HIV Women's Health: A Study of Gynecological Healthcare Service Utilization in a U.S. Urban Clinic Population

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Abstract

Background: Women infected with HIV have a high rate of many gynecological problems. Adherence to recommended gynecological care among women enrolled in our urban HIV clinics was hypothesized to be low. **Methods:** We conducted an analysis of data from the Johns Hopkins HIV Clinical Cohort Database examining demographic and clinical predictors of clinic visit adherence by women in the HIV primary care and HIV gynecological clinics.

Results: Between January 2002 and April 2006, 1,086 women had 26,401 scheduled appointments to the two clinics, of which 21,959 were to HIV primary care and 4,442 were to HIV gynecological care. There were 12,097 (55%) completed primary care visits and 1,609 (36.2%) completed HIV gynecological visits ($p < 0.001$, accounting for clustering). By multivariate analysis, age < 40 years (OR 0.81, 95% CI 0.70-0.94) and substance abuse (OR 0.67, 95% CI 0.61-0.73) were associated with a decreased likelihood of attending an HIV primary care appointment. African American race (OR 0.63, 95% CI 0.45-0.90), CD4 count < 200 cells/mm³ (OR 0.73, 95% CI 0.56-0.95), and substance abuse (OR 0.57, 95% CI 0.45-0.71) were associated with a decreased likelihood of attending an HIV gynecological appointment.

Conclusions: This analysis determined that the rate of clinic visit adherence is significantly lower for HIV gynecological care than for HIV primary care in the same population of women. Factors associated with HIV gynecological clinic visit noncompliance included African American race/ethnicity, substance use, and more advanced immunosuppression. We have planned additional quantitative and qualitative studies to examine the associations with and barriers to HIV gynecological care, with the goal of creating appropriate interventions toward improving gynecological healthcare utilization among women enrolled in urban HIV clinics.

Introduction

THERE ARE AN ESTIMATED 1.2 million people living with HIV in the United States, and 300,000 of these are women.¹ In Maryland, there are 14,346 people living with HIV, of whom 5,424 (38%) are women.² Women infected with HIV are at increased risk for many gynecological problems, including vaginitis, genital herpes, genital condylomata, pelvic inflammatory disease (PID), and lower genital tract dysplasia and neoplasia.³⁻⁵ HIV-infected women have higher rates of cervical, vulvar, vaginal, and anal intraepithelial lesions than HIV-uninfected women,⁶ and invasive cervical cancer is an AIDS-defining illness. Based on our clinical experiences, however, we hypothesized that adherence to recommended gynecological care in our urban HIV clinic environment was poor.

Since the introduction of highly active antiretroviral therapy (HAART), HIV has become a chronic disease, and people infected with HIV require diverse preventive, acute, and long-term healthcare services.⁷ When available and recommended services are not used correctly, not only is quality of patient care compromised but also healthcare costs increase.⁷ Information on gynecological healthcare utilization patterns in the HIV-seropositive population can reveal underutilized and wasted resources and disparities in care. To better understand the extent of this problem, we analyzed data from an urban HIV clinic population where both primary and gynecological care is offered to HIV-infected adult women. This analysis was designed to determine the prevalence of scheduled visit compliance and to identify factors contributing to or associated with HIV gynecological scheduled clinic visit compliance.

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Materials and Methods

The Johns Hopkins University AIDS Service provides comprehensive primary and subspecialty medical care, including gynecological care (the Johns Hopkins HIV Women's Health Program), that is located in a single clinic facility. The majority of patients who are seen there for HIV primary care are also referred to the Johns Hopkins HIV Women's Health Program for all preventive and acute gynecological care. The HIV primary care examination rooms are not equipped for pelvic examinations or for collecting gynecological specimens. Once a patient is referred to the HIV Women's Health Program, that patient's subsequent gynecological care is maintained and scheduled through the HIV Women's Health Program. With one exception, the HIV primary care and gynecological providers are different providers. The waiting room and registrar are shared.

