

Perspectives

Role of the Provider in Prevention of HIV Infection and Elimination of Tuberculosis and Syphilis

The role of the primary care provider in improving HIV disease prevention and contributing to elimination of tuberculosis and syphilis was discussed by Michael P. Johnson, MD, MPH, at the 4th Annual HIV Clinical Conference for Ryan White Title III and IV providers in San Diego in June, 2001. The conference was sponsored by the International AIDS Society–USA and supported by the HIV/AIDS Bureau of the US Health Resources and Services Administration.

Primary care providers to persons with HIV disease play a pivotal role in prevention and treatment of HIV infection and related diseases and conditions. National efforts are underway to emphasize and support HIV primary care providers in preventing transmission of HIV, as well as to promote goals in the elimination of tuberculosis and syphilis. Recent disease-specific recommendations have been formulated by the Institute of Medicine in 2 studies—*No Time to Lose: Getting More From HIV Prevention* and *Ending Neglect: The Elimination of Tuberculosis in the United States*—and by the Centers for Disease Control and Prevention (CDC) in *The National Plan to Eliminate Syphilis from the United States*. It is likely that few of the specific recommendations in these studies and plans are unknown to clinicians. However, many of the recommendations are not always followed in busy clinical practice settings and need to be more rigorously implemented if dramatic reductions in these infections are to be achieved.

Dr Johnson is Director of the Division of Training and Technical Assistance, and Chief Medical Officer, HIV/AIDS Bureau, Health Resources and Services Administration, Rockville, Maryland.

HIV Prevention

Our Patients Are Having Sex and Using Drugs

For much of the HIV epidemic in the United States, prevention interventions have been focused on uninfected individuals. As prevention efforts have evolved, there has been increasing emphasis on prevention in high-risk individuals and, more recently, increasing attention to interventions targeting HIV-infected individuals in clinical care. The high and increasing levels of risk behavior in high-risk and HIV-infected patients documented in many recent studies point out the need to redouble prevention efforts in these populations.

A 4-city study of men who have sex with men (MSM) showed a generally steady increase in numbers of cases of gonorrhea between 1995 and 1999 (Figure 1; Fox et al, *Am J Public Health*, 2001). A study of risk behavior among 293 MSM in 5 cities reported this year showed that 93% had sex within the past 6 months, 43% had unprotected sex

within the past 6 months, 29% were known to be HIV-seropositive, 23% were in regular medical care, and 18% were taking antiretroviral therapy (Valleroy et al, 8th CROI, 2001). A study conducted in 317 women and 361 men with HIV infection at a Baltimore sexually transmitted disease (STD) clinic in 1997 and 1998 found that 56% of women and 60%

A related article, "Approaches to HIV Prevention Among Seropositive Patients in the Clinical Care Setting," was published in the July, 2001, issue of *Topics in HIV Medicine*.

of men had had sex within the past 90 days; 7% and 14%, respectively, had had sex with a new partner in the past 90 days; and 64% and 67%, respectively, reported condom use in the last sexual encounter (Erbelding et al, *AIDS*, 2000).

Data for 1993 through 1998 from 354 women and 796 men at the Baltimore clinic show that 12% of women and 14% of men had a new STD after receiving

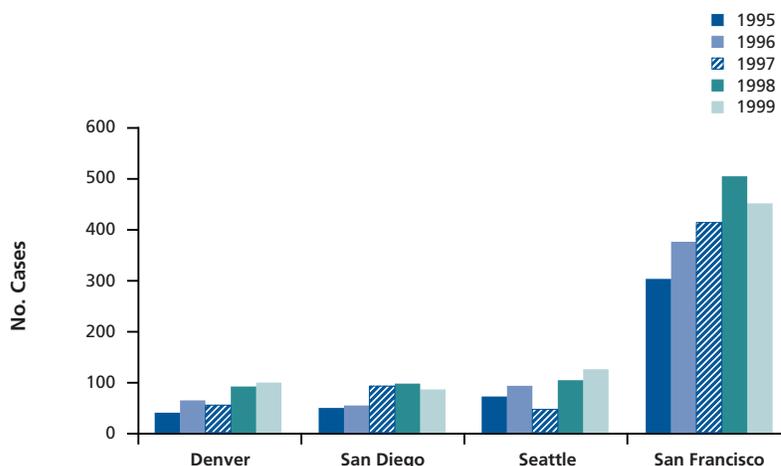


Figure 1. Cases of gonorrhea from 1995 to 1999 among men who have sex with men. Adapted with permission from Fox et al, *Am J Public Health*, 2001.

