

Overcoming DEPRESSION

Lisa Capaldini, MD
George Harrison, MD

Depression is one of the most prevalent and undertreated complications of HIV disease. Despite the improvements in health related to highly active antiretroviral therapy (HAART), women and men with HIV continue to be at risk for depression. Untreated depression not only can affect quality of life, but it also may compromise HAART adherence, weaken immune functioning, exacerbate chronic pain, and contribute to substance use. Depression might also lead to increased sexual risk-taking behavior in some people with HIV, potentially contributing to HIV transmission.

This article will address a range of questions concerning HIV-related depression. Why is depression so common in people with HIV? Is it seen more frequently in those with HIV disease than in uninfected individuals? If so, why? And if depression is so common, why is it typically overlooked by HIV clinicians? Finally, is depression treated differently in people with HIV, and what specific types of therapy or medications are most useful?

What Is Depression?

Like many disorders, depression is a syndrome, meaning it is characterized by a set of symptoms. A chief feature may be expressions of mood such as sadness or worry. These will often be accompanied by cognitive (related to perception, learning, and reasoning) symptoms such as poor concentration or complaints of memory loss. Often there are also physical signals including changes in sleep, appetite, libido (sexual desire), pain tolerance, or energy (see sidebar on page 21).

Importantly, the many presentations of depression are diverse, and the constellation of symptoms overlaps many other mental, behavioral, and physical disorders. For example, a depression diagnosis might be missed if the individual does not look sad but rather appears irritable, anxious, or excessively worried. Alternately, depressive symptoms may be caused by a coexisting medical condition such as fatigue associated with HIV, hepatitis C, or hypothyroidism (low thyroid hormone production).

The exact causes of depression are not known. Practically speaking, depression is associated with the faulty activity of brain hormones (neurotransmitters). Endogenous (produced by and for the brain) neurotransmitters such as serotonin, norepinephrine, and dopamine are necessary for normal brain and body function. When neurotransmitters are less active or lacking, dysfunction of brain and

body processes follows. Why this dysregulation of brain hormones occurs is far from understood. However, the effects of impaired neurotransmitter activity are well recognized: they cause a diverse set of changes in mood, thinking, energy, pain perception, and physical well-being.

The various effects of neurotransmitters are typical of substances that act on the brain. Caffeine, for example, can affect mood (it has antidepressant properties and can cause irritability), alertness, heart rhythm, and sleep. Likewise, nicotine, which also has receptors in the brain, can modulate mood, cognition, and energy.

Risk Factors

While the specific causes of depression are not established, many factors are known to increase the risk of this disorder (see sidebar on this page). One important—and unmodifiable—risk factor is family history. The risk of having a depressive disorder is increased if a family member has a mood disorder. The genetic mechanisms behind this heritability (is it due to one gene, or several? is it dependent on life experiences for expression?) are under investigation. Relatives may not have a diagnosis of depression per se, yet may show signs of suffering from debilitating depression: suicide attempts, “nervous breakdowns,” unexplained functioning problems, or self-medication with substances such as alcohol or drugs.

CONDITIONS THAT CAN MIMIC DEPRESSION

- hypogonadism (low testosterone)
- hypothyroidism (low thyroid hormone)
- advanced (tertiary) syphilis
- substance use
- vitamin B₁₂ deficiency
- advanced liver disease

Another important risk factor for adult depression is trauma or neglect during childhood. Epidemiological studies of humans, and experiments with primates, have shown that chaotic conditions or a lack of nurturing during childhood predispose individuals to depression as adults. For example, infant monkeys who are removed from their mothers for several months are more susceptible to depression when stressed as adults.

Adult trauma (violence, rape, severe loss) also increases the risk of depression. Significantly, coping with a diagnosis of a life-threatening disease such as HIV may be traumatizing. For some people, being diagnosed with HIV can be terrifying and result in the loss of relationships and the disruption of life plans. Several identifiable crescendo points of stress are associated with HIV illness, including a new HIV diagnosis, a first significant HIV-related illness, and a drastically reduced functional level if HIV disease progresses. Many people with HIV live in marginal circumstances and are already trying to cope with poverty or violence. For these individuals an HIV diagnosis may have an additive stressful effect.

One-third of people who have a substance use or dependence disorder also suffer from depression. A syndrome of acute mood changes associated with drug intoxication and withdrawal is well described. For example, stimulant (e.g., speed, cocaine) use can lead to depressive symptoms.