All continuity care patients who enroll in the HIV primary care clinic are offered the opportunity to join a prospective, observational clinical cohort. The refusal rate is <1.5%. At baseline, a comprehensive evaluation of medical and social histories, physical examination, and laboratory studies is recorded. These data are prospectively updated from the clinic-based medical record by trained data monitors every 6 months, with new medical diagnoses, hospitalizations, procedures, pharmaceutical prescriptions and filling, and laboratory and radiographic results. Maintenance of the cohort and use of its contents for analysis of patient outcomes are approved by the Institutional Review Board of the Johns Hopkins University School of Medicine.

This study is based on a subset of data collected on women who had at least one visit to the HIV clinic during January 2002 to April 2006. Clinic appointments to the HIV primary care and HIV gynecological clinics were recorded as completed, missed, or cancelled. A cancelled visit (either by the provider or the patient) was not designated as a missed visit. The percentages of missed visits for each of the two clinics were calculated. We also compared clinic visit adherence for the two clinics and conducted multivariate analyses using logistic regression. A generalized estimating equations (GEE) approach was used to account for clustering of multiple clinic visits by the same patients. The multivariate analyses examined the association between clinic visit adherence for the two clinics with race (African American or Caucasian), age <40 years, CD4 count <200 cells/mm³, HIV-1 RNA level >400 c/mL (copies per milliliter of blood), receiving HAART prior to the scheduled appointment, having a history of an AIDS-defining opportunistic illness (OI) prior to scheduled appointment, having a history of hospitalization prior to scheduled appointment, heavy alcohol use (defined as self-reported >7 drinks per week, on average, at baseline), and illicit or injection substance use (any self-reported history of cocaine or heroin use at baseline). Age 40 was chosen as a break point for several reasons: 95% of endometrial cancers are diagnosed in women aged ≥40, so women > age 40 with irregular bleeding generally receive more aggressive evaluation⁸; most gynecological malignancies are diagnosed in women >40 years, even in women with HIV⁹; it is also the age when yearly mammography should begin.¹⁰

Results

Table 1 shows the demographic characteristics of the 1,086 total female patients who had at least one visit between Jan-

uary 2002 and April 2006. The mean age was 36.6 years, with 84% of patients self-identified as African American. There was a high prevalence of illicit substance abuse at baseline in this population, with 58% of patients reporting some history of cocaine or heroin use by injection or other administration. These women had 26,401 appointments to the two clinics, of which 21,959 were to primary care and 4,442 were to gynecology. There were 12,097 (55.1%) completed HIV primary care clinic visits, and there were 1,609 (32.2%) completed HIV gynecological clinic visits. By logistic regression accounting for clustering, patients were half as likely to appear for their HIV gynecological clinic appointments as for their HIV primary care visit appointments (OR 0.48, 95% CI 0.44-0.52). By multivariate analyses, age <40 years (OR 0.81, 95% CI 0.70-0.94) and any illicit substance abuse at baseline (OR 0.67, 95% CI 0.61-0.73) were associated with a decreased likelihood of attending an HIV primary care appointment (Table 2). African American race (OR 0.63, 95% CI 0.45-0.90), CD4 count <200 cells/mm³ (OR 0.73, 95% CI 0.56-0.95) and any illicit substance abuse at baseline (OR 0.57, 95% CI 0.45-0.71) were associated with a decreased likelihood of appearing for a scheduled HIV gynecological appointment (Table 3).

Discussion

No previous study has compared adherence by women to HIV primary care and gynecological visits simultaneously using actual clinic records data. Although there is a relatively low rate of scheduled primary care clinic visit adherence in our population of HIV-infected women, the rate of gynecological clinic visit adherence is significantly lower than the rate of primary care visit adherence in the same population of women. It is important to note that this study was done in a facility where the gynecological specialty services are located in the same clinic facility, which is intended to facilitate comprehensive care. However, these results demon-

TABLE 1. DEMOGRAPHIC CHARACTERISTICS OF 1,086 FEMALE PATIENTS

	Mean 36.6, SD 8.5
Age	
Age, years	
<40	734 (68) ^a
≥40	352 (32)
Race	
Caucasian	156 (14)
African American	911 (84)
Other	19 (2)
IDU ^b	623 (57)
Cocaine users ^b	611 (56)
Heroin users ^b	650 (60)
Any substance abuse ^c	634 (58)
Alcohol use ^d	460 (42)
Alcohol overuse ^e	290 (27)
CD4 (cells/mm ³) ^f <200	786 (72)
HIV-1 RNA (c/mL) ^f >400	937 (86)

^aNumber (%).

