

The Case for Routine HIV Screening and Impact of Managed Care

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There are an estimated 1.1 million human immunodeficiency virus (HIV)-infected individuals in the United States.¹ In 2006, the most recent year for which incidence data are available, there were an estimated 56,300 new infections in the United States. Recent advances in treatment, including the introduction of highly active antiretroviral therapy (HAART), have dramatically extended the life expectancy of HIV-infected individuals and allowed many patients to have their condition managed in a manner similar to other chronic diseases.

Research and most major medical and public health organizations, including the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC), support vastly expanding screening for HIV by making it a routine test to promote early detection of infection and treatment.

While managed care organizations and institutions routinely follow standard guidelines in the care of HIV-infected patients, few currently follow these recommendations regarding routine HIV screening in asymptomatic or “low-risk” populations.²

The current review is designed to address the empirical and policy arguments put forth in favor of routine HIV screening and the implications of this practice for managed care.

Principles of Screening

Screening is the identification of disease in an asymptomatic population. Universal screening is advocated and conducted for a host of morbid and chronic medical conditions, including breast cancer, colon cancer, cervical cancer, diabetes, hypertension, and hyperlipidemia. HIV infection was once considered a universally fatal condition, with limited life expectancy. The advent of HAART has fundamentally changed the prognosis for most HIV-infected patients and raises the question as to whether universal screening should be employed to help identify asymptomatic patients. In addition, recent research suggests that providing HAART earlier, at CD4 levels previously deemed unnecessary to treat, may benefit patients and decrease their risk of transmitting HIV.³ Therefore, it appears that HIV infection meets all of the criteria put forth by WHO to determine when screening for a clinical condition is indicated (Table 1).⁴ Most notable among these principles are the following: (1) HIV is an important health problem; (2) there are simple, accurate, and reliable screening

Abstract

An estimated 230,000 people in the United States are unaware that they are infected with the human immunodeficiency virus (HIV). Targeted testing strategies are likely to miss a significant proportion of the HIV-infected population, and routine screening could help identify individuals who are likely to experience complications or transmit the virus. Recent advances in treatment, including the introduction of highly active antiretroviral therapy, have dramatically extended the life expectancy of HIV-infected individuals and allowed many patients to have their condition managed in a manner similar to other chronic diseases. There are no quality of care measures, such as Healthcare Effectiveness Data and Information Set (HEDIS) measures, that pertain to routine HIV screening in managed care. Such measures may improve the identification of patients with HIV, and bring them into care earlier. Routine screening would provide the opportunity to identify more HIV-infected persons and bring them into care, a process that would be cost-effective in the long term. Early detection allows for the timely provision of antiretroviral medications, immunizations, and prophylactic antimicrobials, which substantially reduces mortality and hospitalizations. Given the public health impact of HIV infection, federal and private partnerships should be considered to establish routine HIV screening practices.

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Table 1. World Health Organization Principles to Guide Medical Screening⁴

- 1 The condition should be an important health problem.
- 2 There should be a treatment for the condition.
- 3 Facilities for diagnosis and treatment should be available.
- 4 There should be a latent stage of the disease.
- 5 There should be a test or examination for the condition.
- 6 The test should be acceptable to the population.
- 7 The natural history of the disease should be adequately understood.
- 8 There should be an agreed policy on who to treat.
- 9 The total cost of finding a case should be economically balanced in relation to medical expenditure as a whole.
- 10 Case-finding should be a continuous process, not just a “once and for all” project.

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tests; (3) infection can be asymptomatic; (4) there are effective treatments; and (5) the costs are less and the outcomes are better with early treatment compared with later treatment.⁵

Current Status of HIV Testing

A large proportion of HIV-infected individuals in the United States have not been tested or identified. Each year, approximately 16 million to 22 million persons in the United States undergo testing for HIV.⁶ In 2002, it was estimated that 38% to 44% of all adults had been tested at least once for HIV. Despite these figures, estimates indicate that there are more than 230,000 people in the United States who are unaware that they are infected with HIV.⁷ This estimate represents approximately 21% of the 1.1 million HIV-infected individuals. HIV testing tends to occur, although not exclusively, among those individuals in targeted populations, such as those with a history of injection drug use or men who have sex with men. However, 32% of all new HIV infections and 83% of new infections among women occurred in individuals who were likely infected via heterosexual contact and not through injection drug use or homosexual behavior.