diagnosis of HIV infection, including gonorrhea (3% and 5%), syphilis (3% and 1%), and trichomonas and/or nongonococcal urethritis (8% and 8%; Erbeling et al, *Int J STD AIDS*, 2001). A 1999 study of HIV-infected individuals in Atlanta found that among 112 women and 228 men, 16% and 11%, respectively, had an STD within the past 3 months, including gonorrhea (6% and 4%), chlamydia (4% and 3%), and syphilis (4% and 3%). Thirty-one percent and 13%, respectively, had STD symptoms without diagnosis in the past 3 months, and 36% and 18%, respectively, had an STD or STD symptoms over that period (Kalichman et al, *Sex Transm Infect*, 2001). Among this group of HIV-infected persons, the occurrence of STDs (diagnosed by laboratory diagnosis and/or symptoms suggestive of an STD) was positively correlated with sexual risk behaviors (numerous partners, no condom use) and use of drugs.

Another study assessing changes in behavior among individuals recently diagnosed with HIV infection showed that at 1 year after diagnosis, 58% used recreational drugs compared with 84% at time of diagnosis (baseline), 50% of MSM reported more than 5 sex partners in the past 6 months versus 74% at baseline, and 44% of MSM reported having public sex versus 63% at baseline (Sey et al, 8th CROI, 2001). A 1998 report of drug use among HIV-infected injection drug users in a 12 state and city health department study from 1990 to 1995 showed that 786 of 1527 study participants had injected drugs within the past year, with 391 sharing syringes during that time (Diaz et al, *J Acquir Immune Defic Synd Hum Retrovirol*, 1998).

We Are Not Talking Enough To Our Patients About Sex and Drugs

The high prevalence of risk behaviors among HIV-infected persons despite ongoing involvement of many in medical care raises the question of whether more can be made of the opportunity to influence behavior during ongoing medical care contacts. A variety of data indicate, however, that risk screening and education are not routine elements of care in the clinical setting. In a 2000 study of 74 HIV care providers in Seattle, all clients were asked about sexual

behaviors, STD history, and current drug use by only 32%, 18%, and 47% of providers, respectively. Sexual risk reduction, STD risk reduction, and drug use risk reduction were discussed with

In a study of 44
HIV care providers in
San Francisco in
1996-1997, only
12% reported
routinely conducting
risk behavior discussions

all clients by only 26%, 19%, and 28% of providers, respectively (Jeff Natter, personal communication). In a 2000 study of 63 providers of HIV clinical care in 4 major cities, 56% reported discussing prevention at every visit or most visits, 72% provided prevention counseling to new patients, and only 19% provided prevention counseling to established patients.

A 1996 to 1997 study of 44 physicians in San Francisco with extensive experience in treating HIV-infected patients found that the issue of HIV prevention was revisited in response to a medical cue (eg, STD) by 44% of physicians, patient report of change in relationship by 36%, and doubt about patient report of behavior by 12%. Twelve percent of physicians indicated that they routinely conducted risk behavior discussions (Gerbert et al, *AIDS Education Prev*, 1999). In a study of 49 HIV-seropositive patients from 2 Ryan White CARE Act-funded clinics who were interviewed as they were leaving a clinic visit, 61% reported being sexually active, 23% reported being concerned about transmitting HIV in the past year, 57% had been counseled about safer sex in the past year, and 4% had been counseled about HIV transmission during the current clinic visit (Steve Morin, personal communication).

Can We Do More to Assess Risk and Intervene?

Definitive data on the effectiveness of risk screening and prevention interventions are lacking. However, data indicating the benefit of counseling are accumulating. For example, a randomized controlled study conducted at 5 clinical sites serving persons at high risk for HIV from 1993 to 1996 showed that both extended behavioral client-centered counseling and brief client-centered counseling were associated with a reduction in incidence of STDs of approximately 20% to 30% compared with provision of didactic prevention information over 12 months (Figure 2; Kamb et al, *JAMA*, 1998). These findings suggest that brief counseling in the clinic setting may be a feasible approach to prevention.

