 5).\[^{64}\] In addition, a cumulative score of 10 points or higher has 88% sensitivity and specificity for major depression and scores of 5 to 9, 10 to 14, 15 to 19, and 20 and higher correlate with mild, moderate, moderately severe, and severe depression, respectively.\[^{64}\] For patients who have a score of 1 or greater on any question, an additional tenth question is asked that evaluates how these problems impact function at home, at work, and with others. The authors of a recent review of studies using the PHQ-9 concluded that it has acceptable diagnostic properties at a cutoff score of 10.\[^{66}\]

- **Recommendation:** Individuals who reach the threshold for a positive screen (a score of 5 or higher) should ideally be offered a full diagnostic interview using standard diagnostic criteria from the DSM-5.\[^{67}\] If a prompt further diagnostic evaluation is not available, the primary care clinician should use good clinical judgment taking into account the duration and severity of the depression, its impact on functioning, and the treatment preferences of the patient. Many experts consider a PHQ-9 score of 10 or higher as meeting diagnostic criteria for depression; most patients who screen positive for moderately severe depression or severe depression warrant treatment using antidepressants, psychotherapy, and/or a combination of both. In addition, any positive response on question 9 (presence and duration of suicide ideation) warrants immediate further evaluation to determine if there is 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.\[^{68}\]

**Patient Health Questionnaire-2 (PHQ-2)**

The [Patient Health Questionnaire-2 (PHQ-2)](https://www.ptsd.va.gov/professional/tools-resources/screens/patient-health-questionnaire/phq2.cfm) 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).\[^{69}\] The PHQ-2 focuses the time frame to 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 specificity of 90% for major depressive disorder. In one study, investigators concluded a cutoff score of 3 was the optimal cut point for screening purposes, with the qualification that moving the cut point to 2 would enhance sensitivity and moving to 4 would increase specificity (Figure 6).\[^{69}\]

- **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 with the PHQ-9, or a direct diagnostic psychiatric interview.[70] The PHQ-2 should not be used as a final diagnostic tool for depression.

2-Item PRIME-MD

The 2-item PRIME-MD, based on the 27-item PRIME-MD, is less commonly used but remains an option for screening for depression.[71,72] A positive screening result, answering “yes” to either one or both of the screening questions, requires additional evaluation with the PHQ-9 or a direct psychiatric interview that uses diagnostic criteria from the DSM-5.[67]

Hospital Anxiety and Depression Scale (HADS)

The Hospital Anxiety and Depression Scale (HADS), which was developed in 1983 to assess anxiety disorders and depression among patients attending hospital-associated clinics that were not psychiatric clinics, is another option for anxiety and depression screening.[73,74] Individuals who screen positive with a score of at least 8 points should be referred for a full diagnostic interview that uses diagnostic criteria from the DSM-5. Compared to several other screening tools, the HADS is not as useful in primary care settings.[75] Intereach the threshold for a positive score should be referred for a full diagnostic interview that uses diagnostic criteria from the DSM-5.
Anxiety Disorder Screening Tools

Two of the most common anxiety disorders are generalized anxiety disorder (GAD) and panic disorder. Screening for these disorders, combined with evidence-based treatment approaches, has been shown to improve patient outcomes, yet there are no formal recommendations for screening primary care patients, regardless of HIV status.[76] Some experts recommend screening all primary care patients for these two anxiety disorders, or at the very least, those with risk factors.

**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.[77, 78, 79] 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 the optimized sensitivity (89%) and specificity (82%) for diagnosing generalized anxiety disorder (Figure 7).[79] Scores of 0-4, 5-9, 10-14, and 15-19 correlate with minimal, mild, moderate, and severe levels of anxiety, respectively. A more recent meta-analysis suggested using a cutoff score of 8 to optimize sensitivity without compromising specificity.[80]
- **Recommendation:** Individuals who meet the threshold for a positive GAD-7 screen (a score of 8 or above) ideally should have a complete diagnostic evaluation.