^bSelf-reported injection drug use from baseline (ever used).

^cCompiled from any reported injection drug use, heroin or cocaine use from baseline (ever used).

^dSelf-reported any alcohol use.

^eSelf-reported > 7 drinks per week on average from baseline.

^fFrom medical record, recorded from baseline.

TABLE 2. DEMOGRAPHIC AND CLINICAL PREDICTORS OF HIV PRIMARY CARE CLINIC VISIT ADHERENCE

<i>Characteristic</i>	<i>Adjusted OR</i>	<i>95% CI</i>	<i>p value</i>
Race	0.89	0.73–1.08	0.24
Age^a	0.81	0.70–0.93	0.003
CD4 count (cells/mm ³)	1.01	0.86–1.19	0.87
HIV-1 RNA (c/mL)	0.87	0.72–1.04	0.13
HAART	1.03	0.88–1.2	0.69
History of OI	0.93	0.80–1.07	0.30
History of hospitalization	1.09	0.94–1.28	0.26
Alcohol use	1.08	0.95–1.24	0.24
Alcohol overuse	0.88	0.76–1.03	0.11
Any illicit substance use	0.64	0.55–0.75	0.000

^aBold indicates statistically significant.

strate that there remain what would appear to be substantial barriers to gynecological care in HIV-infected women. The high rate of missed gynecology appointments indicates a potentially serious healthcare diagnosis and management problem, especially given the high rates of gynecology-associated illness known to occur in this population.

Gynecological healthcare is an important component of ongoing HIV care in women. A study of 262 HIV-infected women found that 46.9% had at least one incident gynecological condition with serial assessment, including such conditions as vulvovaginal candidiasis, oncogenic human papillomavirus (HPV), abnormal Pap smears, genital warts, and amenorrhea.¹¹ In a study of 65 women admitted to an inpatient AIDS service, 83% had coexisting gynecological disease, although only 9% were admitted with a primary gynecological problem.³ The prevalence of cervical dysplasia in HIV-infected women varies from 11% to 60%,^{12–14} rates approximately 10-fold higher than that observed among HIV-uninfected women.¹⁵ Studies have shown that Pap smear sensitivity and specificity are comparable in HIV-infected and uninfected women,¹² although mild cytological atypia, such as atypical cells of undetermined significance (ASCUS) and inflammation, are more likely to be associated with dysplasia in HIV-infected women than in HIV-uninfected women and should prompt follow-up, generally including colposcopic examination.^{4,16} There is a clearly increased prevalence of squamous intraepithelial lesions (SIL) among HIV-infected women, and diagnosis of SIL in the HIV-infected woman always warrants colposcopic examination.^{4,5,12} Confirmation of a high-grade cervical lesion man-

dates excisional treatment to prevent progression to invasive cervical cancer, an AIDS-defining illness. Furthermore, unlike other AIDS-associated infections, effective combination antiretroviral therapy and immune reconstitution are not clearly associated with reduction or regression of HPV-related lesions, including lower genital tract dysplasia, although study findings are mixed.^{17,18}

Few studies have examined adherence with gynecological visits among HIV-positive women. The prospective Swiss HIV Cohort Study (SHCS) examined factors associated with frequency of gynecological follow-up, including cervical cancer screening, in a cohort of 2,186 HIV-positive women using self-reported data; they found that only 45% of those women reported seeing a gynecologist within the previous 6 months, although 82% of the women reported having a Pap smear. Predictors for fewer gynecological examinations and Pap smears were older age, nonwhite ethnicity, current IVU, lower education, lower CD4 counts, underweight, obesity, and current smoking.¹⁹ Another study showed that 70% of a sample of U.S. urban HIV-positive women reported having had a gynecological examination in the previous year.²⁰ These results, which are based on self-reported data, suggest that adherence with recommended gynecological care among HIV-positive women is inadequate.