Other studies have examined approaches to risk screening. One study showed that use of a computer-assisted self-interview technique was more likely than personal interview to elicit "yes" answers to questions about engaging in socially undesirable behaviors, particularly among women and youths (Kissinger et al, *Am J Epidemiol*, 1999). A similar, but nonsignificant, trend was observed using a similar approach in another recent study (Gerbert et al, *Med Care*, 1999). The latter study showed no effect of reporting of risk behaviors according to whether patients were told that their provider would or would not be informed of their report, suggesting that the provider's knowledge of risk behavior may not be a disincentive to reporting.

Small studies have indicated a benefit of training of providers using simulated patients to improve the frequency of risk screening and risk reduction counseling. In one study, use of a simulated HIV-infected patient for training had a beneficial effect on HIV risk screening practices among 65% of the providers studied (Epstein et al, *J Gen Intern Med*, 2001). In another study, this technique increased the frequency of STD risk reduction counseling to 73% of client encounters, as compared with 42% of encounters in a control arm and 53% among providers who received educational materials alone (Rabin et al, *Ann Intern Med*, 1994).

There are a number of ongoing studies examining approaches to HIV prevention that may contribute substantially to optimizing prevention efforts. These include the CDC/Health Resources and Services Administration (HRSA) Prevention for HIV-Infected Persons Project, multisite intervention studies of the National Institute for Mental Health (eg, the Partnership for Health Project), and the HRSA Center for AIDS Prevention multisite study of prevention practices among Ryan White CARE Act-funded clinics. It is hoped that results will guide the development and refinement of evidence-based prevention interventions for HIV-infected persons.

In the meantime, guidelines for screening and prevention based on expert opinion exist. A 1996 document from the American Medical Association and Kaiser Family Foundation suggests approaches to sexual risk screening, injection drug use risk screening, and prevention planning (available at <http://www.ama-assn.org/special/hiv/treatmnt/guide/hivguide/hivguide.htm>). New guidelines currently are being developed jointly by the CDC, HRSA, and Infectious Diseases Society of America, and are expected to be available in late 2001. These guidelines will include recommendations for risk screening, behavioral intervention, and partner notification.

Partner notification is often performed in collaboration with health departments. Evidence for the effectiveness of this approach comes from a 1992 study in which partner notification was more effective when performed by a health department (78 partners of 39 HIV-infected patients notified) compared with notification by HIV-infected patients (10 partners of 35 HIV-infected patients notified; Landis et al, *N Engl J Med*, 1992). However, the recent experience of Jordan and colleagues (Wilbert Jordan, personal communication) indicates that patients can be effective in partner notification as well. The use of patient incentives, such as movie passes, led to HIV testing in 192 partners and contacts of 76 HIV-infected patients, 103 (53%) of whom were found to be HIV-seropositive. This remarkably high rate of HIV infection suggests that motivated patients might be best able to select

partners and other individuals at high risk for HIV infection for referral to HIV testing and care.

One important aspect of HIV prevention that is just beginning to be investigated and understood is the effect of antiretroviral therapy on risk behavior.

Two recent studies reported an association between use of antiretroviral therapy and increased risk behavior

Available data indicate that risk of transmission is greatly reduced with effective viral suppression on antiretroviral therapy, with an approximately 2.5% increase in risk of transmission with each log-increase in viral load (Quinn et al, *N Engl J Med*, 2000). However, that risk is reduced but likely not eliminated even at plasma viral loads of less than 400

HIV-1 RNA copies/mL because of the occurrence of discordance between serum viral load and that in genital secretions. There is considerable concern that the belief that antiretroviral therapy will prevent transmission leads to increased risk behavior. Two recent articles have reported such an effect, with one group in San Francisco finding a 4-fold increase in risk of STD in association with use of potent antiretroviral therapy (Scheer et al, *Lancet*, 2001) and a group in Amsterdam finding an association between achievement of viral load below the limit of detection on potent therapy and a 3-fold increased risk of unprotected sex with casual partners (Dukers et al, *AIDS*, 2001).

