



HIV/AIDS Fundamentals

What You Need to Know

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Prepared by the National Minority AIDS Council (NMAC), Division of Technical Assistance, Training, and Treatment, and The Zaplin Group, sponsored by the Centers for Disease Control and Prevention (CDC).

Introduction

Preventing the spread of HIV/AIDS and working effectively with those already infected requires a basic understanding of the problem and of the steps required to address it. A basic understanding of the problem includes: knowledge of who in the U.S. is most susceptible to acquiring infection; basic knowledge of HIV and how it causes AIDS-related diseases; knowledge of how HIV is transmitted and the behaviors that facilitate transmission; and knowledge of available HIV/AIDS therapy.

Since HIV infection is transmitted from one person to another, the first step in arresting its spread is to provide at-risk individuals with this basic understanding of HIV/AIDS. Additional steps include: altering behaviors that facilitate transmission such as reducing the number of sex partners and intravenous (IV) drug use; promoting preventive behaviors such as the use of condoms and the use of sterile syringes coupled with substance abuse outreach and treatment; and, widespread HIV testing to enable those infected to be treated and counseled to prevent further infections.

Purpose and Target Audience

The purpose of this booklet is to provide basic information on HIV/AIDS to better enable faith- and community-based organizations (F/CBOs) and corrections personnel to provide effective HIV/AIDS services to the millions of at-risk individuals who are detained, incarcerated, and released by correctional facilities in the U.S. each year. Although this booklet is targeted primarily at F/CBOs and corrections personnel, much of the information related to HIV/AIDS may be useful to others including policy and funding decision-makers, social advocacy groups, and at-risk and other individuals.

Organization

This booklet begins with statistics, examining the race/ethnicity of the population of 34 U.S. states and their share of HIV/AIDS infection. This is followed by basic information on HIV/AIDS including transmission, prevention, infection, testing, counseling, treatment, and common HIV myths. The last section addresses the continuity of care—HIV/AIDS prevention and treatment services from the correctional setting to the community. Examples and contact information for various programs providing HIV/AIDS related transition services to prison and jail inmates are also included.



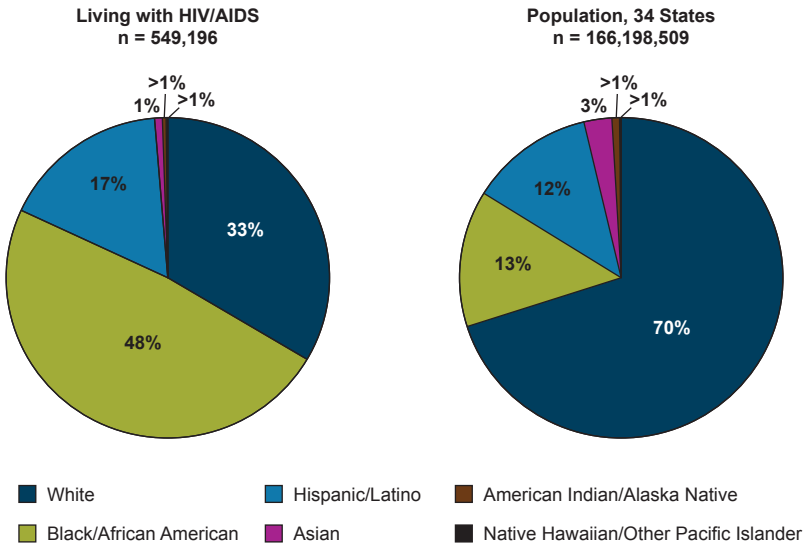
Demographics and Trends

HIV/AIDS Statistics—General Population

Data from 34 states with confidential name-based HIV reporting indicates that HIV/AIDS in the general population disproportionately impacts the African American community. While African Americans represent only 13% of the population, they constitute 48% of all those living with HIV/AIDS in these states.¹ (Figure 1) Unchecked, this disparity may worsen as in 2007 the rate of new diagnoses of HIV/AIDS in this community was eight times higher than for Caucasians.

Figure 1

Percentages of People Aged 13 Years and Older Living with HIV/AIDS and Population, by Race/Ethnicity, 2007—34 States with Confidential Name-Based HIV Infection Reporting



Source: CDC, <http://www.cdc.gov/hiv/topics/surveillance/resources/reports/2007report/pdf/2007SurveillanceReport.pdf>.