In addition, evidence indicates that clinicians do not always conduct HIV testing in those with clinical indications. One study of more than 7000 patients with at least 1 medical condition closely associated with HIV infection or acquired immunodeficiency syndrome (AIDS) (Table 2) determined that only 4% underwent testing for HIV infection (Figure).⁸ Unfortunately, identifying patients “at risk” and identifying symptoms of HIV infection during the early stages of infection can be very difficult. A retrospective, population-based study examined the medical records of

patients in South Carolina recently diagnosed with HIV and determined that 73% of the patients had been to a medical facility prior to being diagnosed with HIV and that 79% of the 13,448 healthcare visits involved medical conditions that would not likely prompt the need for an HIV test.⁹ Therefore, even targeted testing strategies are likely to overlook a significant proportion of the HIV-infected population, and routine screening could help identify individuals who are likely to experience complications or transmit the virus.

Recommendations From the WHO, CDC, and Major Medical Organizations

In 2004, WHO recommended provider-initiated HIV testing to help increase detection of undiagnosed cases of HIV infection.^{10,11} In 2006, the CDC recommended that all patients aged 13 to 64 years, in all healthcare settings where the prevalence is greater than 0.1%, be screened for HIV infection, and that persons at high risk for HIV infection be screened at least annually.¹² The CDC advocated that routine HIV screening should be standard in medical practice, no different from screening for any other chronic condition, such as cardiovascular disease or diabetes.

In 2009, the American College of Physicians (ACP) recommended that clinicians adopt routine screening for HIV.¹³ In their guidelines, the ACP noted the following: (1) early identification and treatment for HIV provides substantial health benefit by extending the life of the person identified as having HIV; (2) risk-based screening has failed to identify a substantial proportion of people with HIV early in disease; (3) routine opt-out screening (screening all individuals unless they decline to be tested) has been widely implemented and highly successful for prenatal HIV screening; and (4) strong evidence indicates that screening is cost-effective, even when the prevalence of HIV is low. In addition to the ACP, the American Academy of HIV Medicine¹⁴ and multiple other health-focused organizations have supported the CDC recommendations.

Most State Laws Allow Routine HIV Screening

While most guidelines from major medical societies encourage routine HIV screening, some state laws present a barrier to this practice. HIV-specific legislation has been enacted in every state and some legislation is in conflict with

■ **Table 2.** HIV Screening by Potential AIDS-Defining Event Category⁸

Potential AIDS-Defining Event	N	Screening Rate, %
Burkitt's or immunoblastic lymphoma or primary lymphoma of brain	2980	3.0
Encephalopathy	2066	5.0
Invasive cervical cancer	958	4.4
Candidiasis of bronchi, trachea, lung, or esophagus	542	7
Histoplasmosis, disseminated or extrapulmonary	370	2.2
Wasting/cachexia	350	4.3
Disseminated herpes or herpes meningitis	94	13.8
<i>Mycobacterium avium</i> or <i>Mycobacterium kansasii</i> , disseminated or extrapulmonary	67	13.4
<i>Pneumocystis carinii</i> pneumonia	48	10.4
Kaposi's sarcoma	35	8.6
Progressive multifocal leukoencephalopathy	20	0
Cytomegalovirus pneumonia or retinitis	16	25
Coccidioidomycosis, disseminated or extrapulmonary	13	7.7
Cryptococcosis, extrapulmonary	11	9.1
Miscellaneous (toxoplasmosis of brain, chronic isosporiasis, Salmonella septicemia, chronic cryptosporidiosis)	5	20

AIDS indicates acquired immunodeficiency syndrome; HIV, human immunodeficiency virus.

