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Peer reviewed

Use of HAART Among Young People Living With HIV

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Objective: To examine HAART use. **Methods:** HIV+ youth, aged 14-29 (n=253; 71% male; 74% ethnic minority), were recruited in Los Angeles, San Francisco, and New York. **Results:** Almost all youth had been offered HAART (84%); 77% had ever used it, 54% were currently using, and 63% of users adhered to 90% of their medications. Compared to non-users, users were more likely to be female, Latino or

African American. Users were also more likely to have the following: AIDS, positive coping styles, social support, and a high quality of life. Users were less likely to: do jail time, perform sexual-risk acts, and use substances. **Conclusions:** HIV+ youth self-select to use HAART.

Key words: HAART, medication adherence, sexual risk, substance use, HIV

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Young people living with HIV (YPLH) account for about 50% of new HIV infections worldwide.¹ In the United States, YPLH are less likely to be identified as seropositive or linked to care than are older adults.² Highly active antiretroviral chemotherapy (HAART) is a multiple-drug regimen designed to interrupt the HIV replication process at multiple stages of replication. In 1996, only about one third of YPLH were using HAART,³ even when linked to care. From 1996 to 2001, HAART was recommended for all HIV-seropositive persons, and medications were provided free to persons living with HIV in the United States.^{4,6} There-

fore, we hypothesized that the use of HAART would increase across all persons living with HIV. The first goal of this study was to examine the use of HAART among YPLH.

The introduction of HAART has raised fears about increased transmission acts, such as having sex without a condom and having multiple partners, among those receiving HAART medications.^{3,5,6} Knowing that a low viral load is related to decreased risk of HIV transmission,⁷ YPLH who take HAART may feel free to increase the number of unprotected sex acts and not increase HIV transmission to others. In contrast to this hypothesis, HAART use may reflect selection bias in who chooses HAART or who gains access to HAART. YPLH who routinely take care of their health may also be more likely to seek HAART therapy; these YPLH may also decrease risk acts or have always had fewer risk acts than their seropositive peers not using HAART. Doctors may also select patients who appear "appropriate" for HAART,⁸ whereas not prescribing HAART medications to "inappropriate" YPLH (eg, injecting drug users). Given the potential mechanisms for selection

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bias in who receives HAART, the second goal of this study was to examine factors associated with HAART use and adherence, particularly sexual and substance-use transmission acts.

In order to identify a difference between YPLH who use HAART versus YPLH who do not, we assessed multiple domains in a young person's life. Historically, increased social support and lower levels of stress have been associated with more positive outcomes,^{9,10} YPLH with high levels of social support and low stress may use HAART and be more adherent to their medications. Similarly, coping styles characterized by seeking social support and taking positive actions have been associated with fewer risk acts among young people, whereas self-destructive and depressive styles have been associated with greater risk.¹¹ Finally, young people's quality of life may be an indication of their current adjustment.¹² Better-adjusted youth may engage in fewer transmission acts. These domains were assessed among users and non-users of HAART, as well as among users who were highly adherent to HAART and those who were not.

METHODS

Sample

From June 1999 to December 2000, 281 YPLH aged 14 to 29 years were recruited from HIV/AIDS clinical care sites, social service agencies, and street outreach programs, as well as through advertisements and community announcements in Los Angeles, New York, and San Francisco. Among the 281 YPLH, 8.2% (n=23) either refused to participate or were evaluated as too unstable or ill to participate, resulting in 258 eligible YPLH. No data are available to compare youth recruited and those refusing to participate.

Across cities, YPLH were recruited from 17 medical providers (n=66), 21 social service agencies (n=121), 2 needle-exchange programs (n=6), one drug-treatment center (n=4), 4 other research studies (n=5), outreach on the street or at special events (n=15), and through newspaper advertisements (n=12) and referrals from friends (n=19). Ten young people contacted the study from unknown sources. Although many youth were part of a convenience sample, a consecutive series of youth were approached from medical providers and social-service treatment settings, allowing us to docu-

ment 23 refusals. YPLH were linked to appropriate medical care prior to study enrollment. Parental consent was obtained if youth were under 18 years of age and the parent knew the young person's HIV status. Each YPLH was paid \$25 to participate in the 2-hour interview. Five interview files were damaged, thus unusable for this analysis.

Procedures

An ethnically diverse team of interviewers used laptop computers and audio computer-assisted self-interview (ACASI) procedures to collect information. Interviewer training included research ethics, emergency procedures for suicidal/homicidal ideations, psychosocial and substance abuse assessments, sexual-abuse reporting procedures, and intensive review of assessment protocols and mock interviews. Quality assurance interviews were conducted with 20% of audiotaped interviews. Interviewers met or exceeded expectations on 93% of tapes reviewed; remedial training was provided to interviewers.

Measures

Young people were queried regarding lifetime and recent behaviors (ie, the past 3 months) in multiple domains.

