Reducing the Risk of HIV Infection Associated With Illicit Drug Use

Committee on Pediatric AIDS

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POLICY STATEMENT

Reducing the Risk of HIV Infection Associated With Illicit Drug Use

Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of All Children

Committee on Pediatric AIDS

ABSTRACT

Substance abuse, specifically the use of illicit drugs that are administered intravenously, continues to play a role in the transmission of human immunodeficiency virus type 1 (HIV-1) among adolescents and young adults (youth). Risks of HIV-1 infection may result from direct exposure to contaminated blood through sharing of injection drug equipment and from unsafe sexual practices (while under the influence of drugs and/or in exchange for drugs). Reducing the risk of HIV-1 infection that is associated with illicit drug use requires prevention education and prompt engagement in treatment. Providing patients with education, instruction on decontamination of used injection drug equipment, improved access to sterile syringes and needles, and postexposure prophylaxis may decrease their risk of acquiring HIV-1 infection. Pediatricians should assess risk behaviors as part of every health care encounter, including queries about tobacco, alcohol, and marijuana use. The risks and benefits of postexposure prophylaxis with antiretroviral drugs should be considered for youth with a single recent (within 72 hours) high-risk exposure to HIV-1 through sharing needles/syringes with an HIV-1–infected individual or having unprotected intercourse with an individual who engages in injection drug use. Such prophylaxis must be accompanied by risk-reduction counseling, appropriate referrals for treatment, and evaluation for pregnancy and associated sexually transmitted infections. There is an urgent need for more substance-abuse prevention and treatment programs, legislation that facilitates unencumbered access to sterile syringes, and expedient availability of reproductive health care services for sexually active youth, including voluntary HIV-1 counseling and testing.

BACKGROUND

Illicit drug use continues to play a major role in the transmission of human immunodeficiency virus type 1 (HIV-1) in the United States. Injection drug users, men who have sex with men and engage in injection drug use, and heterosexuals who have sexual contact with an injection drug user were responsible for 23% of reported acquired immunodeficiency syndrome (AIDS) cases among adults and adolescents in 2003.[1] Among youth 13 to 24 years of age, these transmission categories accounted for 13.4% of AIDS cases in 2003. Of the approximately 40 000 new HIV-1 infections each year in the United States, an estimated 50% occur among individuals younger than 25 years.[2–4] The most common mode of acquisition of HIV-1 infection among youth is sexual contact. Young women 13 to 24 years of age are infected most often by heterosexual exposure to partners with HIV-1 infection. Heterosexual contact was reported by 52% of females as their primary risk factor for HIV-1 infection, and 15% reported "no identified risk"

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human immunodeficiency virus, HIV-1, adolescents, youth, substance abuse, injection drug use, postexposure prophylaxis, needle exchange

Abbreviation
PEP—postexposure prophylaxis

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because they did not know that their partner was infected with HIV-1.[3] Male-to-male sex accounts for 33% of HIV-1 infections in males 13 to 19 years of age and 62% of HIV-1 infections in males 20 to 24 years of age.[3] These young men commonly fail to disclose their sexual behavior for fear of rejection and alienation.[4] Of significant concern to public health officials and health care professionals is that these estimates may significantly underrepresent actual infections. Many youth have not been tested, and those who are aware of their HIV-1 infection status may not seek medical care, which poses a risk of unintended transmission and disease progression. For example, the prevalence of HIV-1 infection in a cohort of approximately 3500 young men who have sex with men in 7 US cities was found to be 7.2%. Approximately three fourths of these HIV-1–infected young men (15–22 years of age) were unaware of their HIV-1 serostatus.[5]

Risk factors for injection drug use may include tobacco, alcohol, and marijuana use[6–8] and depression.[9] Several recent studies have identified an association with illicit drug and alcohol use as well as high-risk sexual activity in youth who engage in body-modification practices, including tattoos, body piercing, and branding.[10–12] Drug dependence among youth also is associated with a history of childhood sexual abuse.[13]

There is a direct risk of HIV-1 transmission associated with sharing needles that are used to inject intravenous drugs or to apply tattoos and reusing tattoo ink(s). Youth may unintentionally put themselves at risk of acquiring HIV-1 by engaging in sexual activity while under the influence of illicit drugs or alcohol. In this scenario, youth may fail to use condoms and perhaps select particularly high-risk sexual partners.[14]