HIV/AIDS Statistics—Criminal Justice System

The U.S. incarcerates more—both in numbers and percentage—of its citizens than any other country in the world.² In 2007, the U.S. incarcerated about 800,000 more people than China with more than four times the U.S. population.² The U.S. prison population has nearly tripled since 1987.² More than one in 100 adult Americans are behind bars.² One in 31 adult Americans are under correctional control: either in jail, prison, probation or parole.³ One in 11 African American adults (9.2%) was under correctional supervision at the end of 2007³—one in nine African American men ages 20 to 34 was behind bars.²

The disproportionate HIV/AIDS prevalence in the African American community, combined with the disproportionate rates of incarceration for this community leads to an HIV/AIDS prevalence in prisons⁴ that is more than 3.8 times* higher than the general population.⁵ In two states, New York and Florida, the HIV/AIDS prevalence in prisons was 14 and 9 times higher, respectively, than the general population.⁴

* The HIV prevalence of 1.7% in prisons divided by the 2006 CDC prevalence estimate of 0.448% in the U.S. population. The HIV prevalence in prisons may be underestimated as the majority of states and the Federal system did not test all their inmates (only 21 states did), an unknown number of HIV infected inmates were not counted or included in the 1.7% estimate. The HIV prevalence in prisons, therefore, may be significantly higher than 3.8 times that of the general population.

HIV/AIDS Fundamentals

Figure 2
HIV Life Cycle

1 Binding and Fusion: HIV begins its life cycle when it binds to a CD4 receptor and one of two co-receptors—CCR5 or CXCR4 on the surface of a CD4+ T-lymphocyte. The virus then fuses with the host cell. After fusion, the virus releases RNA, its genetic material, into the host cell.

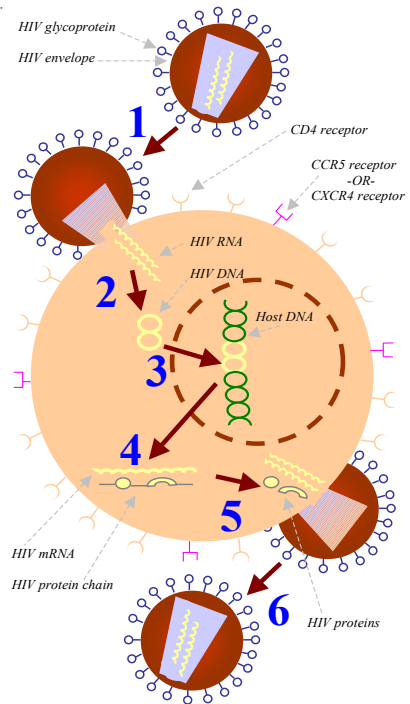
2 Reverse Transcription: An HIV enzyme called reverse transcriptase converts the single-stranded HIV RNA to double-stranded HIV DNA.

3 Integration: The newly formed HIV DNA enters the host cell's nucleus, where an HIV enzyme called integrase "hides" the HIV DNA within the host cell's own DNA. The integrated HIV DNA is called provirus. The provirus may remain inactive for several years, producing few or no new copies of HIV.

4 Transcription: When the host cell receives a signal to become active, the provirus uses a host enzyme called RNA polymerase to create copies of HIV genetic material, as well as shorter strands of RNA called messenger RNA (mRNA). The mRNA is used as a blueprint to make long chains of HIV proteins.

5 Assembly: An HIV enzyme called protease cuts the long chains of HIV proteins into smaller individual proteins. As the smaller HIV proteins come together with copies of HIV's RNA genetic material, a new virus particle is assembled.

6 Budding: The newly assembled virus pushes out ("buds") from the host cell. During budding, the new virus steals part of the cell's outer envelope. This envelope, which acts as a covering, is studded with protein/sugar combinations called HIV glycoproteins. These HIV glycoproteins are necessary for the virus to bind CD4 and co-receptors. The new copies of HIV can now move on to infect other cells.



Source: Adapted from AIDSinfo http://aidsinfo.nih.gov/contentfiles/HIVLifeCycle_FS_en.pdf.