**Patient Health Questionnaire for Panic Disorder (PHQ-PD)**

This 5-item screening instrument is one subset of questions (questions 3a-d and questions 4a-k) derived from the longer Patient Health Questionnaire (PHQ), which itself is a short, self-reported instrument derived from the 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 sensitivity of 44 to 66% and specificity of 87 to 95%, depending on the scoring algorithm that is applied.[81] 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.[81] 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 who screen positive require follow-up with a formal diagnostic procedure.
Posttraumatic 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 a known exposure to a traumatic stressor, such as following a natural disaster or after experiencing an accident, injury, or significant illness.[82] Some experts consider HIV and the events surrounding HIV acquisition as qualifying as such an exposure.[5, 8] 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.[82, 83, 84] 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.[83]

Primary Care Posttraumatic 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).[84] One study found that the previously used 4-item PC-PTSD was more effective when used in combination 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.[85]

- **Interpretation**: Different studies recommend different cut-off scores for a positive screen. A study involving 398 Veterans patients at a primary care clinic patients found a score of 3 correlated with 95% sensitivity and 85% specificity for the diagnosis of PTSD (Figure 8).[83, 84] 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 subsequently, estimates of lifetime prevalence of bipolar disorder vary widely across studies.[86] 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%. [87] There are no formal recommendations for screening for bipolar disorder; however, some experts recommend that primary care physicians implement selective screening for bipolar disorder in patients with known depression, anxiety, or substance use disorders.[86]

Mood Disorders Questionnaire (MDQ)

The Mood Disorders Questionnaire (MDQ) can be used to screen for 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 frequency and severity of “yes” responses. In primary care the question of whether a patient has bipolar disorder arises most frequently in the context of beginning an antidepressant medication because these medications can precipitate mania in vulnerable individuals. The MDQ is not a practical screening tool for most primary care clinicians, primarily because of the need to ask 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 your ever been told you 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. Yes answers would then lead to further inquiry.[88, 89]

- **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 9).[89]

- **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 most appropriately utilized to rule out bipolar disorder in patients presenting with depression, rather than as a general screening tool.[90, 91]
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.[92] 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.[93] 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 discriminate among the different HAND disorders is essential.

Screening Tools for Neurocognitive Disorders

Among the tools that are currently available, no consensus exists on which screening tool 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.[94, 95, 96] Several HIV-specific neurocognitive screening tools have been developed, but a consensus panel of experts on HIV neurocognitive disorders has concluded 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 of the available tools are less sensitive for detecting milder forms of cognitive impairment.[93] 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.[97, 98] A score of 24 points or lower (out of a total of 30 points) represents cognitive impairment. Most experts agree the MMSE is a weak tool for diagnosing HAND.[99, 100] Despite free available versions of the MMSE, Psychological Assessment Resources (PAR) now holds exclusive rights to the MMSE and claims that any use of the MMSE requires their permission and ordering through them. Due to poor performance for evaluation of 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 three-word registration, followed by a clock-drawing test, and then followed by three-word recall.[101] 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 to 2 indicates dementia. The test has sensitivity ranging from 76 to 99% and specificity ranging from 73 to 93% across studies.[94, 102] Because of its speed, accuracy, and the fact it does not require patient fluency in English, some primary care providers suggest using this test as the initial screen.[94] Again, the Mini-Cog is not specific to HAND.
The General Practitioner Assessment of Cognition (GPCOG)

The GPCOG consists of 6 initial questions involving registration and recall, time orientation, clock drawing, and historical questions. A two-part version of the GPCOG with an additional 6 questions can be used if the examiner knows the patient well enough to validate the historical questions. A score of 9 or above is considered normal, and a score of 4 or lower indicates cognitive impairment. For patients scoring in the 5 to 8 range who have a longstanding relationship with their provider, the second part of the GPCOG asks providers questions about the patient’s current functional status compared to 5 years ago. Using a cutoff of 7 points for dementia, the sensitivity and specificity for the GPCOG is 82% and 70%, respectively; the two-part GPCOG increases the specificity to 83%.[94]

Memory Impairment Screen (MIS)

The MIS is a 4-minute, 4-item delayed, free and cued recall test. The patient is given a piece of paper with the names of four different items (an animal, vegetable, city, and 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. A total of 2 points are given for items recalled without cueing, and 1 point is given for items recalled with cueing. 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%.[94]

Montreal Cognitive Assessment (MOCA)

The MOCA is a free, online, validated instrument that is 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. 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. Among individuals with HIV, the MOCA has only moderate sensitivity and poor specificity for detecting mild cognitive impairment.[105]

HIV-Specific Neurocognitive Screening Tools

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

The HIV Dementia Scale (HDS) is a test consisting of 4 items that address 4 cognitive domains: memory/recall, attention/learning, psychomotor functioning, and eye movements (visuoconstruction); the maximum score on the HDS is 16. The HDS was originally developed in 1995 and found to be superior to the Mini-Mental Status Exam (MMSE) for identifying HIV-associated dementia; in this study, using an HDS cutoff score of less than or equal to 10 for identifying HIV dementia, performed with sensitivity of 80%, specificity 91%, and positive predictive value 78%. The HDS has been found to have inadequate sensitivity and specificity for detecting milder forms of cognitive impairment. A modified version of the HDS (M-HDS) is a more practical screening tool for clinicians and non-neurologists. The modified test eliminates evaluation of antisaccadic eye movements, a process deemed difficult for non-neurologists.