Moreover, other data suggest that increased risk behavior may be associated with reduced adherence to antiretroviral medication (Flaks et al, 8th CROI, 2001). In one study, 38 patients with no reported risk behavior exhibited 92% adherence, and 35% of this group had a viral load level below 50 copies/mL. Among 36 patients with a low level of risk behavior, 80% were adherent and 26% had a viral load below 50 copies/mL. Finally, among 21 patients with a high level of risk behavior, 74% were adherent, with 9% having viral load below 50 copies/mL. Such findings

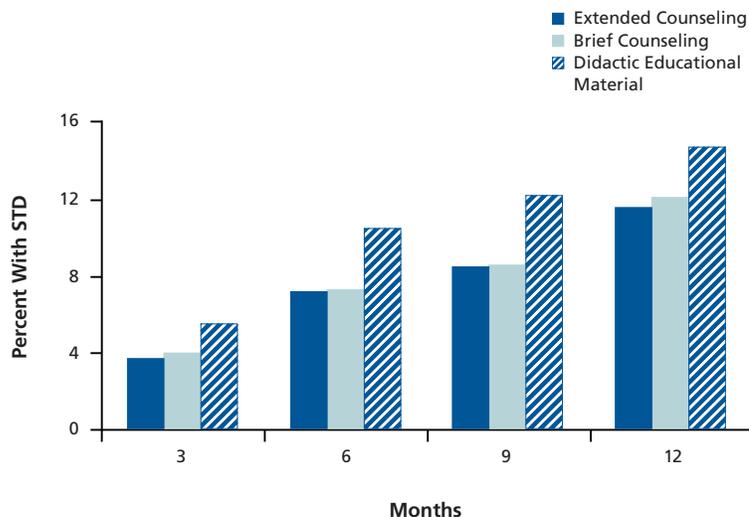


Figure 2. Proportions of individuals with a new sexually transmitted disease (STD) from 1993 to 1996 at clinics in Baltimore, Md; Denver, Colo; Long Beach, Calif; Newark, NJ; and San Francisco, Calif, according to whether they had received extended counseling, brief counseling, or didactic educational material alone. Adapted from Kamb et al, *JAMA*, 1998.

emphasize that good treatment practices include not only providing antiretroviral therapy according to guidelines, but ensuring that patients are counseled with regard to the potential for developing a false security about risk behaviors during treatment.

Tuberculosis Elimination

The Institute of Medicine target case rate for tuberculosis elimination (to be distinguished from eradication, which represents complete absence of disease) is less than 0.1 case per 100,000 population. The current case rate in the United States is 6.4 cases per 100,000 population. Tuberculosis rates declined by approximately 39% between 1992 and 1999 (Figure 3), after the increase in the late 1980s and early 1990s that was associated with both HIV disease and the reduced resources available to tuberculosis management infrastructure. Preliminary data indicate a further 7% decrease between 1999 and 2000. During this decline, cases in foreign-born persons have accounted for an increasing proportion of total cases, including 46% of new cases in 2000. Clinicians treating patients with HIV disease confront a case rate among their patients that is 50-fold greater than the national rate, with cases among patients with HIV disease accounting for approximately 5% of cases in this country.

Key elements of the elimination strategy proposed by the Institute of Medicine include (1) maintaining control of tuberculosis by improving treatment of active disease while adapting to declining disease incidence and changes in systems of health care financing and management, (2) speeding the decline in case rate through increased efforts related to targeted tuberculin skin testing and treatment of latent infection, (3) developing new tools for the diagnosis and treatment of and vaccination against tuberculosis, (4) increasing US involvement in global tuberculosis control, and (5) mobilizing support for and measuring progress toward tuberculosis elimination.

Care providers can contribute to the elimination of tuberculosis by maintaining practice patterns that are consistent with current recommendations for treatment of active disease, by targeted

screening of persons at high risk for tuberculosis, including those with HIV infection, and by treatment of latent tuberculosis infection. Recommendations for these clinical interventions exist and are regularly updated. It is important to note that several of these recommendations, such as those concerning drug choices based on drug interactions, interpretation of skin testing results, and monitoring of adverse drug effects differ between HIV-infected and uninfected persons. They can be accessed in print versions (CDC, MMWR, 1998; CDC, MMWR, 2000; American Thoracic Society/CDC, MMWR, 2000) and on the CDC Division of Tuberculosis Elimination Web site (<http://www.cdc.gov/nchstp/tb>). They can also be accessed on the Web sites of the 3 model centers for tuberculosis research and education: the National Tuberculosis Center at the University of Medicine and Dentistry of New Jersey (<http://www.umdnj.edu/ntbcweb>), the Charles P. Felton National Tuberculosis Center at Harlem Hospital (<http://www.harlemtbcenter.org>), and the Francis J. Curry National Tuberculosis Center at the University of California San Francisco (<http://www.nationaltbcenter.edu>). Both the CDC and the model centers also have free educational and teaching materials that are easily accessed by telephone, mail, or Internet. Finally, HIV care providers should maintain close working relationships with

tuberculosis control experts in local health departments who can assist with clinical recommendations and client referral.