REDUCING THE RISK OF HIV-1 INFECTION ASSOCIATED WITH ILLICIT DRUG USE

Preventing and Treating Illicit Drug Use/Substance Abuse

The development and implementation of reproducible, efficacious strategies to prevent the onset of substance use is critical. These primary prevention efforts should begin early and be directed at children and adolescents who have not yet established a pattern of drug dependence or injection drug use. Initiatives should be coordinated and broadly based, with the involvement of families, schools, and community agencies including correction services/detention centers. At a community level, efforts also should be made to reach out to all youth. Homeless, runaway, and incarcerated youth are subpopulations that may be at higher risk. Pediatricians can and should take a leadership role in these initiatives. In clinical care settings, pediatricians should routinely assess patients for risk of substance use[15] and attendant comorbidities.[16] The HEADSS risk-assessment instrument[17] is one of a number[18] of useful approaches to identify substance abuse and other high-risk activities in adolescents. Even in the absence of current high-risk activities, pediatricians should discuss approaches that families can use to facilitate an interactive and ongoing dialogue regarding the use of illicit drugs, alcohol, and tobacco products[19]; the relationship of illicit drug use and unsafe sexual activity; and attendant health-related risks including the risk of HIV-1 acquisition.[20,21] Discussions of substance abuse[19] fit in appropriately with routine anticipatory guidance for adolescents, including discussions of sexuality,[22] sexual orientation,[23] condom use,[24] and contraception. These topics need to be discussed with a nonjudgmental approach,[20,23] with careful attention to local laws concerning confidentiality.[18,25,26] Pediatricians should also familiarize themselves with state laws that govern the delivery of medical services to minor youth.[18] Assurance of confidentiality is important to youth who may be reticent to share information regarding high-risk behaviors, depression, or sexual-identity concerns for fear of disclosure to parents. A confidentiality policy presented in the presence of youth and their parent(s) may encourage young people to share personal information more openly.[26]

Access to treatment programs is essential for youth with substance-abuse problems. Adolescent-specific programs are effective, but ongoing intervention is needed to avoid relapse.[27] Effective treatment for such youth is hampered by the dearth of available and affordable ambulatory and inpatient programs.[27,28] Of an estimated 1.4 million youth 12 to 17 years of age who required treatment for substance abuse in 2002, only 10% received services.[29] Only 7% of substance-abuse treatment centers provide services for individuals younger than 18 years.[29] The paucity of inpatient treatment facilities for substance abuse poses secondary risks of infection, untreated mental health issues, and academic failure. Such facilities need to be more readily accessible,[28] and treatment needs to be reimbursed adequately to ensure continued availability of services.[30] There also is a need to encourage medical insurance companies to provide adequate reimbursement to pediatricians who are willing to address substance-abuse problems in their practices.

Preventing Acquisition of HIV-1 Infection Among Those With a Substance-Abuse Problem

Education

Educational initiatives to reduce health risks that are associated with substance abuse should address all known drugs including alcohol and tobacco. Community-based programs can provide information to users of injection drugs and other illicit drugs about risky sexual behaviors that are linked to transmission and acquisition of HIV-1, the relationship between the exchange of sex for drugs and HIV-1 infection, and the protection to be gained from the proper use of condoms. Efforts should

be made to encourage cessation or reduction of illicit drug use, promote entry into substance-abuse treatment programs, to discourage the sharing of injection drug paraphernalia, to educate about safe sex practices, and to support access to mental health services. When helping youth with substance-abuse problems move into treatment, a nonconfrontational, empathetic approach is needed. Motivational enhancement therapy offers one such approach to helping youth accept care for substance-abuse problems.[15] The pediatrician can be an invaluable educational resource to youth-serving community-based organizations.