International HIV Dementia Scale (IHDS)

In 2005, an 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. 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. The maximum score is 12 points. Patients with a score of 10 or lower should undergo further evaluation for possible dementia. A meta-analysis showed this test performed well when screening for dementia, but had low accuracy for milder HAND conditions.
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.[4]
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.\[^{62}\] The USPSTF statement outlines that implementation of the screening recommendation is best realized through a collaborative model of multidisciplinary, team-based care developed by the Community Preventive Services Task Force. This model uses case managers to connect primary care providers, patients, and mental health providers with 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

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.\[^{113}\] 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; 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 10).\[^{113}\] There is also interplay between the two cascades since depression is recognized to decrease engagement in HIV care and adherence to antiretroviral medication.\[^{113}\]

Despite the recognized mental health treatment gap, there is limited data related to evidence-based strategies that can be integrated into HIV primary care. Some proposed solutions include co-located services and the use of embedded mental health providers. Just as 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.\[^{114,115}\] 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.\[^{113,116}\]
Summary Points

- Screening tools for identifying mental health conditions, including HIV-associated neurocognitive disorders, among persons with HIV in the United States are important given the high prevalence of these conditions among adults with HIV.
- The prevalence of depression, anxiety, and posttraumatic stress disorder 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 co-existing substance use disorders often mediate this link.
- 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, evidence-based, and accessible to a range of providers without requiring specific training.
- Screening tools for some of the most common mental health diagnoses encountered in primary care include: 2-Item PRIME-MD, PHQ2, and PHQ-9 (depression); GAD-7 (generalized anxiety disorder), PHQ-PD (panic disorder); and PC-PTSD-5 (posttraumatic stress disorder). A positive result on any screening test requires confirmation with a formal diagnostic interview.
- HAND likely affects 50% of persons living with HIV, with 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 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, GPCOG, MIS, MOCA, European AIDS Clinical Society Cognitive Screen, HIV Dementia Scale, and International HIV Dementia Scale. None of these screens can reliably detect milder forms of HIV-associated neurocognitive impairment. Rather, with regard to HAND, these tools work best at screening for HIV-associated dementia, with the last two tools having been specifically developed for this purpose.
- Co-located services, the use of embedded mental health providers, collaborative care, and decision support tools may all help to integrate mental health care into HIV primary care and improve the HIV treatment cascade.
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Figures

Figure 1 Depression in Persons with HIV During the 2 Weeks before Interview—Medical Monitoring Project, United States, 2018 Cycle

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

Figure 2 Anxiety in Persons with HIV During the 2 Weeks before Interview—Medical Monitoring Project, United States, 2018 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 $\geq 15$, moderate anxiety as having a score of 10–14, and mild anxiety as having a score of 5–9.

Figure 3 HIV Prevalence in General Outpatient Psychiatric Population

These data were obtained through general outpatient psychiatric clinics at Duke University Medical Center during 2001-2004.

Figure 4 Positive Prevention Model Showing Hypothesized Effects of Mental Health Treatment on HIV Transmission Risk Behavior

Figure 5 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.

## Figure 6 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. These data are based on surveys from 580 patients who completed the PHQ-2 and had an independent mental health professional interviews.


<table>
<thead>
<tr>
<th>PHQ-2 Score</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Positive Predictive Value</th>
<th>Likelihood Ratio</th>
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<tbody>
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<td>59.2</td>
<td>15.4</td>
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<td>2</td>
<td>92.7</td>
<td>73.7</td>
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<td>26.8</td>
<td>99.4</td>
<td>78.6</td>
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Figure 7 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.


<table>
<thead>
<tr>
<th>GAD-7 Score</th>
<th>Sensitivity</th>
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<tr>
<td>15</td>
<td>48</td>
<td>95</td>
<td>8.7</td>
</tr>
</tbody>
</table>
Figure 8 Diagnostic Characteristics for the Primary Care PTSD Screen for DSM-5 (PC-PTSD-5)

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.


<table>
<thead>
<tr>
<th>Cut-off Score</th>
<th>Sensitivity</th>
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<th>Likelihood Ratio</th>
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</table>
Figure 9 Operating Characteristics of the Mood Disorder Questionnaire

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

Figure 10 Depression Treatment Cascade for Patients with HIV

This graphic shows that among all HIV patients with a major depressive episode in the past year, the estimated proportion of patients that have: the depression recognized clinically, receiving any treatment, receiving adequate treatment, and achieved remission.