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the CDC recommendations. A recent review concluded that state statutory laws are evolving toward greater compliance with the CDC recommendations.¹⁵ It noted that the statutory frameworks of 34 states and Washington, DC, were either consistent with or neutral to the CDC recommendations, and would enable full implementation of routine HIV screening. In the 2 years since release of the CDC recommendations, 9 states had passed new legislation to move from being inconsistent to consistent with the guidelines. States may still stipulate who can perform screening, counseling, and partner notification services, and may require informed consent prior to screening.¹⁶ Nonetheless, state law should not present a barrier to universal HIV screening in most jurisdictions.

Cost-Effectiveness of Routine HIV Screening

The clinical benefit of diagnosing HIV infection is well-established. Early detection allows for the timely provision of antiretroviral medications, immunizations, and prophylactic antimicrobials to HIV-infected individuals. These treatments substantially reduce mortality and hospitalization. Studies have shown that early HIV detection is cost-effective as well. Studies conducted from a societal perspective have shown that routine HIV screening is cost-effective if the prevalence of undiagnosed HIV infection is as low as 1% or 0.1%. In these studies, screening is associated with increased life expectancy and/or quality-adjusted life expectancy. Cost-

effective ratios of \$15,000 to \$36,000 per quality-adjusted life-year gained have been reported.^{5,17,18} This finding makes routine HIV screening comparable in cost-effectiveness to tests routinely performed for other chronic conditions, such as diabetes, hypertension, breast cancer, and colon cancer.¹⁹

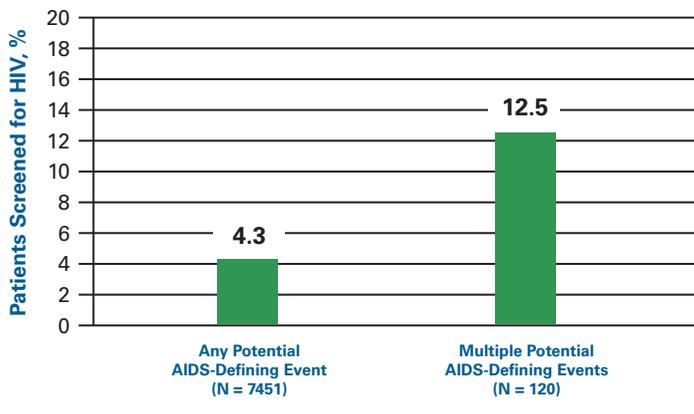
Some experimental models propose that universal HIV screening and treatment demonstrate such profound efficacy that they would nearly eliminate HIV transmission.^{20,21} Cost-effectiveness does not necessarily mean inexpensive, however. A recent analysis estimated that routine HIV screening would increase the costs of HIV testing and care to government programs by \$2.4 billion over 5 years.²² Notably, expanded HIV screening represented only 18% of the total cost increase.

The cost of antiretroviral medications typically represents the majority of expenditures for HIV-infected patients. Nonetheless, due to their ability to improve clinical outcomes, the provision of antiretroviral medications moves patients from the more costly low CD4 categories to the less expensive high CD4 categories.²³ Therefore, provision of antiretroviral therapies is cost-saving due to decreased morbidity, increased life expectancy, and increased workplace productivity.²⁴

Current Practices in Managed Care

Limited information is available about HIV screening practices within managed care organizations in response to

■ **Figure.** Percentage of Patients Screened for HIV⁸



AIDS indicates acquired immunodeficiency syndrome; HIV, human immunodeficiency virus.

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WHO, CDC, and major medical society recommendations. However, it has been noted that most managed care plans only screen patients at increased risk for HIV infection (ie, targeted testing). There are no quality of care measures, such as Healthcare Effectiveness Data and Information Set (HEDIS) measures, that pertain to routine HIV screening in managed care.²⁵ Such measures may improve the identification of patients with HIV, and bring them into care earlier.