HAART Use

Based on an adapted measure,¹³ YPLH reported the specific HAART medications they were taking, the number of times per day each medication was supposed to be taken, and how many times a dose was missed or skipped yesterday, 2 days ago, 3 days ago, and if a dose was missed during the past weekend. Doses taken were summarized into a percentage, and youth were classified on HAART use in 3 ways: (1) recent users, (2) past users, and (3) nonusers. HAART adherence was calculated as the number of doses taken over those prescribed. Youth who adhered to 90% of their HAART medications over the past 3 days were classified as adherers (1) versus nonadherers (0).¹⁴ Reasons for not using HAART were reported on a 14-question checklist. Potential reasons for not using HAART were (eg, you were concerned about side effects; your doctor did not prescribe them) endorsed (1) or not (0).

Health Status

YPLH self-reported whether they expe-

rienced lifetime and current symptoms of HIV infection, whether or not they had been diagnosed as having AIDS, the date of HIV identification, the dates and results of the most recent T-cell/CD4 and viral-load counts, and the presence of hepatitis C and D. Their CD4 counts were reported on a measure previously demonstrated to have high reliability ($r=0.85$) between self-reports of CD4 and medical chart reviews.¹⁵

Sexual Behavior

YPLH self-reported the age of initiation of anal, vaginal, and oral sex; the lifetime numbers of male and female sex partners; bartering sex ("trading sex for money, drugs, food, or a place to stay"); ever having a sex partner who was an intravenous drug user (IDU); and proportion of condom-protected vaginal and anal sex acts over their lifetime. Reports of recent sexual behaviors (ie, over the last 3 months) included the number of vaginal and anal sex partners, partner's gender and perceived HIV serostatus, the number and proportion of condom-protected acts with each partner, the number of sex partners with whom the youth bartered sex, and number of anonymous sex partners. Sexually transmitted diseases (STD) and STD treatments were self-reported for lifetime, recently, and the time since notified of one's HIV serostatus.

Substance Use

Reports included alcohol, marijuana, inhalants, methamphetamines, stimulants/amphetamines, cocaine, crack, hallucinogens, heroin, and injection use. For each substance, YPLH reported the age of initiation, the approximate number of lifetime uses, number of days used recently, and the average number of times used per day recently. Recent use was estimated by multiplying the number of days used by the average number of times used per day in the past 3 months. Additional measures of substance use were (1) the presence or absence of hard drug use (constructed using all substance domains excluding cigarettes, alcohol, and marijuana); (2) the frequency of drug use calculated by summing the number of times of use of any type of drug; and (3) a weighted drug-use index. The weighted drug-use index was the sum of the number of times each drug was used multiplied by the drug's weight (marijuana=1,

amphetamines/stimulants=2; inhalants, hallucinogens=3; cocaine, crack, methamphetamine=4; heroin=5).^{16,17}

A validation study of self-reported substance use was conducted through urine samples from 82 of the participants whose reported substance-use frequency exceeded 4 times in the past 3 months. Almost all of those who tested positive for marijuana had self-reported marijuana use (84%; Kappa = .66; $n=37$); 83% of those testing positive for amphetamine had reported amphetamine use (Kappa = .76; $n=18$); 33% of those testing positive for cocaine metabolites had reported cocaine or crack use (Kappa = .31; $n=9$); and 60% of those testing positive for opiates ($n=5$) had reported heroin use (Kappa = .65). The Kappa of .31 suggests poor agreement between test results and self-report for self-reported cocaine or crack users.

Life Expectancies

Young people's life expectancies were assessed by asking them whether or not they expected to live to age 30, to age 50, and to age 70 years separately.

Negative Life Events

Lifetime and recent sexual abuse, suicide attempts, and jail experience were reported.

Mental Health Symptoms

The Brief Symptom Inventory (BSI)¹⁸ is a 53-item scale on which participants rate mental health problems experienced during the previous week. In addition, the BSI provides a clinical cutoff level ("caseness") that approximates having a diagnosable psychiatric disorder, using the global estimate of mental health problems (53 items, $\alpha=.97$) and 9 primary symptom domains: somatization ($\alpha=.82$), obsessive-compulsive disorder ($\alpha=.88$), interpersonal sensitivity ($\alpha=.76$), depression ($\alpha=.85$), anxiety ($\alpha=.81$), hostility ($\alpha=.81$), phobic anxiety ($\alpha=.79$), paranoid ideation ($\alpha=.79$), psychoticism ($\alpha=.71$).

Quality of Life

Quality of life¹⁹ was assessed by 11 items from the HIV/AIDS-Targeted QoL questionnaire, rated on a 1 to 5 scale (all to none of the time; positive attitude items were reverse coded so higher scores are better) covering 2 domains: being HIV positive (3 items, $\alpha=.61$) and general life satisfaction (8 items, $\alpha=.89$). The

Table 1
Reasons by Nonusers (n=116)
for Not Currently Taking
HAART

	%
No source	4
Side effects concerns	56
Not prescribed	14
Doctor advised against	28
No belief in efficacy	22
Not a good idea to change current treatments	16
On too many medications	20
Could not afford them	13
Could not adhere	47
Thought they would make you feel worse	56
Wanted to wait, feeling healthy	60
Wanted to wait, expecting better drugs	33
Others suggested not to take them	15
Actively decided not to take	73

Cronbach's alpha of .61 suggests reliability between the 3 questions composing the "being HIV positive" domain that borders on being low.