RISK FACTORS FOR DEPRESSION

- family history of depression
- family history of substance use
- history of childhood or adult trauma
- history of prior or current substance use
- diagnosis of brain disorder (e.g., HIV-related dementia, head trauma, stroke)
- history of multiple or cumulative stressors

Ironically, self-medicating with substances such as alcohol, speed, or heroin may be an attempt to treat depressive symptoms such as fatigue or listlessness. While these substances may temporarily mask depressive symptoms, they exacerbate depression over time. Long-term exposure to these substances may cause a direct effect on brain chemistry that appears to be associated with depression or other serious mental illness. Substance dependence may also cause disruption of social functioning (e.g., relationship or workplace problems), which puts the individual at further risk for a mood disorder.

Prevalence of Depression in HIV Disease

An important, and unresolved, question is whether depression is more common in HIV positive people than in the HIV negative population. This basic question is surprisingly difficult to answer. First, depression is more difficult to diagnose accurately in people with medical conditions such as HIV. An HIV positive person with fatigue, low sex drive, and cognitive problems could be experiencing depression, or these symptoms could be due to HIV itself. Second, people with HIV and depression may be depressed not because of their HIV infection, but because of other associated conditions such as substance use.

However, depression is at least as prevalent in HIV positive people as in those who are HIV negative. Depression is very common in the general population, affecting 5–15% of people at any given time, with a lifetime risk ranging between 15% and 25%, depending on survey methods. Women are about twice as likely as men to experience depression. Some studies show that there is an increased rate of depression in people who are HIV positive compared with the general population. Yet after controlling for confounding factors such as substance use or demographic information such

as sexual orientation, the differences in rates are less clear. (The prevalence of depression may be increased in lesbians and gay men, perhaps as a result of isolation or coping with homophobia.) Experts note that most HIV positive people with depression have risk factors aside from HIV infection.

Depending on how depression is defined and on the population being studied (women vs men, substance users vs nonusers, teens vs adults), the prevalence of depression in studies of people with HIV has ranged from 10% to 50%. Even if the lowest estimates are accurate, depression remains one of the most common conditions seen in people with HIV. Yet depression is a diagnosable and frequently treatable illness. The first step is recognizing the condition.

Screening for Depression

Standardized screening tests for depression include questionnaires conducted by clinicians, as well as those that individuals can take on their own. These questionnaires are screening tools; while they do not prove that someone is depressed, they seldom result in false negatives (i.e., miss depression). When recommending or using these exams, it is important to remember that they have been validated in the general population, but have not been specifically normalized for an HIV positive population.

Three common clinician-administered screening tools are the Zung Self-Rating Depression Scale, the

Hamilton Depression Scale, and the Beck Depression Inventory. These can be accessed online at www.fpnotebook.com/psych8.htm. In addition, several web sites offer self-administered tests (see sidebar on this page).

As an example of these tools, the Hamilton Depression Scale is a standardized depression screen used by clinicians and researchers. By assigning a gradated set of points to various symptoms, clinicians can both diagnose depression and assess its severity. Most depression studies use this or other scales to gauge the efficacy of interventions, as well as to characterize the population being studied. In effect, the Hamilton rating score is analogous to CD4 cell counts in HIV disease.

A streamlined and reasonably reliable depression screen is the following two-question survey that focuses on depressed mood and one other symptom, anhedonia (lack of pleasure): 1) *Are you sad or depressed frequently?* 2) *Are you unable to enjoy activities you normally find enjoyable?* If the answer to both questions is no, there is less than a 5% probability of depression.

Diagnosing Depression

Diagnosing depression is challenging in any population with chronic, coexisting conditions. As mentioned above, coexisting, or “comorbid,” conditions may cause physical symptoms that mimic the

DEPRESSION SCREENING TEST SITES

National Mental Health Association (NMHA)

www.depression-screening.org/screeningtest/screeningtest.htm

New York University Department of Psychiatry

www.med.nyu.edu/Psych/screens/depres.html

University of Michigan Department of Psychiatry

www.med.umich.edu/depression/screen.htm

symptoms of depression. Likewise, distinguishing between abnormal mood due to depression versus normal mood fluctuations caused by the stress of a chronic medical illness may be difficult. This overlap of physical and emotional symptoms often results in the underdiagnosis of depression. Clinicians may mistakenly attribute symptoms of depression to HIV itself or to medication side effects (fatigue, poor sleep, concentration problems). They may also attribute depressive mood symptoms (flat mood, irritability) to a normal reaction to living with HIV.