Most studies of gynecological healthcare utilization in the HIV-seropositive population have focused on compliance with recommended cervical cancer screening, Pap smear evaluation, and follow-up of abnormal Pap smear results. One large study of 43,000 HIV-positive women found that a significant percentage of women who had abnormal Pap

TABLE 3. DEMOGRAPHIC AND CLINICAL PREDICTORS OF HIV GYNECOLOGICAL CLINIC VISIT ADHERENCE

<i>Multivariate analysis</i>	<i>Adjusted OR</i>	<i>95% CI</i>	<i>p value</i>
Race^a	0.64	0.45–0.90	0.011
Age	0.89	0.69–1.11	0.28
CD4 count (cells/mm³)	0.72	0.56–0.95	0.014
HIV-1 RNA (c/mL)	0.86	0.64–1.15	0.32
HAART	0.99	0.78–1.26	0.96
History of OI	1.27	0.99–1.60	0.05
History of hospitalization	1.11	0.88–1.41	0.38
Alcohol use	1.05	0.85–1.3	0.64
Alcohol overuse	0.81	0.63–1.04	0.09
Any illicit substance use	0.57	0.46–0.71	0.000

^aBold indicates statistically significant.

smears did not receive a repeat Pap test or colposcopy.¹³ A study of adherence to colposcopy among 462 women with or at risk for HIV infection found that adherence rates were 65% and comparable to the national average but “nevertheless unacceptably low for a group at such high risk for SIL.”²¹ A 2006 Quality Improvement Program Review of HIV primary care services conducted by the Baltimore City Health Department Ryan White Title I Office showed that only 50% of HIV-positive women in Baltimore City had received a Pap smear in the previous year.²² Our finding of an association between a CD4 count <200 cells/mm³ and greater nonadherence to scheduled clinic visits is particularly troubling, as the incidence and the severity of gynecological pathology may be greater in women with advanced immunosuppression.

Our study found that African American race increased the risk of missed gynecological visits but not missed HIV primary care visits. Our study population is 84% African American, which may differ from other study populations. One study showed that urban HIV-positive African American women were less likely to have had an outpatient visit in the previous 6 months or to have been on OI prophylaxis.²⁰ Several studies have also identified race/ethnicity as a factor associated with cervical cancer screening disparities in the HIV-uninfected population. In 1996, the National Institutes of Health (NIH) issued a consensus statement on cervical cancer, which stated that in the United States, ethnic and racial minority women, elderly women, medically uninsured women, and low-income women were not screened or were not screened at regular intervals for cervical cancer.²³ In a 2005 study conducted by the National Breast and Cervical Cancer Early Detection Program (NBCCEDP) on recommended follow-up for ASCUS or low-grade SIL (LSIL) of over 10,000 women, only 44% of women received appropriate follow-up, and African American women were least likely to receive appropriate follow-up.²⁴ Studies focusing on minority racial/ethnic populations indicate that lack of health insurance, lower level of education, lack of continuity of care, and lower use of public services were associated with lack of adherence to annual Pap smears.^{25–27} Unfortunately, we did not have data to assess income, employment, or education. All of our patients were either insured or were eligible to receive primary and gynecological care paid by the Ryan White CARE Act support, which does not require an enrollment wait time or other special procedure in our region, so insurance was not likely a barrier in this study.

We also found that substance use was associated with a decreased rate of both gynecological appointment and primary care visit adherence. One study showed that U.S. urban HIV-positive intravenous drug users were less likely to report having a regular doctor or any outpatient visit in the previous 6 months.²⁰ Although there is scant literature on the association of substance abuse with primary care or gynecological appointment adherence, several studies examining the HIV-infected population in general have linked such factors as substance abuse to HIV medication nonadherence.^{28–31} One study of 150 HIV-infected people found that drug use was associated with a 4-fold greater risk of medication adherence failure.³² Unfortunately substance use and abuse in women is closely linked to HIV: the CDC reported that 1 in 5 new HIV diagnoses in women were related to injection drug use in 2005.¹ Women who sell or trade sex for

drugs are at risk for HIV infection through sexual transmission. A study of HIV-positive African American women with histories of childhood sexual abuse found that substance use was a significant health problem, as well as a barrier to healthcare.³³ Crack cocaine use has been negatively associated with colposcopy adherence among women with or at risk for HIV infection.²¹