Kaiser Permanente expanded the US Preventive Services Task Force guidelines²⁶ for HIV screening and developed several HIV care quality measures, including those for diagnosing HIV, getting patients into care, care processes, and care results.^{2,27} Kaiser Permanente has approximately 18,000 active patients with HIV infection and is the second largest provider of HIV care in the United States.² In 2007, a Kaiser Permanente representative indicated that its policy was to conduct HIV testing in all at-risk adolescents and adults and all pregnant women.²⁷ At the time, Kaiser Permanente indicated that it performed 340,000 antibody tests annually. While more than 90% of pregnant mothers underwent testing, 15% of the Kaiser Permanente members had been tested in the prior 5 years, and roughly 8% had been tested at some point. To adhere to the CDC recommendations, Kaiser Permanente speculated that it would have to perform 5 million additional tests, which would identify approximately 1700 new infections. Citing the expense of antiretroviral medications, with the cost estimated at \$15,000 per patient per year, Kaiser Permanente noted that it would incur an additional cost of \$26,599,450 per year for care.

The Veterans Administration (VA) is the largest single provider of care for HIV-infected individuals in the United States, with more than 20,000 HIV-infected patients in care. Recent studies have demonstrated that the prevalence of undetected HIV infection was sufficiently high in the VA—0.1% to 2.8% among outpatients and up to 1.7% among inpatients—to justify routine HIV screening.²⁸ A separate study demonstrated that one half to two thirds of VA patients at risk for HIV had not been tested.²⁹ Recently, the VA changed its policy so that HIV testing is now part of routine medical care for all veterans (if they consent).³⁰ Furthermore, the VA no longer requires written informed consent for HIV testing, nor does it require that scripted pre- and post-test counseling accompany HIV testing. Congruent with the CDC recommendations, the VA hopes to establish routine HIV screening as simply another measure performed during a physical examination.³¹ Significant efforts were required to increase the level of HIV screening in the VA. Provider education, clinical reminder systems, and social marketing were all used, and several VA systems were able to double their screening rates.³² Although routine screening occurred in less than 15% of patients,³³ these efforts were shown to be necessary to maintain the sustainability of routine HIV screening.

Challenges and Recommendations to Improve Screening for HIV

For most clinical practices, there are challenges and logistic issues to address to achieve routine HIV screening.³⁴ Some of these challenges and the recommendations to help address them are listed below.

Rapid versus standard screening. Rapid screening is the preferred method, and there are a number of tests available (Table 3).³⁵ A false reactive result may occur in a small percentage of cases, but those results can be verified with a confirmatory standard enzyme-linked immunosorbent assay or Western blot test. While rapid screening may not be appropriate for several managed care facilities, having results within 20 minutes while the patient is still in the office is advantageous. If rapid screening is employed, it is imperative that staff be fully trained on the test itself as well as how to discuss the results with patients. The sensitive nature of the results have led the Clinical Laboratory Improvement Amendments to state that personnel operating rapid HIV tests must be counselors in good standing (or other healthcare personnel qualified to conduct testing)

Table 3. US Food and Drug Administration–Approved Rapid HIV Screening Tests³⁵

Test	Total Time Required to Conduct Test	Window Period for Reading Results
OraQuick ADVANCE Rapid HIV-1/2 Antibody Test	<5 min (<10 min for plasma) plus 10-min wait time	20-40 min
Uni-Gold Recombigen HIV	<5 min plus 10-min wait time	10-12 min
Reveal G-3 Rapid HIV-1 Antibody Test	3-5 min no additional wait time	Immediately
MultiSpot HIV-1/HIV-2 Rapid Test	10-15 min no additional wait time	Immediately (results accurate for up to 24 h)
Clearview HIV 1/2 STAT-PAK	<5 min plus 15-min wait time	15-20 min
Clearview COMPLETE HIV 1/2	<5 min plus 15-min wait time	15-20 min

HIV indicates human immunodeficiency virus.
Adapted from Centers for Disease Control and Prevention. FDA-approved rapid HIV antibody screening tests – purchasing details. February 4, 2008.
<http://www.cdc.gov/hiv/topics/testing/rapid/rt-purchasing.htm>.

and have completed training in conducting rapid HIV screening.³⁶

Consent. An increasing number of managed care facilities are removing the requirement for written consent. As stated previously, the VA no longer requires written consent, consistent with the approach recommended by the CDC.