Social Support²⁰

Was assessed with a 19-item ($\alpha=.96$) Likert scale (1-5 range; 5 = high) concerning 4 domains: emotional/informational support (8 items, $\alpha=.92$), tangible support (4 items, $\alpha=.87$), positive social interaction support (3 items, $\alpha=.89$), and affectionate support (3 items, $\alpha=.87$).

Coping Style

Was adapted from the Dealing with Illness Inventory,^{21,22} and assessed with responses to 39 descriptions of stressful events rated on a 5-point Likert scale (1-5; *never to always*). The items yielded 6 scales of coping styles: positive action (10 items, $\alpha=.85$), depression/withdrawal (5 items, $\alpha=.62$), self-destructive escape (5 items, $\alpha=.79$), social support (5 items, $\alpha=.71$), spiritual hope (4 items, $\alpha=.65$), nondisclosure/problem avoidance (4 items, $\alpha=.62$), and passive problem solving (6 items, $\alpha=.76$). The Cronbach's alphas for the depression/withdrawal, spiritual hope, and nondisclosure/problem avoidance scales suggest question reliabilities that border on being low.

Statistical Methods

We tested equality of means for HAART users and nonusers using 2-sided t-tests for continuous variables. If the variable was highly skewed, we used a Wilcoxon rank sum test instead. For contingency tables, we used a chi-square test; if expected counts were less than 5 in any contingency table cell, then we used Fisher's exact test. We used the same procedures for comparing HAART adherers to nonadherers. Logistic regressions were performed to predict HAART use and adherence from covariates in the previous analyses.

RESULTS

Sample

Most young people were recruited from Los Angeles (n=119; 47%) and New York (n=100; 40%), with only 13% (n=34) recruited from San Francisco. Most young people were male (71%), and 82% of these males self-identified as gay or bisexual. Young people ranged in age from 14 to 29 (mean = 22.9, SD=3.7), with 6% under age 18 and 59% between the ages of 18-23. Overall, 19% were white, 32% were African American, 42% were Latino, and 8% were of other ethnicities. On average, young people had known that they were infected for about 3.8 years (range 0-17.8 years); 3 YPLH reported being infected during infancy. At recruitment, 24% were diagnosed with AIDS and 55% were symptomatic for HIV infection.

HAART Use

Currently, 54% (137/253) of YPLH were using HAART, whereas 77% had used HAART at some point. Reasons for not currently taking HAART are summarized in Table 1. On average, YPLH gave 4.6 reasons for why they were not currently taking HAART (SD=2.5). Two reasons indicated that use was linked to physicians' either discouraging or refusing to prescribe HAART for 16% of the sample.

Past users (n=59; 23%) and nonusers (n=57; 23%) differed on some of the reasons they gave for not currently using HAART: all of the past users knew where to obtain HAART versus 91% of nonusers (Fisher's exact test, P=.026); 78% of past users were concerned about or had experienced side effects versus 53% of nonusers who were concerned about side effects or thought HAART would make them feel worse ($\chi^2 = 8.24$,

Table 2
Sociodemographics and Self-Reported Health Status for YPLH
Who Currently Use and Do Not Use HAART

	Users % (n=137)	Nonusers % (n=116)	Total n=253	$\chi^2_{(df)}$
Sociodemographics				
Site				12.60 ₍₂₎ **
Los Angeles	56% (67)	44% (52)	119	
San Francisco	26% (9)	74% (25)	34	
New York	61% (61)	39% (39)	100	
Gender				6.13 ₍₁₎ *
Males	49% (88)	51% (91)	179	
Females	66% (49)	34% (25)	74	
Ethnicity ^a				4.38 ₍₁₎ *
White	40% (19)	60% (28)	47	
African American	59% (47)	41% (33)	80	
Latino	57% (60)	43% (45)	105	
Other ethnicities	52% (11)	48% (10)	21	
Self-reported sexual identity				2.71 ₍₂₎
Gay or Bisexual	50% (79)	50% (78)	157	
Straight	61% (51)	39% (32)	83	
Not reported or questioning	54% (7)	46% (6)	13	
Self-reported Health Status				
Have AIDS				3.93 ₍₁₎ *
Yes	66% (40)	34% (21)	61	
No	51% (97)	49% (93)	190	
Experienced symptoms of HIV				
Lifetime				0.04 ₍₁₎
Yes	53% (73)	47% (64)	137	
No	55% (60)	45% (50)	110	
Past 3 months				1.95 ₍₁₎
Yes	48% (39)	52% (43)	82	
No	57% (94)	43% (71)	165	
CD4 cell count (n=182)				2.16 ₍₁₎
<200	68% (17)	32% (8)	25	
≥200	52% (82)	48% (75)	157	

χ^2 is chi-square statistic; df is degrees of freedom

* P<.05; **P .01

a Chi-square test compares white to other ethnic groups

df=1, P=.0041); 36% of pastusers felt that they were on too many medications versus 4% of nonusers ($\chi^2 = 18.77$, df=1, P<.0001).