Clinicians' missing the physical and mood clues of depression has been documented in cancer and geriatric (elderly) populations as well as in people with HIV. Given that the physical symptoms of HIV disease and depression may be identical, and that a gray line exists between depressive mood symptoms and a normal reaction to stressors (referred to formally as an "adjustment disorder"), how can depression be accurately diagnosed in people with HIV?

A few practical principles can address these diagnostic challenges:

- depression is common
- the presence of risk factors for depression reliably increases diagnostic accuracy (see Risk Factors sidebar on page 19)
- several medical conditions can mimic depression and should be excluded in all HIV positive people with suspected depression (see sidebar on page 19)
- all studied antidepressants have equal efficacy in HIV positive and HIV negative individuals
- given the impact of untreated depression, a trial of psychotherapy, antidepressants, or both should be offered in uncertain cases

This last principle is considered an "inclusive" approach to depression diagnosis. In this approach, all symptoms that may be associated with either depression or HIV are assumed

to be due to depression. While this approach may overdiagnose depression, it prevents the underdiagnosis of the condition, which is far more likely in general.

Treatment for Depression

Treatment for depression includes counseling (psychotherapy), lifestyle changes, and medications. While these interventions will be discussed separately, they are complementary and often work best when used in combination. In some instances, treatments have been studied specifically in people with HIV, as noted below. In most cases, however, interventions have been formally studied in the general population but their usefulness in people with HIV has been confirmed by anecdotal experience.

Counseling

A large variety of group and individual counseling approaches have been used (and some of them studied) in HIV positive people suffering from depression. Because of the social, psychological, and neuropsychiatric consequences of HIV/AIDS, an individual might benefit from interventions spanning a spectrum from individual to family or group psychotherapy as well as psychodynamic/psychoanalytic, interpersonal, behavioral, and supportive approaches. Group work—from supervised group counseling to less formal peer support groups—can be especially useful for people with HIV who are isolated from other people with HIV infection. Individual therapy can be provided by therapists from a wide range of disciplines: social workers, marriage and family counselors, psychologists, and psychiatrists. For good referral sources, see sidebar on page 23.

Several principles hold across the variety of psychotherapy styles. The therapist should be familiar with HIV disease and understand the basics of HIV treatment. Substance use should be addressed, and if appropriate,

referral to substance abuse resources given. In addition, the therapist should help the client explore and develop effective coping mechanisms; this may include dealing with HIV disclosure to family, partners, and employers, or addressing spiritual issues.

After undergoing a mental health assessment, the individual can be presented with the range of possible counseling methods. Identifying a specific type of therapy to use, and locating available resources, is not always easy. Referral outcomes may be improved if the individual has an

SYMPTOMS OF DEPRESSION

Physical

- sleep disorders
 - difficulty falling asleep
 - disrupted sleep
 - early awakening
 - excessive sleeping
- fatigue, especially on waking
- low sex drive
- impaired concentration
- unexplained pain, especially abdominal pain or headache
- decreased or increased appetite

Mood

- irritability
- worry/rumination
- sadness/weepiness
- anhedonia, or inability to enjoy activities
- lack of motivation
- hopelessness
- self-blame/guilt
- lowered self-esteem
- suicidal ideation, or thoughts of committing suicide

accurate idea of what the treatment will be like. For the individual seeking therapy, preparing for the structure and expectations of counseling will decrease anxiety and make the process more engaging and dynamic.

For providers, a challenge of working in a large urban environment may be keeping track of the various counseling options available in the community. In areas without large numbers of HIV positive people, clinicians should be familiar with providers in the community who are skilled in working with different populations.

For HIV positive individuals, undertaking depression treatment is a complicated task, particularly when it involves counseling. Consultation and teamwork are the cornerstones of effective treatment due to the convergence of many different areas of clinical focus. It is likely that no single clinician will have an adequate depth of knowledge about all the medical, social, mental health, and/or substance use issues that will need to be addressed. Good communication between different providers—including social workers, therapists, substance use counselors, and primary care physicians—will help to enhance the effectiveness of any intervention.