Decontamination of Used Injection Drug Equipment

A significant proportion of drug-dependent individuals are unwilling or unable to stop injection drug use and do not have access to new or sterile needles and syringes. Bleach disinfection of injection equipment is an important strategy to reduce the risk of HIV-1 infection from reusing or sharing needles and syringes when no safer options are available.[31] In a recent study of injection drug users, rinsing syringes with a 1:10 bleach solution (bleach to water) resulted in no recovery of viable HIV-1.[32] The disinfection procedure requires flushing the barrel of the syringe at least 2 times with a minimum of 30 seconds' exposure to the solution, followed by 1 to 2 rinses with clean water before reuse.[32]

Access to Sterile Syringes and Needles

The public health risks associated with shared use of injection drug paraphernalia have led many national and governmental entities not only to advocate for access to sterile syringes and needles but also to remove existing state laws that invoke criminal penalties for possession of injection drug equipment.[33] In many states, these laws have been crafted to provide a potentially legal safety net for physicians and pharmacists who prescribe or dispense needles and syringes. It is currently illegal for physicians to prescribe injection equipment for injection drug users in only 2 states: Delaware and Kansas. It is illegal for pharmacists to fill prescriptions for injection equipment for injection drug users in 4 states: Delaware, Kansas, Georgia, and Hawaii.[34]

In 2000, New Hampshire, New York, and Rhode Island adopted new syringe laws that partially or completely removed the requirement for a prescription to purchase syringes as well as legal penalties for syringe possession.[35] In Rhode Island, the prescription of syringes to patients who are injection drug users is provided in concert with an agreement to document this care in the medical record, to make syringe prescription a part of the patient's ongoing medical care, to include other harm-reduction strategies in the patient's care, to assist patients in disposing of used syringes safely, and to notify the pharmacy at the time of initial prescription.[36] That program seems to be associated with reductions in injection drug use risk behavior.[36] Such programs should be considered in other states.

Initiatives with the singular objective of increasing access to sterile injection drug equipment remain controversial, because they do not directly address the causes and broader consequences of injection drug use. Despite mounting evidence to counter concerns of escalating injection drug use resulting from unencumbered access to sterile equipment, the controversy remains an impediment for some states and cities to enact legislation to provide this service. Syringe-exchange programs reduce the risk of HIV-1 acquisition from use of shared needles,[37,38] and their association with other counseling and HIV-1 risk-reduction services leads to reduction of high-risk sexual behaviors as well, further enhancing the effectiveness of such programs to limit the spread of HIV-1 among those who engage in injection drug use as well as their sexual partners.[39,40] Syringe-exchange programs do not lead to an increase in injection drug use,[41] nor do they lead to formation of social networks that might enhance transmission of HIV-1 and other diseases.[42] Although prospective, randomized, controlled trials have not been feasible and not all programs have been able to demonstrate a protective effect against the spread of HIV-1 infection, the number of studies that have demonstrated benefits from needle-exchange programs, particularly those conducted within the context of comprehensive drug treatment, is now sufficient to support efforts to make such programs more widely available.[43]

Access to sterile equipment is most likely to be successful in reducing the risk of HIV-1 transmission if it operates in the context of a comprehensive program that provides counseling, opportunities to be engaged in prevention education, and opportunities to receive health care services and if it emphasizes treatment. The provision of clean needles and syringes to injection drug users who have access to treatment but are unwilling or unable to enter treatment or remain abstinent while in treatment may reduce the acquisition or transmission of HIV-1 infection. Syringe-exchange programs are currently available in 31 states, the District of Columbia, and Puerto Rico. Referral to substance-abuse programs was provided by 95% of the syringe-exchange programs. Injection drug users who are referred to substance-abuse treatment programs by syringe-exchange programs have short-term outcomes comparable to those referred by other resources.[34]

Postexposure Prophylaxis

In situations in which an HIV-1–uninfected adolescent has a single recent exposure (within 72 hours) to HIV-1 from sharing injection drug equipment with an HIV-1–infected individual, some experts will consider providing postexposure prophylaxis (PEP).[44] The risk of HIV-1 transmission for each episode of needle or syringe exposure is estimated at 0.67%. Pediatricians should be able

to provide their patients who have an at-risk exposure through injection drug use access to a system for prompt evaluation, counseling, and possible PEP.[45] However, for adolescents who continue needle sharing and, thus, potentially expose themselves to HIV-1, PEP is not routinely recommended, and behavioral interventions to reduce repeated exposure are more appropriate. Current US Public Health Service guidelines include consideration of PEP with combination antiretroviral therapy in patients after injection drug use if the likelihood of shared needles between an HIV-1–uninfected and HIV-1–infected person is significant, the event is sporadic rather than frequent, and combination antiretroviral therapy is begun within 72 hours of exposure.[46] PEP might also be considered for sexual exposure to an HIV-1–infected individual who engages in injection drug use. Additional information regarding PEP among pediatric and adolescent patients can be obtained from a recent AAP clinical report.[47] If PEP is provided, it is critical that risk-reduction counseling related to injection drug use and referral to appropriate substance-abuse treatment be provided concomitantly. Youth with possible percutaneous HIV-1 exposure attributable to injection drug use also should be assessed for hepatitis B and hepatitis C virus infection and, if not previously fully immunized, given hepatitis B vaccine.