Elimination of Syphilis

The target specified in *The National Plan to Eliminate Syphilis from the United States* is a reduction of the number of annual cases to 1000 or fewer (or less than 4 cases per 1 million population) and an increase in the proportion of syphilis-free counties to 90% or greater by 2005. The local definition is absence of transmission of new cases within the jurisdiction except within 90 days of report of an imported case. For 1999, a total of 6657 primary or secondary cases were reported, with 79% of counties (2473 of 3115) reporting no cases. Less than 1% of counties accounted for more than 50% of cases, with most of these counties being in the southeastern United States. Since the early 1990s, there has been a consistent decline in the huge epidemic of syphilis among African Americans. Despite declines in all age groups, rates of disease in 15- to 19-year-old men and women are still more than 30 times higher than in the corresponding white populations (Figure 4).

The National Syphilis Elimination Plan has 5 key elements: (1) enhanced surveillance, (2) strengthened community involvement and partnership, (3) rapid outbreak response, (4) expanded

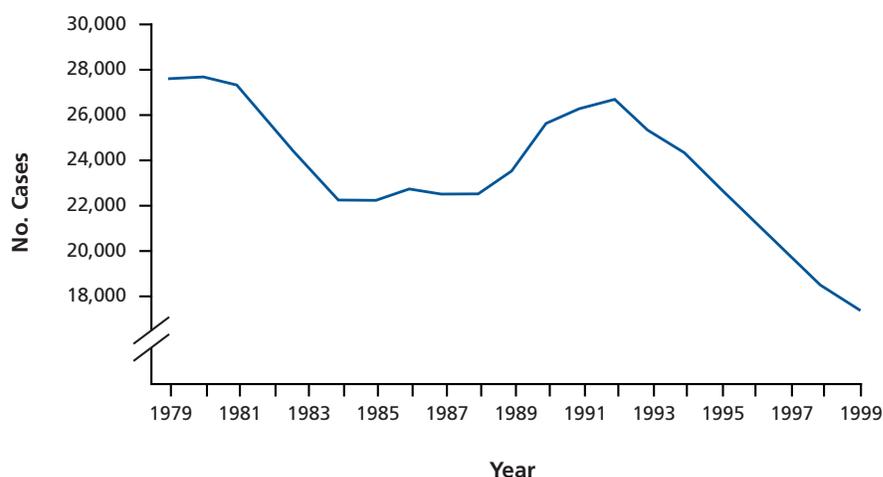


Figure 3. Reported tuberculosis cases in the United States, 1979 to 1999. Adapted from the Centers for Disease Control and Prevention; available at: <http://www.cdc.gov/nchstp/tb>.

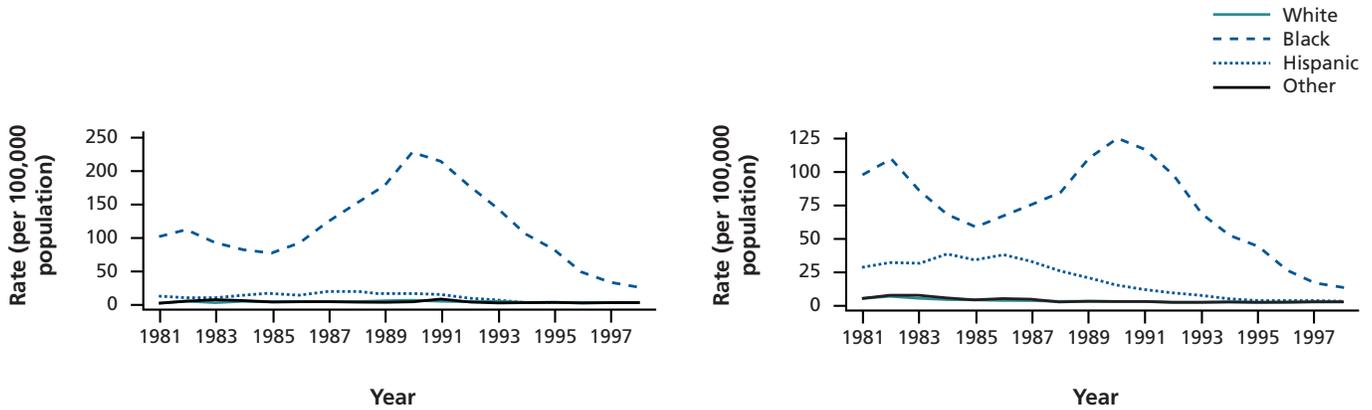


Figure 4. Reported rates of primary and secondary syphilis among 15- to 19-year-old women (left) and men (right) in the United States, 1981 to 1998. Persons included in "black," "white," and "other" categories were non-Hispanic. Adapted from the Centers for Disease Control and Prevention; available at: <http://www.cdc.gov/nchstp/dstd/dstdp.html>.