Lifestyle Changes

While depression clearly disrupts daily living, it is easy to overlook the impact that lifestyle changes can have on this condition. Altering basic activities, including sleeping, eating, socializing, and exercise, can be a very effective intervention.

Sleep is often disordered in people with depression, who tend to get either too little sleep or excessive amounts. The principles of optimized sleep (known as sleep hygiene) include having regular waking and sleeping times, decreasing dependence on naps, reducing the use of stimulants such as caffeine, and making the sleep environment as conducive to sleep as possible. These seemingly simple guidelines are often more difficult to follow than they

would appear. However, the benefits may be substantial, and are not replicated by use of sleeping medication.

Nutrition, which is often a focus of attention in HIV positive people, may also be disordered (resulting from overeating or loss of appetite) in those with depression. Proper nutrition has obvious health benefits. It might also provide a less appreciated sense of well-being. The rhythm of regular meals can serve as a structuring element in a person's day to which other activities may be added. Including a social component with eating may further improve mental health.

Isolation contributes to depression and is a significant issue for some people with HIV. For many depressed people, increasing social contact is an important factor in their improvement. Isolation may be reduced by involvement in volunteer work, group activities based on common social or spiritual interests, structured day treatment settings, or having a pet.

While pet ownership for people with HIV has not been formally studied, pet stewardship has been analyzed in the general population and in the elderly, and has been shown to correlate with improved quality-of-life and disease-specific outcomes. Exactly how pets may enhance health is not known. The benefits may derive from a sense of structure (e.g., walking the dog), feelings of being needed, physical contact, and increased interactions with other pet owners. While having a pet does entail daily responsibilities and expense, for some people these costs are worthwhile.

Exercise may help reduce depressive symptoms as well as potentially improve muscle and immune function, sleep, and stamina. Exercise can be an enjoyable part of life, but many people—even without depression—are disinclined to take regular physical exercise. Exercise programs should be designed to fit each person's goals and limitations, and must be modified over time.

While living well would appear to be sensible, few of us are good at accomplishing these basic tasks as well as we could. When there are intervening HIV complications and depression, these life-enhancing tasks can become additional stressors. Often there is little motivation to make lifestyle changes. Clinicians should provide support and guidance to help individuals overcome barriers to using these important tools for the resolution of depression. Success in accomplishing some of these goals will also give the individual a sense of control that may be lacking.

Medications

Antidepressant medications work by increasing the availability of neurotransmitters in the brain, or central nervous system (CNS). Just as anti-retroviral drugs are categorized in classes such as protease inhibitors (PIs), antidepressants can be classed according to which hormone or hormones they act upon, and by what mechanism.

The two main concerns about antidepressants and people with HIV disease—whether the drugs work and whether they are safe—have been addressed and resolved. All antidepressants that have been studied in HIV positive people have shown efficacy comparable to their results in HIV negative individuals. Safety issues have centered on drug interactions between antidepressants and antiretrovirals. As discussed below, most of these interactions are not clinically significant, and aside from the interactions mentioned, standard doses of antidepressants are appropriate for people on anti-HIV therapy.

There are several types of antidepressant agents. Selective serotonin reuptake inhibitors, or SSRIs, are the most commonly used in people who have both depression and anxiety problems. These include fluoxetine (Prozac), sertraline (Zoloft), and escitalopram (Lexapro). Drugs such as imipramine (Tofranil), amitriptyline (Elavil), and nortriptyline (Pamelor)

REFERRAL SOURCES FOR COUNSELING

SAN FRANCISCO

- AIDS Health Project: 415-476-3902
- Asian and Pacific Islander Wellness Center: 415-292-3400
- Center for Special Problems: 415-292-1500
- Instituto Familiar de la Raza: 415-647-5450
- Iris Center: 415-864-2364
- New Leaf: 415-626-7000

NATIONAL/INTERNATIONAL

- In New York City, visit www.aidsnyc.org/links/counsel.html for a listing of mental health service providers.
- Local AIDS service organizations (ASOs) may be able to provide referrals. A list of ASOs in the U.S. as well as links to international organizations can be found at www.thebody.com/hotlines/other.html.
- One of the best resources for referrals are primary medical clinics specializing in HIV care. Clinicians at these agencies should know the local resources and be able to refer people to appropriate services.

are known as tricyclic antidepressants, or TCAs. TCAs can be especially useful in depressed individuals with sleep or pain problems. Other medications include bupropion (Wellbutrin), which is also used for smoking cessation, and nefazodone (Serzone). Antidepressant agents known as monoamine oxidase inhibitors (MAOIs) are not widely used due to the risk of life-threatening hypertension (high blood pressure) and the potential for lethal drug interactions. (For a listing of antidepressant drugs, see chart on page 24.)