Comparisons of HAART Users and Nonusers

As summarized in Table 2, females (66%) were more likely than males (49%) to use HAART (P=.013). African American, Latino and YPLH of other ethnicities tended to use HAART more often than

white YPLH did (P=.036). There were no age differences between users and nonusers of HAART.

YPLH with AIDS tended to use HAART more often than YPLH without AIDS (P=.048). Symptomatic and asymptomatic YPLH used HAART at similar rates. HAART users and nonusers reported similar CD4 cell counts whereas users reported lower viral loads than nonusers (Wilcoxon test, P=.0016). Users and nonusers had known they were HIV positive

Table 3
Comparisons of Sexual Behavior for YPLH Who Currently Use and Do Not Use HAART

	Users % (n=137)	Nonusers % (n=116)	$\chi^2_{df=1}$ or $t_{df=238}$	Wilcoxon P-value
Lifetime^a				
Less than 10 partners	38% (52)	19% (22)	10.95**	
Bartered sex	39% (53)	63% (73)	14.77**	
Had IDU partners	33% (45)	59% (68)	17.46**	
Mean Age at first sex (SD)	13.7 (3.2)	12.9 (3.5)	2.05*	
Median # partners (IQR)	20 (6-100)	59 (14.5-325)		0.0004
Past 3 months				
Median # partners (IQR) ^a	1.5 (1-3)	3 (1-10)		0.0002
Median # partners (IQR)	0 (0-1)	1 (1-5)		0.0021
Median # HIV-/status unknown partners(IQR)	0 (0-1)	1 (0-2)		0.13
Median # Anonymous partners (IQR)	0 (0-0)	0 (0-2)		0.005
Anonymous partners	17% (23)	32% (36)	7.40**	
No sex or 100% condom use	59% (81)	50% (57)	2.31	
Bartered sex	7% (9)	18% (20)	7.33**	
STD				
Lifetime	47% (63)	61% (71)	4.77*	
Since HIV positive	32% (42)	36% (42)	0.59	
Recently, past 3 months	8% (11)	11% (13)	0.61	

χ^2 is chi-square statistic; t is t-test statistic; df is degrees of freedom
 * P<.05; **P<.01

a Refers to anal, vaginal, or oral sex. Rest of table refers to anal or vaginal sex.

IQR Interquartile range

for a similar period of time.

Sexual Behavior

As shown in Table 3, users' first lifetime sexual act occurred almost a year later than that of nonusers (P=.042). Over their lifetime, users reported about one third of the median number of sexual partners as nonusers reported (P<.001). Compared to nonusers, users were less likely to have more than 9 partners, to barter sex, and to have IDU sexual partners (each with P<.001).

Comparisons of recent sexual behavior were similar to the patterns of lifetime sexual behavior; users had fewer sexual partners overall (P=.0021) and fewer anonymous partners (P=.005), and they were less likely to barter sex (P=.0068). Users and nonusers had similar numbers of partners whose HIV status was unknown or seronegative.

Sexually Transmitted Diseases (STDs)

Users reported a lower lifetime STD rate than did nonusers (P=.029), but users and nonusers reported similar rates of specific STDs: gonorrhea (25%); human papiloma virus (HPV; 24%); herpes (19%); chlamydia (18%); syphilis (12%); hepatitis B (10%); trichomoniasis (9%); nongonococcal urethritis (2%); chancroid (0.4%); and pelvic inflammatory disease (20% among women). On average, users and nonusers reported similar rates of STDs recently (10%) and since learning they were HIV positive (34%).

Substance Use

As shown in Table 4, over their lifetime and recently (each with P<.05), users reported lower substance-use rates for injecting drugs, nonprescription marijuana use, methamphetamines, stimulants or amphetamines, crack, heroin,

Table 4
Comparisons of Substance Use for YPLH Who Currently Use and Do Not Use HAART