clinical and laboratory services, and (5) enhanced health promotion. Providers can play pivotal roles in all of these strategies, but have most obvious roles in providing clinical services and enhancing health promotion. Providers should assess high-risk sexual behavior, deliver client-centered prevention messages, link with local health departments for follow-up and contact tracing, and maintain current clinical practices regarding the diagnosis and treatment of syphilis.

Specific recommendations for diagnosis and treatment of syphilis are available (CDC, MMWR, 1998; <http://www.cdc.gov/nchstp/dstd/dstdp.html>). These include information on the clinical presentation of syphilis in HIV-infected persons, interpretation of serologic tests (for diagnosis and for evaluation of the effectiveness of treatment), evaluation for neurosyphilis, treatment (including that for penicillin-allergic patients), and recommendations for follow-up after treatment. Certain issues are specific to HIV-infected persons, particularly the range and rapidity of the development of clinical signs and symptoms following syphilis infection, index of suspicion and evaluation for neurosyphilis, and more intensive follow-up with serologic testing after treatment.

Summary

Providers of care for HIV-infected persons can and must play prominent roles

in the prevention of HIV infection and elimination of tuberculosis and syphilis by (1) being aware of and practicing according to updates in prevention, screening, and treatment guidelines; (2) sharing knowledge regarding effective prevention and screening with others; (3) establishing referral and reporting linkages with experts in local health departments; (4) documenting activities for the prevention, screening, and treatment of these illnesses; and (5) including the evaluation of these prevention and elimination activities as part of quality improvement activities.

Presented in June, 2001; reviewed and updated by Dr Johnson in September, 2001.

Grant Support and Financial Disclosure: Dr Johnson has no affiliations with commercial organizations that may have interests related to the content of this article.

Suggested Reading

HIV Prevention

American Medical Association/Henry J. Kaiser Family Foundation. *A Physician Guide to HIV Prevention*. June, 1996. Available at: <http://www.ama-assn.org/special/hiv/treatment/guide/hivguide/hivguide.htm>. Accessed September 26, 2001.

Auerbach JD, Coates TJ. HIV prevention research: accomplishments and challenges for the third decade of AIDS. *Am J Public Health*. 2000;90:1029-1032.

Diaz T, Chu SY, Weinstein B, Mokotoff E, Jones TS. Injection and syringe sharing among HIV-infected

injection drug users: implications for prevention of HIV transmission. Supplement to HIV/AIDS Surveillance Group. *J Acquir Immune Defic Syndr Hum Retrovirol*. 1998;18(suppl 1):S76-S81.

Dukers NH, Goudsmit J, de Wit JB, Prins M, Weverling GJ, Coutinho RA. Sexual risk behaviour relates to the virological and immunological improvements during highly active antiretroviral therapy in HIV-1 infection. *AIDS*. 2001;15:369-378.

Epstein RM, Levenkron JC, Frarey L, Thompson J, Anderson K, Franks P. Improving physicians' HIV risk-assessment skills using announced and unannounced standardized patients. *J Gen Intern Med*. 2001;16:176-180.

Erbelding EJ, Chung S, Nwokolo E, Rompalo AM. New sexually transmitted diseases in HIV-infected patients after post-test counseling. *Int J STD AIDS*. 2001;12(suppl 2):163.

Erbelding EJ, Stanton D, Quinn TC, Rompalo A. Behavioral and biologic evidence of persistent high-risk behavior in an HIV primary care population. *AIDS*. 2000;14:297-301.

Flaks R, Burman W, Gourley P, Rietmeijer C, Bull S, Cohn D. Unsafe sex among persons in HIV care is associated with decreased adherence with antiretroviral therapy. [Abstract 214.] 8th Conference on Retroviruses and Opportunistic Infections. February 4-8, 2001; Chicago, Ill.