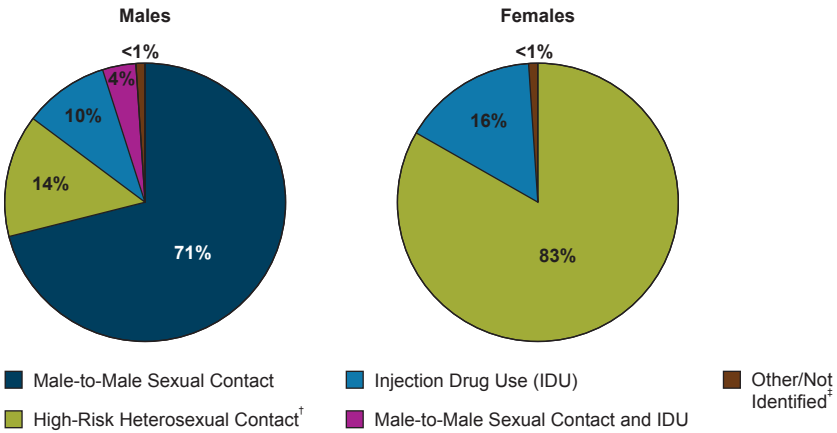
HIV Transmission and Prevention

HIV is primarily transmitted through contact with blood, semen, or vaginal fluids of an infected person through anal, vaginal, or oral sex and the sharing of needles with an infected person during injection drug use. Mothers can also transmit HIV to their child in the womb and through breast-feeding.⁶ Among the persons diagnosed with HIV/AIDS in 2007, males acquired their infections primarily from male-to-male sexual contact (MSM) (71%), heterosexual contact (14%, and through intravenous (IV) drug use (10%-14%). Females primarily acquired their infection through heterosexual sex (83%) and IV drug use (16%)⁷ (Figure 3). It is important to note that the major routes for HIV transmission may vary in different states.⁸ In New York, for example, the major source of infection for those with AIDS (men and women combined, through 2007) was injection drug use (37.6%) followed by MSM (28.7%) and heterosexual sex (11.9%).⁹ In California, MSM (67.2%) was the major route for HIV transmission.¹⁰

Since there is currently no protective vaccine, and as HIV cannot be eliminated from an infected person, prevention of HIV transmission can only occur by altering the risk behaviors that lead to infection.

Figure 3

Percentages of HIV/AIDS Cases Among Adults and Adolescents, by Sex and Transmission Category 2007—34 States



Note: Data includes people with a diagnosis of HIV infection regardless of their AIDS status at diagnoses.

[†] Heterosexual contact with a person known to have, or to be at high risk for HIV infection.

[‡] Includes hemophilia, blood transfusion, perinatal exposure, and risk factors not identified.

Source: CDC: <http://www.cdc.gov/hiv/topics/surveillance/resources/slides/general/index.htm>.

Risk Behaviors

In the U.S., as in many other countries, the majority of HIV infections are transmitted through unprotected sexual contact and IV drug use. The vast majority of HIV-infected men and women in prisons and jails acquired their infection outside, in the community.¹¹ Although sexual contact and IV drug use occur much less frequently in the correctional setting than outside of it,¹² they carry a higher risk of transmission when they occur as the prevalence of HIV infection in the prison population is greater than 3.8 times that of the general population.

Risk Behaviors (cont.) As few correctional institutions distribute condoms, inmates trying to practice safe sex may resort to makeshift devices such as using rubber gloves and reused plastic wrap.¹³ Tattooing and body piercing are widespread in prisons and often involve makeshift and unsterilized devices such as sharpened paperclips, staples and plastic ink tubes from ballpoint pens, practices which present a risk for HIV infection.¹⁴

Substance Abuse and Alcohol Intravenous drug use contributes to HIV infection by directly transmitting the virus from one person to another when the injection equipment is reused and remains contaminated with small amounts of the previous person's HIV-infected blood. Alcohol and drug abuse, in general, increases the risk of acquiring or transmitting HIV by impairing decision-making capability, increasing impulsivity, lowering inhibitions, reducing the perception of personal risk, and decreasing the ability to negotiate safe sex.^{15,16}

A large percentage of men and women enter the correctional setting with a history of drug use. Fifty-six percent of federal prisoners were incarcerated for drug offenses in 2007. In the state prisons, 29% of women and 19% of males were incarcerated for drug-related offenses in 2007. Eighty-two percent of all drug arrests in 2007 were for possession.¹⁷ An unknown percentage of other offenses were also drug-related. One-half to two-thirds of inmates in

*Substance Abuse
and Alcohol (cont.)*

jails and in federal and state prisons meet the standard diagnostic criteria for alcohol/drug dependence or abuse.¹⁸ Prisons and jails, however, provide treatment to only 7%–17% of these prisoners.¹⁸

Drug use continues in prisons.¹² Drugs such as heroin, cocaine and marijuana may be supplied by visitors, staff, and through the mail.¹³ No domestic correctional system distributes bleach or clean needles to inmates. Needles and syringes, stolen from the health clinic, or supplied by visitors or staff, are scarce and may be reused without sterilization. Bleach along with needles and syringes are considered contraband in the correctional setting. Pieces of light bulbs and pens are also used by inmates as makeshift devices to shoot drugs.¹³

Prevention

The basics of prevention, known as ABC, generally entail education and the promotion of abstinence of sexual activity, being faithful to one person or having fewer sexual partners, and using male or female condoms. Studies have indicated that abstinence only programs are ineffective in preventing transmission^{19,20} while abstinence plus programs—those that promote abstinence as the safest choice and also promote the use of condoms and other safe sex practices—are more effective.²¹ Emphasis on abstinence as a main prevention strategy may be unrealistic (see HIV Myth #5 on page 31).