CONCLUSIONS AND RECOMMENDATIONS

The transmission of HIV-1 is one of many adverse consequences of illicit drug use. Initiatives to reduce the risk of HIV-1 transmission should include the following.

1. Engaging youth in care
   - Engagement of a youth in his or her own health care is critical to achieving a physician-patient relationship in which honest discussions about high-risk behavior are possible. Pediatricians should review their state laws governing health care services available to minors without parental consent. Confidentiality policies should be developed and discussed with both the youth and parent(s) present. Pediatricians should advocate for services (mobile vans, drop-in centers) that can engage hard-to-reach youth populations such as homeless and runaway youth.

2. Preventing and treating substance abuse
   - Primary prevention activities in the community and in care settings should be directed at families of preadolescents and youth and should promote healthy lifestyles. Physicians should support frank discussion between families and their children to avoid the initiation of illicit drug use, including alcohol and tobacco use. Parents also should be given information and strategies on ways to incorporate dialogue about substance use and sexual activity in their homes.
   - Pediatricians should advocate for youth-friendly substance-abuse treatment facilities that are able to accommodate all youth, including those who are uninsured, underinsured, and undocumented. Pediatricians should familiarize themselves with referral sources for substance-abuse prevention and treatment and mental health services.

3. Preventing acquisition of HIV-1 infection
   - Pediatricians should assess HIV-1–related risk behaviors as part of every health care encounter.
   - Pediatricians should advocate for seamless access to reproductive health care services for youth and be aware of the close association of illicit drug use and high-risk sexual activity.
   - Pediatricians should advocate for unencumbered access to sterile syringes and improved knowledge about decontamination of injection equipment. Physicians should be knowledgeable about their states' statutes regarding possession of syringes and needles and available mechanisms for procurement. These programs should be encouraged, expanded, and linked to drug treatment and other HIV-1 risk-reduction education. It is important that these programs be conducted within the context of continuing research to document effectiveness and clarify factors that seem linked to desired outcomes.
   - For youth with a single recent (within 72 hours) high-risk exposure to HIV-1 through either sharing needles/syringes with an HIV-1–infected individual or engaging in unprotected intercourse with an individual who engages in injection drug use, the risks and benefits of PEP with antiretroviral drugs should be considered. Such prophylaxis must be accompanied by risk-reduction counseling and referral to appropriate substance-abuse treatment.