Fox KK, del Rio C, Holmes KK, et al. Gonorrhoea in the HIV era: a reversal in trends among men who have sex with men. *Am J Public Health*. 2001;91:959-964.

Gerbert B, Bronstone A, Pantilat S, McPhee S, Allerton M, Moe J. When asked, patients tell: disclosure of sensitive health-risk behaviors.

Med Care. 1999;37:104-111.

Gerbert B, Brown B, Volberding P, et al. Physicians' transmission prevention assessment and counseling practices with their HIV positive patients. *AIDS Educ Prev.* 1999;11:307-320.

Institute of Medicine. *No Time to Lose: Getting More from HIV Prevention.* Washington, DC: National Academy Press; 2000. Available at: <http://www.nap.edu/books/0309071372/html>. Accessed September 4, 2001.

Kalichman SC, Rompa D, Cage M. Sexually transmitted infections among HIV seropositive men and women. *Sex Transm Infect.* 2000;76:350-354.

Kamb ML, Fishbein M, Douglas JM, et al. Efficacy of risk-reduction counseling to prevent human immunodeficiency virus and sexually transmitted diseases: a randomized controlled trial. Project RESPECT Study Group. *JAMA.* 1998;280:1161-1167.

Kissinger P, Rice J, Farley T, et al. Application of computer-assisted interviews to sexual behavior research. *Am J Epidemiol.* 1999;149:950-954.

Landis SE, Schoenbach VJ, Weber DJ, et al. Results of a randomized trial of partner notification in cases of HIV infection in North Carolina. *N Engl J Med.* 1992;326:101-106.

Quinn TC, Wawer MJ, Sewankambo N, et al. Viral load and heterosexual transmission of human immunodeficiency virus type 1. Rakai Project

Study Group. *N Engl J Med.* 2000;342:921-929.

Rabin DL, Boekeloo BO, Marx ES, Bowman MA, Russell NK, Willis AG. Improving office-based physicians' prevention practices for sexually transmitted diseases. *Ann Intern Med.* 1994;121:513-519.

Scheer S, Chu PL, Klausner JD, Katz MH, Schwartz SK. Effect of highly active antiretroviral therapy on diagnoses of sexually transmitted diseases in people with AIDS. *Lancet.* 2001;357:432-435.

Sey K, Harawa N. High-risk behavior among individuals diagnosed with acute/primary or recent HIV infection. [Abstract 216.] 8th Conference on Retroviruses and Opportunistic Infections. February 4-8, 2001; Chicago, Ill.

Valleroy L, Secura G, MacKellar D, Behel S, Young Men's Survey Study Group. High HIV and risk behavior prevalence among 23- to 29-year-old men who have sex with men in 6 US cities. [Abstract 211.] 8th Conference on Retroviruses and Opportunistic Infections. February 4-8, 2001; Chicago, Ill.

Tuberculosis Elimination

American Thoracic Society/Centers for Disease Control and Prevention Statement Committee on Latent Tuberculosis Infection. Targeted tuberculin testing and treatment of latent tuberculosis infection. *MMWR Morb Mortal Wkly Rep.* 2000;49:1-54.

Centers for Disease Control and Prevention.

Notice to readers: updated guidelines for the use of rifabutin or rifampin for the treatment and prevention of tuberculosis among HIV-infected patients taking protease inhibitors or nonnucleoside reverse transcriptase inhibitors. *MMWR Morb Mortal Wkly Rep.* 2000;49:185-189.

Centers for Disease Control and Prevention. Prevention and treatment of tuberculosis among patients infected with human immunodeficiency virus: principles of therapy and revised recommendations. *MMWR Morb Mortal Wkly Rep.* 1998;47:1-58.

Institute of Medicine. *Ending Neglect: The Elimination of Tuberculosis in the United States.* Washington, DC: National Academy Press; 2000. Available at: <http://www.nap.edu/catalog/9837.html>. Accessed September 4, 2001.

Syphilis Elimination

Centers for Disease Control and Prevention. *The National Plan to Eliminate Syphilis from the United States.* Available at: <http://www.cdc.gov/stopsyphilis/Plan.pdf>. Accessed June 1, 2001.

Centers for Disease Control and Prevention. Primary and secondary syphilis—United States, 1999. *MMWR Morb Mortal Wkly Rep.* 2001;50:113-117.

Centers for Disease Control and Prevention. 1998 guidelines for treatment of sexually transmitted diseases. *MMWR Morb Mortal Wkly Rep.* 1998;47:1-118.