Our results indicating a generally low rate of appointment adherence are consistent with results of other studies of barriers to healthcare utilization in HIV-infected women. For example, HIV-infected women are less likely to be on combination antiretroviral therapy and are more likely than men to have hospitalizations and emergency room visits.³⁴ Other studies have suggested that healthcare systems are not structured to meet women’s healthcare needs: clinics tend to have inconvenient and inflexible hours, long waits, and a lack of staff from the same ethnic or racial groups as most patients.³⁵ Authors have suggested that cultural values and beliefs, as well as such competing needs as for food, clothing, and shelter, may adversely affect Pap smear screening among women from racial and ethnic minority groups.²⁷ Subsistence issues, such as lack of transportation and fear of the consequences of missing work, also have been identified as barriers to HIV-infected women receiving healthcare.³⁶ One study of HIV-positive African American women found that barriers to healthcare included confidentiality issues, difficulty getting an appointment, long clinic wait times, and obligation to care for others. These authors call for HIV care interventions that link the cultural beliefs and values of the population with the health skills and attitudes being promoted in the clinic.³³ Child care issues have been postulated to be a potential barrier to keeping medical appointments. Some physicians caring for HIV-infected women have advocated “a multidisciplinary approach to treatment and prevention that would address women’s life circumstances along with their medical needs.”^{35, p 652} Many of these factors may explain the generally low rate of appointment adherence we found but do not necessarily explain the discordantly low rate of gynecological appointment adherence, as many of these issues should have affected both HIV primary care and gynecological care, which are located in the same clinic facility. Both clinics use the same clinic operating hours, waiting room, and clinical space (although different sets of rooms), registrars, and medical assistants for vital signs. Wait times for appointment after referral, as well as wait times to be seen on the day of appointment, are similar. However, HIV primary care and HIV gynecological care appointments are rarely scheduled on the same day for each patient. In a national study of self-reported factors associated with cervical cancer screening among HIV-positive women, women who reported having a gynecologist and a primary care provider at the same clinical site were almost twice as likely to report having had a Pap smear in the previous 12 months.¹³ The authors concluded that providing gynecological care at the same site as primary HIV care might improve delivery of gynecological care. We did not find this to be the case at our clinic site.

This was an analysis of data from our prospective, observational clinical cohort. Therefore, we did not have additional variables of interest, such as income, employment, housing status, education, or psychosocial and behavioral factors. One study of HIV-infected U.S. adults found that 26% of patients perceived discrimination by healthcare

providers and that this could discourage medication adherence and follow-up.³⁷ Psychosocial measures, including depression, HIV stigma, low coping self-efficacy, low adherence self-efficacy, poor-perceived patient-provider relationship, low-perceived respect, and low-perceived utility of treatment also have been cited as contributing to medication nonadherence among HIV-infected clinic patients.^{38,39} As mentioned, belief factors, such as embarrassment, fear of discomfort during the gynecological examination, and fear of pathology, may be barriers to gynecological care, as may logistical concerns, such as child care issues. Several studies focusing on the Hispanic population have identified fatalistic attitude toward cancer, as well as embarrassment, fear, and pain during the pelvic examination, as potential barriers to having a Pap smear.^{40,41} Another study focusing on female college students also identified embarrassment and pain as potential barriers to undergoing a pelvic examination or a Pap smear, although the majority of women in the study had undergone Pap smears in the past year.⁴² We did not have access to these variables in our study.

We recognize the limitations of an analysis of data as a means to explore these behavioral and emotional issues, so we have developed subsequent quantitative and qualitative phases for study of this problem. In order to further examine and determine the barriers to HIV gynecological clinic visit adherence, we have developed and will be administering a targeted questionnaire to women who receive both HIV primary care and HIV gynecological care at our clinic. We will also conduct a qualitative study using focus groups comprising women who receive both HIV primary care and gynecological care at our clinic, which will attempt to further elucidate the major barriers to gynecological care for these women.