	Lifetime				Past 3 months			
	Total %(n=253)	Users %(n=137)	Nonusers %(n=116)	$\chi^2_{df=1}$	Total %(n=253)	Users %(n=137)	Nonusers %(n=116)	$\chi^2_{df=1}$
Used								
Alcohol	92% (233)	90% (123)	95% (110)	2.20	70% (178)	64% (88)	78% (90)	5.37*
Injection drug use	23% (57)	11% (15)	36% (42)	22.96**	12% (30)	1% (2)	24% (28)	30.91**
Marijuana (non-prescribed)	83% (210)	77% (105)	91% (105)	8.57**	54% (137)	48% (66)	61% (71)	4.30*
Methamphetamines	38% (95)	27% (37)	50% (58)	14.61**	21% (52)	9% (13)	34% (39)	22.77**
Stimulants/Amphetamines	26% (67)	20% (27)	34% (40)	7.04**	11% (28)	4% (6)	19% (22)	13.58**
Inhalants	40% (102)	38% (51)	44% (51)	1.09	10% (25)	5% (7)	16% (18)	7.53**
Cocaine	50% (126)	45% (61)	56% (65)	3.33	16% (41)	10% (14)	23% (27)	7.89**
Crack	36% (90)	28% (38)	45% (52)	8.01**	10% (26)	4% (6)	17% (20)	11.27**
Hallucinogens	45% (113)	35% (48)	56% (65)	11.21**	12% (31)	9% (12)	16% (19)	3.39
Heroin	18% (45)	13% (18)	23% (27)	4.41*	6% (14)	2% (3)	9% (11)	6.39*
Hard drugs	69% (175)	61% (83)	79% (92)	10.33**	42% (107)	29% (40)	58% (67)	21.00**
Median (IQR)				Wilcoxon P-value				Wilcoxon P-value
# drugs used	3 (1-5)	2.5 (1-5)	4 (2-6)	0.0002	1 (0-2)	1 (0-1)	1 (1-3)	<.0001
Drug use frequency	323.5(8-2210)	127.5(2-1430)	706.5(46-2955)	0.0032	7.5(0-161)	2(0-52.5)	44(1-256)	<.0001
Drug index ^a					12 (0-226)	3 (0-72.5)	104 (1-475)	<.0001

χ^2 is chi-square statistic; df is degrees of freedom
 * P-value <.05; **P-value <.01

^a Not calculated for lifetime

IQR Interquartile range

and hard drug use. Users used hallucinogens less often over their lifetime ($P=.0008$) and recently tended to use less often ($P=.066$). In the past 3 months, users also reported lower rates of use of alcohol ($P=.021$), cocaine ($P=.0086$), and inhalants ($P=.0061$), whereas rates for lifetime use of these substances were similar between users and nonusers. Lifetime cocaine use tended to be lower among users ($P=.068$). Over their lifetime and recently (each with $P<.01$), users had used fewer drugs and used them less frequently; users had lower weighted drug-use index scores. In addition, injecting drug users were more likely to have been diagnosed with hepatitis C or D

(41%) than were noninjectors (2%; $\chi^2 = 72.11$, $df=1$, $P<.0001$). Because HAART users are less likely to be injection-drug users, HAART users are also less likely to have been diagnosed with hepatitis C or D (5% versus 17%; $\chi^2 = 8.59$, $df = 1$, $P=.0034$).

Life Events

As shown in Table 5, most YPLH (95%) expected to live to age 30 years, but users anticipated a longer life than nonusers did, with a higher percentage expecting to live to age 50 ($P=.0058$) and 70 ($P=.0015$). Users and nonusers had similar lifetime rates of being sexually abused (62%) and attempting suicide (46%); recent suicide attempts tended to be higher among non-

Table 5
Comparisons of Life Events and Psychological Scales for YPLH
Who Currently Use and Do Not Use HAART

	Users n=137	Non-Users n=116	$\chi^2_{df=1}$
Life Expectancy			
At least age 30	96%	94%	0.78
At least age 50	72%	55%	7.62**
At least age 70	47%	28%	10.07**
Sexually Abused			
Never	40%	36%	2.50 ^a
Before age 13	37%	32%	
Age 13 or later	24%	32%	
Attempted Suicide			
Lifetime	45%	47%	0.21
Past 3m	4%	9%	3.61
Spent Time in a Jail-type Facility			
Lifetime	42%	63%	10.80**
Past 3m	4%	18%	14.47**
BSI score			
	Mean (SD)	Mean (SD)	t_{df=251}
Anxiety	1.0 (.8)	1.2 (.9)	1.19
Depression	1.1 (1.0)	1.2 (.9)	0.98
Total	1.1 (.8)	1.2 (.8)	1.21
Quality of Life Sum			
Felt about HIV status	10.5 (3.2)	10.0 (3.3)	1.12
Life satisfaction	30.5 (7.0)	27.8 (7.5)	3.01**
Social Support			
Emotional/informational support	31.1 (7.9)	28.1 (8.5)	2.90**
Tangible support	15.3 (4.5)	13.7 (4.8)	2.62**
Positive interaction	11.8 (3.2)	10.5 (3.6)	3.19**
Affection	12.1 (3.3)	10.9 (3.7)	2.68**
Overall support index	74.1 (17.9)	66.8 (19.2)	3.15**
Coping Styles Score			
Positive action	31.7 (8.8)	28.2 (8.6)	3.20**
Depression withdrawal	10.4 (3.9)	10.7 (3.9)	0.69
Self-destructive escape	7.7 (3.8)	11.1 (5.2)	5.94**
Social support	13.3 (4.7)	11.9 (4.6)	2.40*
Spiritual Hope	11.9 (3.5)	10.5 (4.3)	2.79**
Nondisclosure	11.6 (4.1)	11.4 (4.0)	0.45
Passive problem solving	17.5 (5.7)	17.6 (6.0)	0.13

χ^2 is chi-square statistic; t is t-test statistic; df is degrees of freedom

* P<.05; **P<.01

a df=2, not significant

users (P=.058). Suicide attempts related to HIV status were common (44%) and

were similar among users and nonusers. Users were less likely than nonusers to

have spent time in jail over their lifetime ($P=.001$) and recently ($P=.0001$).