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REFERENCES

1. Centers for Disease Control and Prevention. HIV/AIDS surveillance report 2002. Available at: www.cdc.gov/hiv/stats/hasr1402/2002surveillancereport.pdf. Accessed August 5, 2004
2. National Institute of Allergy and Infectious Diseases. *HIV Infection in Adolescents: Fact Sheet*. Rockville, MD: National Institutes of Health; 2004. Available at: www.niaid.nih.gov/factsheets/hivadolescent.htm. Accessed August 5, 2004
3. Futterman D, Chabon B, Hoffman ND. HIV and AIDS in adolescents. *Pediatr Clin North Am.* 2000;47:171–188
4. Garofalo R, Harper GW. Not all adolescents are the same: addressing the unique needs of gay and bisexual male youth. *Adolesc Med.* 2003;14:595–611, vi
5. Valleroy LA, MacKellar DA, Karon JM, et al. HIV prevalence and associated risks in young men who have sex with men. Young Men's Survey Study Group. *JAMA.* 2000;284:198–204
6. Johnston LD, O'Malley PM, Bachman JG. *Monitoring the Future: National Survey Results on Drug Use, 1975–2002*. Volume I: Secondary School Students. Bethesda, MD: National Institute on Drug Abuse; 2003. NIH Publication 03-5375
7. Lynskey MT, Heath AC, Bucholz KK, et al. Escalation of drug use in early-onset cannabis users vs co-twin controls. *JAMA.* 2003;289:427–433
8. Staton M, Leukefeld C, Logan TK, et al. Risky sex behavior and substance use among young adults. *Health Soc Work.* 1999;24:147–154
9. Clark DB, DeBellis MD, Lynch KG, Cornelius JR, Martin CS. Physical and sexual abuse, depression and alcohol use disorders in adolescents: onsets and outcomes. *Drug Alcohol Depend.* 2003;69:51–60
10. Carroll ST, Riffenburgh RH, Roberts TA, Myhre EB. Tattoos and body piercings as indicators of adolescent risk-taking behaviors. *Pediatrics.* 2002;109:1021–1027
11. Roberts TA, Ryan SA. Tattooing and high-risk behavior in adolescents. *Pediatrics.* 2002;110:1058–1063
12. Brooks TL, Woods ER, Knight SR, Shrier LA. Body modification and substance use in adolescents: is there a link? *J Adolesc Health.* 2003;32:44–49
13. Kendler KS, Bulik CM, Silberg J, Hettema JM, Myers J, Prescott CA. Childhood sexual abuse and adult psychiatric and substance use disorders in women: an epidemiologic and cotwin control analysis. *Arch Gen Psychiatry.* 2001;57:953–959
14. Clatts MC, Goldsamt L, Neaigus A, Welle DL. The social course of drug injection and sexual activity among YMSM and other high-risk youth: an agenda for future research. *J Urban Health.* 2003;80(4 suppl 3):iii26–iii39
15. Simkin DR. Adolescent substance use disorders and comorbidity. *Pediatr Clin North Am.* 2002;49:463–477
16. Greydanus DE, Patel DR. Substance abuse in adolescents: a complex conundrum for the clinician. *Pediatr Clin North Am.* 2003;50:1179–1223
17. Cohen E, Mackenzie RG, Yates GL. HEADSS, a psychosocial risk assessment instrument: implications for designing effective intervention programs for runaway youth. *J Adolesc Health.* 1991;12:539–544
18. Ehrman WG, Matson SC. Approach to assessing adolescents on serious or sensitive issues. *Pediatr Clin North Am.* 1998;45:189–204
19. American Academy of Pediatrics, Committee on Substance Abuse. Tobacco, alcohol, and other drugs: the role of the pediatrician in prevention and management of substance abuse. *Pediatrics.* 1998;101:125–128
20. Killebrew M, Garofalo R. Talking to teens about sex, sexuality, and sexually transmitted infections. *Pediatr Ann.* 2002;31:566–572
21. Duncan P, Dixon RR, Carlson J. Childhood and adolescent sexuality. *Pediatr Clin North Am.* 2003;50:765–780
22. American Academy of Pediatrics, Committee on Psychosocial Aspects of Child and Family Health and Committee on Adolescence. Sexuality education for children and adolescents. *Pediatrics.* 2001;108:498–502
23. Frankowski BL; American Academy of Pediatrics, Committee on Adolescence. Sexual orientation and adolescents. *Pediatrics.* 2004;113:1827–1832
24. American Academy of Pediatrics, Committee on Adolescents. Condom use by adolescents. *Pediatrics.* 2001;107:1463–1469
25. Jackson S, Hafemeister TL. Impact of parental consent and notification policies on the decisions of adolescents to be tested for HIV. *J Adolesc Health.* 2001;29:81–93
26. Sigman G, Silber TJ, English A, Epner JE. Confidential health care for adolescents: position paper of the Society for Adolescent Medicine. *J Adolesc Health.* 1997;21:408–415
27. Dasinger LK, Shane PA, Martinovich Z. Assessing the effectiveness of community-based substance abuse treatment for adolescents. *J Psychoactive Drugs.* 2004;36:27–33
28. American Academy of Pediatrics, Committee on Child Health Financing and Committee on Substance Abuse. Improving substance abuse prevention, assessment, and treatment financing for children and adolescents. *Pediatrics.* 2001;108:1025–1029
29. Drug and Alcohol Services Information System Report. *Facilities Primarily Serving Adolescents: 2002*. Washington, DC: Office of Applied Studies, Substance Abuse and Mental Health Services Administration; 2003
30. American Academy of Pediatrics. Insurance coverage of mental health and substance abuse services for children and adolescents: a consensus statement. *Pediatrics.* 2000;106:860–862
31. Academy for Educational Development and Centers for Disease Control and Prevention. *HIV Prevention Among Drug Users: A Resource Book for Community Planners and Program Managers*. Atlanta, GA: Centers for Disease Control and Prevention; 1997. Available at: www.cdc.gov/idu/pubs/hpdu/hpdu.pdf. Accessed August 5, 2004
32. Abdala N, Crowe M, Tolstov Y, Heimer R. Survival of human immunodeficiency virus type 1 after rinsing injection syringes with different cleaning solutions. *Subst Use Misuse.* 2004;39:581–600
33. Infectious Diseases Society of America. *Policy Statement on Syringe Exchange, Prescribing and Paraphernalia Laws*. Alexandria, VA: Infectious Diseases Society of America; 2001
34. Centers for Disease Control and Prevention. Update: syringe exchange programs—United States, 1998 [published correction appears in *MMWR Morb Mortal Wkly Rep*. 2001;50:427]. *MMWR Morb Mortal Wkly Rep.* 2001;50:384–387
35. Burris S, Lurie P, Abrahamson D, Rich JD. Physician prescribing of sterile injection equipment to prevent HIV infection: time for action. *Ann Intern Med.* 2000;133:218–226
36. Rich JD, Macalino GE, McKenzie M, Taylor LE, Burris S. Syringe prescription to prevent HIV infection in Rhode Island: a case study. *Am J Public Health.* 2001;91:699–700
37. Yoast R, Williams MA, Deitchman SD, Champion HC. Report of the Council on Scientific Affairs: methadone maintenance and needle-exchange programs to reduce the medical and public health consequences of drug abuse. *J Addict Dis.* 2001;20(2):15–40
38. Des Jarlais DC. Structural interventions to reduce HIV transmission among injecting drug users. *AIDS.* 2000;14(suppl 1):S41–S46
39. Gibson DR, Brand R, Anderson K, Kahn JG, Perales D, Guydish J. Two- to sixfold decreased odds of HIV risk behavior associated with use of syringe exchange. *J Acquir Immune Defic Syndr.* 2002;31:237–242