Our study of an urban HIV-positive population database shows a low rate of HIV primary care clinic visit compliance and a dramatically low rate of HIV gynecological clinic visit compliance. More information is needed to examine the barriers to HIV gynecological clinic visit adherence in this population, and we have quantitative and qualitative studies in place to clarify potential logistical, behavioral, and emotional variables that may ultimately help to improve care. Given the incidence and prevalence of gynecological pathology in HIV-infected women and the importance of early screening for detection of pathology, it will be critical to create appropriate interventions that target barriers to receiving gynecological healthcare among women enrolled in urban HIV clinics.

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References

- Centers for Disease Control and Prevention (CDC) Divisions of HIV/AIDS Prevention. HIV/AIDS among women. Department of Health and Human Services, June 2007. Available at www.cdc.gov/hiv/topics/women/resources/factsheets/women.htm
- Maryland Department of Health and Mental Hygiene (MDHMH) AIDS Administration. 2005 HIV/AIDS annual report. Available at www.dhmm.state.md.us/AIDS/Data&Statistics/statistics.htm
- Frankel RE, Selwyn PA, Mezger J, Andrews S. High prevalence of gynecologic disease among hospitalized women with human immunodeficiency virus infection. *Clin Infect Dis* 1997;25:706–712.
- Korn AP. Gynecologic care of women infected with HIV. *Clin Obstet Gynecol* 2001;44:226–242.
- Cejtin HE. Gynecologic issues in the HIV-infected woman. *Obstet Gynecol Clin North Am* 2003;30:711–729.
- Jamieson DJ, Paramsothy P, Cu-Uvin S, Duerr A. Vulvar, vaginal, and perianal intraepithelial neoplasia in women with or at risk for HIV. *Obstet Gynecol* 2006;107:1023–1028.
- Uphold CR, Mkanta WN. Review: Use of health care services among persons living with HIV infection: State of the science and future directions. *AIDS Patient Care STDs* 2005;19:473–485.
- Lachance JA, Everett EN, Greer B, et al. The effect of age on clinical/ pathologic features, surgical morbidity, and outcome in patients with endometrial cancer. *Gynecol Oncol* 2006;101:470–475.
- Gichangi P, De Vuyst H, Estambale B, et al. HIV and cervical cancer in Kenya. *Int J Gynecol Obstet* 2002;76:55–63.
- Smith RA, Saslow D, Sawyer KA, et al. American Cancer Society screening guidelines for breast cancer screening: Update 2003. *CA Cancer J Clin* 2003;53:141–169.
- Minkoff HL, Eisenberger-Matityahu D, Feldman J, Burk R, Clark L. Prevalence and incidence of gynecologic disorders among women infected with human immunodeficiency virus. *Am J Obstet Gynecol* 1999;180:824–836.
- Ellerbrock TV, Chiasson MA, Bush TJ, et al. Incidence of cervical squamous intraepithelial lesions in HIV-infected women. *JAMA* 2000;283:1031–1037.
- Stein MD, Cunningham WE, Nakazono T, et al. HCSUS Consortium: Screening for cervical cancer in HIV-infected women receiving care in the United States. *J AIDS* 2001;27:463–466.
- Maiman M, Fruchter RG, Sedlis A, et al. Prevalence, risk factors, and accuracy of cytologic screening for cervical intraepithelial neoplasia in women with the human immunodeficiency virus. *Gynecol Oncol* 1998;68:233–239.
- Anderson JR, Paramsothy P, Heilig C, et al. HIV Epidemiology Research (HER) Study Group: Accuracy of Papanicolaou test among HIV-infected women. *Clin Infect Dis* 2006;42:562–568.
- Duerr A, Paramsothy P, Heilig C, et al. HIV Epidemiology Research Study: Effect of HIV infection on atypical squamous cells of undetermined significance. *Clin Infect Dis* 2006;42:855–861.
- Lillo FB, Ferrari D, Veglia F, et al. Human papillomavirus infection and associated cervical disease in human immunodeficiency virus-infected women: Effect of highly active antiretroviral therapy. *J Infect Dis* 2001;184:547–551.
- Minkoff HL, Ahdieh L, Massad LS, et al. The effect of highly active antiretroviral therapy on cervical cytologic changes associated with oncogenic HPV among HIV-infected women. *AIDS* 2001;15:2157–2164.
- Keiser O, Tejada BM, Wunder D, et al. Frequency of gynecologic follow-up and cervical cancer screening in the Swiss HIV Cohort Study. *J AIDS* 2006;43:550–555.
- Solomon L, Stein M, Flynn C, et al. Health services use by urban women with or at risk for HIV-1 infection: The HERS Study. *J AIDS* 1998;17:253–261.