Insufficient provider time and competing priorities. Several recent studies examining barriers to the adoption of routine HIV screening highlight lack of provider time and competing priorities during a given clinic visit as major barriers.^{34,37} In one study, these 2 factors were cited in all of the sites that were surveyed.³⁴ They did note, however, that solutions such as the removal of written informed consent and reduction in pretest counseling would help to alleviate both of these barriers.

Patient acceptance. While barriers can be removed to enhance provider offering of HIV screening to their patients, patient acceptance remains a separate and significant barrier.³⁴ In a study examining rapid HIV screening in community health centers, while the rate of offering testing increased, only about two thirds of those patients offered screening agreed to be tested.³⁸ While this figure is promising, it indicates that programs still have a way to go in their screening efforts. The hope is that, in time, patients will recognize HIV screening as another component of routine general medical care. This acceptance requires educating patients on HIV and the value of knowing their infection status. While many may still view HIV as a “death sentence,” it is increasingly being viewed as a chronic condition that can be effectively treated with medication if detected early.

Counseling. Patients exhibiting high-risk behaviors should receive counseling for these behaviors to reduce their risk of contracting HIV. In addition, staff involved with screening efforts need to be properly trained on how to counsel patients who have received a positive result to help them engage in safe practices while facilitating their linkage to HIV care.

Reimbursement. In addition to counseling patients on risk behaviors and the concept that HIV infection is a chronic condition, medical professionals need to make sure that patients have the proper insurance coverage for reimbursement. Treatment outcomes may be improved if the patient, patient advocates, and health professionals have a better understanding of the available insurance options. If patients recognize that their treatment is covered by insurance, they may be more compliant with the treatment plan. One study showed that improving insurance coverage in patients who were challenging to treat was associated with adequate treatment compliance.³⁹ Of note, the Center for Medicare & Medicaid Services recently announced that it would cover the cost of HIV screening among Medicare recipients.⁴⁰

Referral and linkage to care. Treating patients with HIV requires dedicated and coordinated teamwork. According to the IDSA,⁴¹ HIV care sites should use a multidisciplinary model for treating patients. The team should also have an individual who is designated as being the one in regular contact with both the patient and all the members of the care team to ensure that referrals and linkage to care are seamless.

New treatment recommendations. Treatment for HIV is continually evolving and improving. All medical professionals involved in the care of HIV-infected patients should be cognizant of the latest guidelines on treatment as well as screening to ensure that patients get the best care possible.⁴²

Adherence to therapy. Increased adherence to HAART is associated with improved clinical outcomes. Unfortunately, adherence is often poor in patients with HIV. For example, one study noted that 30% of patients entering a hospital to treat an opportunistic infection knew they had HIV but had not sought treatment.⁴³ Furthermore, another 36% of the patients knew they had HIV but were noncompliant. Therefore, educating patients about the importance of adherence as well as educating staff on how to recognize signs of nonadherence are vital to a successful treatment program. The importance of adherence was well-documented in a study that calculated the mortality rate of 1422 patients with HIV and found that nonadherent patients had higher mortality rates than adherent patients with similar CD4+ cell counts.⁴⁴

Aligning Incentives

The impact of HIV infection on healthcare, employers, and the economy is substantial. In 2002, the cost of new HIV infections in the United States was estimated at \$36.4 billion. Although \$6.7 billion represented direct medical costs, \$29.7 billion reflected losses in human productivity.²⁴ Employers, therefore, experience a substantial impact from HIV infection based on its prevalence among otherwise young, healthy workers. From the healthcare provider perspective, substantial costs are incurred with each new diagnosis of HIV infection, yet ultimately the provision of antiretroviral therapy is cost-saving, due to decreased morbidity, increased life expectancy, and increased productivity. Implementation of quality of care measures, such as HEDIS measures, may improve the identification of patients with HIV, and bring them into care earlier. Given the public health impact of HIV infection, the potential for substantial decreases in transmission with aggressive screening and treatment, and the impact on the workforce, combined federal and private partnerships should be considered to help attain the goals of routine HIV screening in accordance with current expert guidelines.⁴⁵

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