Users and nonusers had similar rates of mental health problems on the BSI (74% above the clinical cutoff score for users and nonusers). Comparing our sample to nonpatient samples of persons aged 20-29 years in the BSI manual,¹⁸ our sample reported significantly higher overall BSI scores ($t=7.74$, $df=390$, $P<.0001$ for females; $t=16.22$, $df=506$, $P<.0001$ for males). For participants under the age of 20 years ($n=38$), adolescent BSI scores were similar between YPLH and normative adolescent samples.¹⁷ Users reported more social support than did nonusers ($P=.0018$), including emotional/informational support ($P=.0041$), tangible support ($P=.0094$), positive interaction ($P=.0016$), and affection ($P=.0078$). Users expressed higher life satisfaction on the quality-of-life (HAT-QOL) scale ($P=.0029$), and their coping styles were significantly higher on positive actions ($P=.0016$), spiritual hope ($P=.0057$) and social support ($P=.017$). Similarly, users reported significantly lower rates on self-destructive escape-coping styles ($P<.0001$) than did nonusers. Depression withdrawal, nondisclosure, and passive problem-solving coping styles were similar for users and nonusers.

Predictors of HAART Use

Significant covariates from the previous analyses of HAART use were entered into a logistic regression simultaneously to predict HAART use. The number of different drugs used recently ($B=-.36$, $SE=.14$, $P=.007$) and a self-destructive coping style ($B=-.12$, $SE=.04$, $P=.003$) were significant predictors of HAART use. The following predictors were not significant: gender, ethnicity, sexual orientation, the number of recent sexual partners, satisfaction on the quality-of-life scale, overall social support, and the coping styles of taking positive action, seeking social support, or using spiritual hope.

HAART Adherent Users Versus Nonadherent Users

Among 136 current HAART users, 85 (63%) youth indicated that they had adhered to 90% or more of their HAART medications in the past 3 months (adherers). The sociodemographic profiles of adherers and nonadherers were similar in gender, ethnicity, age, and

sexual orientation. There were no geographic variations in reports of adherence (LA, SF, or NYC). Adherers and nonadherers were also similar on health indices: being diagnosed with hepatitis C or D, having AIDS, experiencing symptoms of HIV, CD4 and viral-load reports, and the length of time knowing their serostatus.

HAART adherers were less likely to have bartered sex during their lifetime ($\chi^2 = 4.02$, $df=1$, $P=.045$) and more likely to have used condoms with recent sex partners ($\chi^2 = 6.35$, $df=1$, $P=.012$) than were nonadherers. Sexual patterns were similar among adherers and nonadherers for age of sexual debut, number of lifetime and recent sexual partners, having high-risk partners, bartering sex, and number of anonymous partners. Adherers were less likely to have had an STD since learning their serostatus than were nonadherers ($\chi^2 = 3.97$, $df = 1$, $P=.046$), and even contracting hepatitis B (4% vs. 14%; Fisher's exact test, $P=.045$). Substance use patterns were very similar among adherers and nonadherers, except for the frequency of recent drug use, which was lower among adherers (Wilcoxon test, $P=.0025$).

Compared to nonadherers, adherers were less likely to be sexually abused after the age of 12 years ($\chi^2 = 6.17$, $df=2$, $P=.046$), attempt suicide ($\chi^2 = 3.85$, $df=1$, $P=.050$), use a depression withdrawal coping style (t -test = 2.07, $df=134$, $P=.04$), and to use self-destructive escape coping styles (t -test = 2.48, $df=134$, $P=.014$). Those adhering to HAART reported a higher life satisfaction on the quality-of-life (HAT-QOL) scale (t -test = 2.89, $df=134$, $P=.0045$). Those adhering and not adhering to HAART reported similar life expectancies, jail experiences, mental health problems, social support indices and positive actions, spiritual hope, nondisclosure, and passive problem-solving coping styles.

Predictors of HAART Adherence

A number of significant covariates from the previous analyses of HAART adherence were also entered into a logistic regression at the same time to examine their joint predictability of HAART adherence. The frequency of recent drug use ($B=-.0037$, $SE=.0016$, $P=.02$) was a significant predictor of HAART adherence. The rest of the predictors are as follows and were not significant: gender, ethnicity,

self-reported sexual identity, using condoms with recent sexual partners, life satisfaction on the quality-of-life scale, depression withdrawal, and self-destructive escape coping styles.

DISCUSSION

The sample is a strength of the current study. A diverse sampling strategy was implemented to recruit young people living with HIV in the 3 largest AIDS epicenters (New York City, San Francisco, and Los Angeles). In medical centers, community-based clinics, and with substantial outreach and advertising, 253 young people participated.

The sample of YPLH reflects the sociodemographic profile of the YPLH nationally.²³ Most are young gay or bisexual men (72% our sample; 72% nationally) and most are of ethnic minority heritage (74% our sample; 60% nationally). The age distribution is similar to national summaries with few young people identified as seropositive in early adolescence. Young people's self-reports of their substance use appear comparable to screens of urine for a broad range of drugs, endorsing the validity of youth's reports. However, the validity of youth's self-reports for opiates and more serious drugs (eg, cocaine) is more questionable.