21. Cejtin HE, Komaroff E, Massad LS, et al. Adherence to colposcopy among women with HIV infection. *J AIDS* 1999;22: 247–258.
22. Baltimore City Health Department. Ryan White Title I Office Quality Improvement Program Primary Health Care Review 2006—Data presented January 2007.
23. National Institutes of Health Consensus Development Panel. Cervical cancer. *NIH Consensus Statement* 1996;14:1–38.
24. Benard VB, Lawson HW, Ehemann CR, Anderson C, Helsel W. Adherence to guidelines for follow-up of low-grade cytologic abnormalities among medically underserved women. *Obstet Gynecol* 2005;105:1323–1328.
25. Jennings-Dozier K. Perceptual determinants of Pap test up-to-date status among minority women. *Oncol Nurs Forum* 1999;26:1327–1333.
26. Bazargan M, Bazargan SH, Farooq M, Baker RS. Correlates of cervical cancer screening among underserved Hispanic and African-American women. *Prev Med* 2004;39:465–473.
27. Owusu G, Eve S, Cready C, et al. Race and ethnic disparities in cervical cancer screening in a safety-net system. *Matern Child Health J* 2005;9:285–295.
28. Heckman TG, Somlai AM, Peters J, et al. Barriers to care among persons living with HIV/AIDS in urban and rural areas. *AIDS Care* 1998;10:365–375.
29. Cohen MH, Cook JA, Grey D, et al. Medically eligible women who do not use HAART: The importance of abuse, drug use, and race. *Am J Public Health* 2004;94:1147–1151.
30. Andersen M, Tinsley J, Milfort D, et al. HIV health care access issues for women living with HIV, mental illness, and substance abuse. *AIDS Patient Care STDs* 2005;19:449–459.
31. Hicks PL, Mulvey KP, Chander G, et al. The impact of illicit drug use and substance abuse treatment on adherence to HAART. *AIDS Care* 2007;19:1134–1140.
32. Hinkin CH, Barclay TR, Castellon SA, et al. Drug use and medication adherence among HIV-infected individuals. *AIDS Behav* 2007;11:185–194.
33. Wyatt GE, Carmona JV, Loeb TB, Williams JK. HIV-positive black women with histories of childhood sexual abuse: Patterns of substance use and barriers to health care. *J Health Care Poor Underserved* 2005;16:9–23.
34. Shapiro MF, Morton SC, McCaffrey DF, et al. Variations in the care of HIV-infected adults in the United States. *JAMA* 1999;281:2305–2315.
35. Ojikutu BO, Stone V. Women, inequality, and the burden of HIV. *N Engl J Med* 2007;352:649–652.
36. Cunningham WE, Andersen RM, Katz MH, et al. The impact of competing subsistence needs and barriers to access to medical care for persons with HIV receiving care in the United States. *Med Care* 1999;37:1270–1281.
37. Schuster MA, Collins R, Cunningham WE, et al. Perceived discrimination in clinical care in a nationally representative sample of HIV-infected adults receiving health care. *J Gen Intern Med* 2005;20:807–813.
38. Beach MC, Keruly J, Moore R. Is the quality of the patient-provider relationship associated with better adherence and outcomes for patients with HIV? *J Gen Intern Med* 2006;21: 661–665.
39. Fuertes J, Mislowack A, Bennet J, et al. The physician-patient working alliance. *Patient Educ Couns* 2007;66: 9–36.
40. Austin L, Ahmad F, McNally M, et al. Breast and cervical cancer screening in Hispanic women: A literature review using the Health Belief Model. *Womens Health Issues* 2002; 12:122–128.
41. Byrd T, Chavez R, Wilson K. Barriers and facilitators of cervical cancer screening among Hispanic women. *Ethn Dis* 2007;17:129–134.
42. Burak L, Myer M. Using the Health Belief Model to examine and predict college women's cervical cancer screening beliefs and behavior. *Health Care Women Int* 1997;18:251–662.

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