Prevention (cont.) The National Institute on Drug Abuse states that “Comprehensive HIV/AIDS prevention, which includes the strategies and components of community-based outreach, drug abuse treatment, and sterile syringe access programs—all in combination with testing and counseling for HIV and other infections—currently is the most effective approach for preventing the spread of HIV, other blood-borne infections, and Sexually Transmitted Diseases (STDs) in drug-using populations.”²² The Centers for Disease Control and Prevention (CDC) stated, “Ensuring that IDUs [injecting drug users] who continue to inject have access to sterile syringes is a vitally important strategy to prevent disease transmission. Ensuring access to sterile syringes does not increase the number of persons who inject drugs or the number of drug injections. It does reduce the sharing and reuse of syringes.”²³ Sterile syringes are available in the 31 states listed at <http://www.nasen.org/>.



Prevention and the U.S. Correctional System

Prevention in the correctional setting is problematic as sexual activity and drug use are prohibited and may not be officially acknowledged. Laws and policies, however, which prohibit sex and drug use in prisons are not able to prevent their occurrence.^{24,13} Supplying condoms and sterile syringes is common in many European prisons.²⁵ Some correctional facilities in the U.S. supply condoms to their inmates but the supply of sterile syringes is more controversial and is not done.

The CDC recommends that HIV testing in prisons occur at entry and before release as well as periodically during incarceration.²⁶ Nevada is the only U.S. state that complies with this testing schedule recommendation, and only 21 states test all prison inmates at some point during incarceration.⁴ The CDC also recommends that comprehensive education and counseling be made available to this population.²⁶ As many correctional systems do not have the expertise or means to adequately deal with the health needs of inmates, collaboration with public health programs and departments is recommended.²⁷

Upon release, ex-inmates may soon engage in high risk behaviors. As one former male inmate explained, “When you come straight home, you are thinking about having sex right away, you ain’t thinking about nothing else.”¹³ Supplying condoms to inmates when they are released is therefore recommended. A Washington-based study found that those released from incarceration had a high risk of drug overdose within the first two weeks after release.²⁸

The parole system is largely supervisory and provides few support services or links to health care.²⁹ A new parole model is recommended that integrates a community-centered approach, providing health care services to those released and intensive treatment to substance abusers while providing alternatives to reincarceration for parole violators.^{29,30}

Prevention and Social Inequality

The World Health Organization (WHO) stated that, “In countries at all levels of income, health and illness follow a social gradient: the lower the socioeconomic position, the worse the health.”³¹ The CDC noted “Inequalities in health status in the U.S. are large, persistent, and increasing. Research documents that poverty, income and wealth inequality, poor quality of life, racism, sex discrimination, and low socioeconomic status are the major risk factors for ill health and health inequalities.”^{32,33} The CDC recognizes the necessity to address the social causes of health disparities for the prevention and control of HIV/AIDS, viral hepatitis, STD and tuberculosis (TB).³⁴

The mass incarceration of the poor and the underprivileged U.S. population^{2,3} is also a major contributor to the increasing health disparity in the U.S.^{29,35} Improving access to health care, providing jobs, improving education, expanding mass transportation, and reversing U.S. incarceration policies are just some of the fundamental approaches needed to address prevention and the root causes of health disparities in this country.



HIV Infection— Symptoms

Symptoms of Primary HIV Infection

Some of the most common symptoms experienced by 40% to 90% of persons soon after becoming infected with HIV include fever, rash, tiredness, headache, achy muscles and joints, swollen “glands” or lymph nodes, and sore throat.³⁶ As these symptoms, occurring within one to four weeks after infection, resemble those of common illnesses such as the flu, HIV infection is not often diagnosed at this stage.³⁷ Two studies have noted that if symptoms include fever combined with a rash,³⁸ or fever combined with a rash and achy muscles³⁹ the odds increase that a suspected case is due to a recent HIV infection.