All antidepressants take 3–6 weeks to achieve their optimum effect. In general, side effects are most common within the first two weeks of therapy and often improve over time. Side effects are predicted based on drug category. By far the most publicized is sexual dysfunction associated with SSRIs. Sexual dysfunction can take the form of decreased libido, decreased arousability, or delayed orgasm. These symptoms occur in about 40% of people taking

SSRIs and may be minimal or significant. SSRI-induced sexual dysfunction can be addressed with dosage reduction or use of other medications, such as bupropion.

Just as antiretroviral therapy must be individualized to suit each person with HIV, so too must antidepressant therapy. What might be a problematic side effect for one person might be a useful side effect for another. For example, an appetite promoter such as mirtazapine (Remeron) is generally avoided in obese people but may be an excellent choice for someone with impaired appetite or weight loss. The rule of thumb is to match potential side effects with the individual's symptoms. Extra caution should be used in treating people with prior central nervous system disease and advanced HIV.

Starting with a low antidepressant dose and escalating it cautiously over time to a normal dose is advised. A dosing strategy that complements an existing antiretroviral dosing schedule can increase medication adherence.

Follow-up about missed doses can also identify barriers to adherence and improve results. Medisets (plastic pill boxes labeled by days of the week) can be a useful tool to stay organized and also to help identify which antidepressant doses are most frequently missed.

The absence of an antidepressant's effect does not rule out depression. While a majority of people with depression will notice improved functioning with their first trial of an antidepressant, treatment-resistant depression is well documented.

Drug interactions

Most antidepressants are metabolized by the same cytochrome P450 liver enzymes as PIs and non-nucleoside reverse transcriptase inhibitors (NNRTIs). Clinically important drug interactions (significant increases or decreases in drug levels) might therefore be expected between most HAART drugs and most antidepressants. Experience has taught clinicians differently, however; with a few important exceptions mentioned in the sidebar on page 25, antidepressant choice and dosage are not affected by antiretroviral therapy.

Standard doses of citalopram, mirtazapine, and bupropion appear to be relatively free of unexpected changes in serum levels of either the antidepressants or antiretrovirals. Bupropion is an example of an antidepressant for which an interaction with an antiretroviral (in this case, ritonavir [Norvir]) was initially and incorrectly assumed.

Some people take a variety of alternative, over-the-counter medications such as St. John's wort (*Hypericum perforatum*), S-adenosylmethionine (SAM-e), or melatonin. Very little is known to date about the interaction of these agents with antiretroviral drugs. One report has found that St. John's wort reduces levels of indinavir (Crixivan), and the U.S. Food and Drug Administration (FDA) has warned about use of this agent with PIs and NNRTIs. Data in HIV

Antidepressants

	MECHANISM	BENEFITS	DRAWBACKS
Selective Serotonin Reuptake Inhibitors (SSRIs): fluoxetine (Prozac) sertraline (Zoloft) paroxetine (Paxil) citalopram (Celexa) escitalopram (Lexapro)	raise serotonin levels (some with minor norepinephrine effect)	good for anxiety, post-traumatic stress disorder (PTSD)	sexual dysfunction in up to 40%, only fluoxetine and paroxetine available generically
Tricyclic Antidepressants (TCAs): imipramine (Tofranil) amitriptyline (Elavil) desipramine (Norpramin, Pertofrane) nortriptyline (Pamelor)	raise serotonin and norepinephrine levels	inexpensive, can promote sleep, may downregulate pain	overdose danger, sedation, dry mouth, dizziness, constipation, difficulty with urination, heart rhythm abnormalities
Atypical Antidepressants: bupropion (Wellbutrin)	raises dopamine and norepinephrine levels	energizing, little sexual dysfunction, now available in once-a-day formulation, aids smoking cessation	may aggravate anxiety, generic formulation taken three times daily
mirtazapine (Remeron)	raises serotonin and norepinephrine levels	generic available, increased appetite, sedation, little sexual dysfunction	weight gain, sedation
nefazodone (Serzone)	raises serotonin levels	promotes sleep, little sexual dysfunction	morning sedation, rare hepatotoxicity, infrequent stimulating effect
venlafaxine (Effexor)	raises levels of serotonin at low doses, and both serotonin and norepinephrine at moderate doses	stimulating	nongeneric, may be too excitatory, sexual dysfunction, higher doses moderately increase blood pressure