HAART use has increased since the introduction of the medications in 1996. Use rose from 34%⁴ in 1997 to 54% in 2000 between 2 similar samples of YPLH. However, both rates are relatively low given that treatment guidelines suggest that HAART should be routinely prescribed.²⁴ In both studies, a substantial proportion of young people also report discontinuing HAART after initiation of the medication: 40% in 1998-1999⁴ and 23% among our current sample. Increasing numbers of youth are using HAART today.⁴ However, if higher use and adherence rates are to be encouraged, interventions must be mounted to help youth to sustain motivation to maintain their medications over time.

A surprising finding was that white, non-Latino youth use HAART less often than do their cross-ethnic African American and Latino peers. Among adults, the opposite occurs. White adults living with HIV use HAART more often than do African Americans, Latinos, or those of other ethnicities.^{25,26} However, our sample was recruited from agencies oriented to serv-

ing youth of ethnic minority heritage. These providers gave access and encouragement for HAART use to the youth; the agencies are a model for providers to adults living with HIV and suggest the role of community-based organizations in health care delivery for HIV positive persons.

Three barriers appear linked to discontinuation of medication: perceived difficulty in access, expectations of the number of daily pills, and adverse side effects. Patient-oriented interventions that educate patients about the ways to access and pay for HAART, set realistic expectations of medications, and improve skills for coping with side effects, may improve continued use. Alternatively, structural interventions, such as broad social-marketing campaigns on access to HAART and improved medication delivery systems by pharmaceutical companies, are also likely to improve use rates, especially among the disenfranchised.

Overall, patterns of transmission behavior are very different from an earlier sample recruited in 1993-1994.¹¹ In 1993, about 22% of seropositive young people engaged in recent unprotected sex acts and injecting drug use.¹¹ However, in the current sample, 45% of YPLH had recently engaged in unprotected sex acts. These data are consistent with observations of transmission acts among adults living with HIV.²⁷ These patterns suggest that social expectations concerning the consequences of transmission acts may be changing among YPLH in the United States. The potential reasons for increasing rates must be the focus of further research.

The recent documentation of increased sexual-risk acts among gay men is hypothesized to be related to perceptions that HAART decreases HIV transmissibility.²⁷ Yet, there is no evidence supporting this hypothesis among YPLH in our sample. In fact, it appears that young people who use HAART, as well as those who consistently adhere to their medications, are those more likely to have self-selected to use HAART. HAART users are significantly more likely to have longer life expectancies and fewer negative life events; they are less likely to have been in jail, to attempt suicide, and to have been sexually abused. They also report more life satisfaction and more positive coping styles. Users are more likely to take positive action as a coping style, as

well as seek social support and rely on spiritual hope. These are significant strengths. Similarly, adherers to their HAART medications also have a life history reflecting less risk-taking lifestyles. Young people who adhere to at least 90% of their medication doses are less likely to have bartered sex, have a recent STD, attempt suicide, or abuse drugs; are less depressed and self-destructive in their coping style, and report greater life satisfaction. These data suggest that HAART is used and adhered to by young people who have a history of less risky lifestyles. However, future research should examine youth's shifting perceptions of transmissibility when using HAART in a longitudinal design, in order to disentangle the effect of health perceptions on transmission behaviors.

Self-selection also appears to operate for HAART use based on reported reasons for nonuse; doctors do not appear to pre-select youth. Only 34% of nonusers (n=40; 16% of sample) report being discouraged from using HAART by a physician at some point. However, we did not assess physician's behaviors among those using HAART.

These data suggest that young people who are using and adhering to HAART medications are those who have a lifetime of responsible behaviors and effective coping styles. YPLH whose behavioral styles are safer continue to be highly responsible and consistent in their health behaviors. Future prospective studies should examine if prescribing HAART may increase YPLH's responsible behaviors and promote positive coping styles. Given the individual youth's patterns of responsible lifetime behaviors, the higher rates of recent transmission behaviors among youth in this study (recruited from 1999 to 2000) compared to HIV-positive youth in 1993¹¹ also suggest a cultural shift is occurring among gay men. Higher rates of transmission behaviors are occurring among youth who show extremely responsible lifestyles.