40. Amundsen EJ, Eskild A, Stigum H, Smith E, Aalen OO. Legal access to needles and syringes/needle exchange programmes versus HIV counselling and testing to prevent transmission of HIV among intravenous drug users: a comparative study of Denmark, Norway and Sweden. *Eur J Public Health.* 2003;13: 252–258
41. Semaan S, Des Jarlais DC, Sogolow E, et al. A meta-analysis of the effect of HIV prevention interventions on the sex behaviors of drug users in the United States. *J Acquir Immune Defic Syndr.* 2002;30(suppl 1):S73–S93
42. Junge B, Valente T, Latkin C, Riley E, Vlahov D. Syringe exchange not associated with social network formation: results from Baltimore. *AIDS.* 2000;14:423–426
43. Vlahov D, Des Jarlais DC, Goosby E, et al. Needle exchange programs for the prevention of human immunodeficiency virus infection: epidemiology and policy. *Am J Epidemiol.* 2001; 154(12 suppl):S70–S77
44. Centers for Disease Control and Prevention. Management of possible sexual, injecting-drug-use, or other nonoccupational exposure to HIV, including considerations related to antiretroviral therapy. Public Health Service statement. *MMWR Recomm Rep.* 1998;47(RR-17):1–14
45. Lurie P, Miller S, Hecht F, Chesney M, Lo B. Postexposure prophylaxis after nonoccupation HIV exposure: clinical, ethical, and policy considerations. *JAMA.* 1998;280:1769–1773
46. Centers for Disease Control and Prevention. Updated U.S. Public Health Service guidelines for the management of occupational exposures to HBV, HCV, and HIV recommendations for postexposure prophylaxis. *MMWR Recomm Rep.* 2001;50(RR-11):1–52
47. Havens PL; American Academy of Pediatrics, Committee on Pediatric AIDS. Postexposure prophylaxis in children and adolescents for nonoccupational exposure to human immunodeficiency virus. *Pediatrics.* 2003;111:1475–1489