DRUG INTERACTIONS

ANTIDEPRESSANTS AND HAART

nefazodone (Serzone) used with

ritonavir (Norvir), lopinavir/ritonavir (Kaletra), delavirdine (Rescriptor)

- expect to use lower than normal doses of nefazodone, follow for unexpected increase in side effects from the antidepressant or the antiretrovirals

tricyclic antidepressants (TCAs)

used with ritonavir, lopinavir

- use lower than normal doses of the TCA, obtain serum levels of the TCA, check EKG for conduction delays

venlafaxine (Effexor)

used with indinavir (Crixivan)

- venlafaxine may reduce the level of indinavir, consider an alternate antidepressant

St. John's wort (*Hypericum perforatum*)

used with PIs or NNRTIs

- not recommended in combination

negative people have shown that St. John's wort has mild antidepressant effects.

Drug interactions may be more likely in people with hepatic (liver) impairment, the elderly, or those taking newer HAART combinations. Again, clinical experience to date has shown that dose modification of most antidepressants is not appropriate or necessary with most antiretrovirals.

Summary

With improved antiretroviral therapies, HIV disease has become a potentially manageable chronic condition. Like many chronic conditions, however, HIV disease is often accompanied by other illnesses. Effective diagnosis and treatment of comorbid conditions such as depression may be crucial to the success of HAART regimens and their potential to enhance quality of life.

Addressing depression is therefore an important task for people with HIV and their health-care providers. Depression is the most underdiagnosed and undertreated condition among people with HIV as well as in the general population. As both effective counseling and medication resources are available, it is critical that these therapies be utilized by HIV positive women and men who might benefit from them.

Lisa Capaldini, MD, is an assistant clinical professor at the University of California, San Francisco (UCSF). She maintains a private practice in San Francisco.

George Harrison, MD, is an assistant clinical professor at UCSF and the medical director of the AIDS Health Project/UCSF Clinical Services Center.

Selected Sources

Bancroft, J. and others. Sexual risk-taking in gay men: the relevance of sexual arousability, mood, and sensation seeking. *Archives of Sexual Behavior* 32(6): 555–572. December 2003.

Burt, V.K. and Stein, K. Epidemiology of depression throughout the female life cycle. *Journal of Clinical Psychiatry* 63(Suppl 7): 9–15. 2002.

Dean, G. and others. Prevalence, diagnosis, and pharmacological treatment of mood disorders in HIV disease. *Biological Psychiatry* 54(3): 307–316. August 1, 2003.

Diagnostic and Statistical Manual of Mental Disorders: DSM-IV, 4th ed. American Psychiatric Association, Washington, DC. 1994.

McDaniel, J.S. and others. *Practice Guideline for the Treatment of Patients with HIV/AIDS*. November 2000. (www.psych.org/psych_pract/treatg/pg/hiv aids_revisebook_index.cfm.)

McGuire, L. and others. Depressive symptoms and lymphocyte proliferation in older adults. *Journal of Abnormal Psychology* 111(1): 192–197. February 2002.

Montano, C.B. Recognition and treatment of depression in a primary care setting. *Journal of Clinical Psychiatry* 55(12, Suppl.): 18–33. December 1994.

Ostrow, D.G. and others. Psychosocial correlates of incomplete adherence to HIV antiretroviral therapy (HAART): mental health matters. 8th Conference on Retroviruses and Opportunistic Infections. Chicago. February 4–8, 2001. Abstract 484.

Whooley, M.A. and others. Case-finding instruments for depression; two questions are as good as many. *Journal of General Internal Medicine* 12(7): 439–445. July 1997.

Scientific Advisory Committee Opening

BETA currently has an opening for a new Scientific Advisory Committee (SAC) member. SAC members are an unaffiliated group of HIV specialists in the San Francisco Bay Area who meet twice a year to evaluate the scientific merits and accuracy of BETA materials. All SAC work is done pro bono.

Letters of interest should be sent by e-mail to beta@sfaf.org, or by post to:

**Nicholas Cheonis
Editor, BETA
PO Box 426182
San Francisco, CA
94142-6182**