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REFERENCES

1. UNAIDS. Listen, Learn, Live! World AIDS Campaign with Children and Young People: Facts and Figures. Geneva, 1999:2-17.
2. Rotheram-Borus MJ, Futterman D. Promoting early detection of HIV among adolescents. *Arch Pediatr Adolesc Med.* 2000;154:435-439.
3. Aidsinfonyc.org. Federal HIV treatment guidelines: Uncle Sam says. HIV Plus 2000, 8. Available: <http://www.aidsinfonyc.org/hivplus/issue8/soc/federal.html>. Accessed January 18, 2002.
4. Gwadz M, De Vogli R, Rotheram-Borus MJ, et al. Behavioral practices regarding combination therapies for HIV/AIDS. *Journal of Sex Education and Therapy.* 1999;24:81-88.
5. Department of Health and Human Services. Guidelines for the Use of Antiretroviral Agents in HIV-infected Adults and Adolescents. Washington, DC: Author, 1998. Available: http://www.hivatis.org/guidelines/adult/Jun17_98/698glaa.pdf. Accessed January 18, 2002.
6. Department of Health and Human Services. Guidelines for the Use of Antiretroviral Agents in HIV-infected Adults and Adolescents. Washington, DC: Author, 1999. Available: http://www.hivatis.org/guidelines/adult/May05_99/AAMay599.pdf. Accessed January 18, 2002.
7. Aidsinfonyc.org. Federal HIV treatment guidelines: Uncle Sam says. HIV Plus 2000, 9. Available: <http://www.aidsinfonyc.org/hivplus/issue9/soc/federal.html>. Accessed January 18, 2002.
8. Centers for Disease Control and Prevention (CDC). 1999 USPHS/IDSA Guidelines for the prevention of opportunistic infections in persons infected with human immunodeficiency virus. *MMWR* 1999;48:1-59. Available: <http://www.cdc.gov/epo/mmwr/preview/mmwrhtml/rr4810a1.htm>. Accessed January 18, 2002.
9. Wight RG, LeBlanc AJ, Aneshensel CS. Support service use by persons with AIDS and their caregivers. *AIDS Care.* 1995;7:509-520.
10. Evans DL, Leserman JL, Perkins DO. Severe life stress as a predictor of early disease progression in HIV infection. *Am J Psychiatry.* 1997;154:630-634.
11. Rotheram-Borus MJ, Lee MB, Murphy DA. Efficacy of a preventive intervention for youth living with HIV. *Am J Public Health.* 2001;91:400-405.
12. Rotheram-Borus MJ, Murphy DA, Wight RG, et al. Improving the quality of life among young people living with HIV. *Evaluation and Program Planning.* 2001;24:227-237.
13. Chesney MA, Ickovics JR, Chambers DB, et al. Self-reported adherence to antiretroviral medications among participants in HIV clinical trials: the AACTG Adherence Instruments. *AIDS Care.* 2001;12:255-266.
14. Huebner DM, Gerend MA. The relation between beliefs about drug treatments for HIV and sexual risk behavior in gay and bisexual men. *Ann Behav Med.* 2001;23:304-312.
15. Murphy DA, Rotheram-Borus MJ, Joshi V. HIV-infected adolescent and adult percep-

- tions of tuberculosis testing, knowledge, and medication adherence among HIV-infected adolescents and adults. *AIDS Care*. 2000;12(1):59-63.
16. Kandel DB, Logan JA. Patterns of drug use from adolescence to young adulthood: I. Periods of risk for initiation, continued use, and discontinuation. *Am J Public Health*. 1984;74:660-666.
17. Rotheram-Borus MJ, Murphy DA, Swendeman D, et al. Substance use and its relationship to depression, anxiety, and isolation among youth living with HIV. *International Journal of Behavioral Medicine*. 2000;6:293-311.
18. Derogatis LR. Brief Symptom Inventory: Administration, Scoring, and Procedures Manual. Minneapolis, MN: National Computer Systems, Inc., 1993.
19. Holmes WC, Shea JA. Performance of a new, HIV/AIDS-targeted quality of life (HAT-QoL) instrument in asymptomatic seropositive individuals. *Qual Life Res*. 1997;6:561-571.
20. Sherbourne CD, Stewart AL. The MOS social support survey. *Soc Sci Med*. 1991;32:705-714.
21. Namir S, Wolcott DL, Fawzy FI, et al. Coping with AIDS: psychological and health implications. *J Appl Social Psychol*. 1987;17:309-328.
22. Murphy DA, Rotheram-Borus MJ, Marelich W. Factor structure of a coping scale across two samples: do HIV-positive youth and adults use the same coping strategies? *J Appl Soc Psychol*. In Press.
23. Centers for Disease Control and Prevention (CDC). U.S. HIV and AIDS Cases Reported Through December 2000 Year-End edition. Atlanta: Author, 2000;12(2):1-48.
24. U.S. Department of Health and Human Services - The HIV/AIDS Treatment Information Service (ATIS). Guidelines for the Use of Antiretroviral Agents in HIV-Infected Adults and Adolescents (February 5, 2001). Available: http://www.hivatis.org/guidelines/adult/Feb05_01/text/adherence.html. Accessed January 18, 2002.
25. Shapiro MF, Morton SC. Variations in the care of HIV-infected adults in the United States. *JAMA*. 1999;281:2305-2315.
26. Bozzette SA, Berry SH. The care of HIV-infected adults in the United States. *N Engl J Med*. 1998;339:1897-904.
27. Roehr B. Windy City Times: The Voice of Chicago's Gay and Lesbian Community: Government revises HIV Treatment Guidelines. Chicago: Lambda Publications Inc, 2001. Available at: <http://www.outlineschicago.com/Outlines/01221/hivtreatment.html>. Accessed January 18, 2002.