This symptomatic condition is called acute viral syndrome of primary HIV infection (PHI). PHI is defined as the period, usually lasting four weeks, between HIV infection and when the immune system generates a sufficient antibody response that can be detected by commonly used tests. These symptoms usually disappear after the immune system is able to reduce the initially high HIV viral load. The HIV-infected individual then generally enters a long chronic and asymptomatic phase that may last 5 to 10 years.

Symptoms of Advanced HIV Infection

The CDC describes some of the symptoms that may be associated with advanced HIV infection as follows: rapid weight loss; dry cough; recurring fever or profuse night

HIV Infection— Symptoms (cont.)

sweats; profound and unexplained fatigue; swollen lymph glands in the armpits, groin, or neck; diarrhea that lasts for more than a week; white spots or unusual blemishes on the tongue, mouth or throat; pneumonia; red, brown, pink, or purplish blotches on or under the skin or inside the mouth, nose, or eyelids; memory loss, depression, and other neurological disorders.⁴⁰ As with primary HIV infection, these symptoms may be caused by other illnesses and only HIV testing can accurately determine an HIV infection.

HIV Infection— Immunological Response

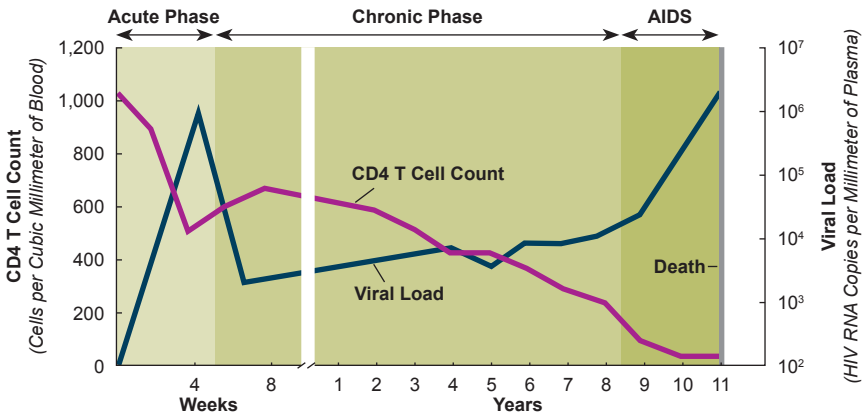
CD4+ T lymphocyte cells are a key component in coordinating the immune system's response to infection. CD4+ T-cells are also preferentially targeted by HIV. After entering these cells, HIV “hijacks” the functions of the cell to make more copies of itself. After about two days, the CD4+ T-cell is killed.⁴¹ During the acute or primary phase of the infection, the HIV population doubles every ten hours, expanding rapidly to as many as 44 million copies of HIV per millimeter (one-fifth of a teaspoon) of plasma (the liquid portion of blood) by the third or fourth week after infection.⁴² As the body cannot produce sufficient CD4+ T-cells to replace those being killed, the CD4+ T-cell count declines during this period. After peak HIV production, which varies for different individuals, the immune system gradually brings HIV production down from its peak levels to a set point⁴¹ that generally remains stable for many years—the chronic phase.

HIV Infection— Progression

After the short initial stage of acute infection, CD4+ T-cell counts are also generally stable with a slight decline each year. Each part of the often used term—HIV/AIDS—also represents different stages of infection. During the chronic phase, the infected person is considered to be HIV positive (HIV+). Even during the chronic phase, millions of CD4+ T-cells are killed and replaced each day and billions of HIV viruses are produced each day.⁴¹ The onset of AIDS is defined as when CD4+ T-cell counts reach 200 or when a person incurs an AIDS-associated illness. Without antiretroviral therapy, the HIV viral load increases, the CD4+ T-cell level continues to decrease, and the patient dies of opportunistic diseases allowed by the weakened immune system (Figure 4).

Figure 4

HIV/AIDS Disease Progression Measured by CD4 Count and Viral Load



Adapted from: *Scientific American*. Retrieved from: <http://www.scientificamerican.com/article.cfm?id=can-you-explain-aids-and>.

HIV Testing

Importance of Testing

Initiating treatment late with a low CD4+ T-cell count results in faster disease progression and death. A CDC study in five cities found that 67% of African American, 48% of Hispanic, and 18% of Caucasian men did not know they were HIV+.⁴⁴ In another CDC study, 54% of 3,450 individuals were tested so late, they did not know they were HIV+ until less than one year before being diagnosed with AIDS; they were probably infected with HIV for about 5–10 years without knowing. These “late testers” tended to be younger (18–29 age group), heterosexual, African American, and Hispanic.⁴⁵ Overall, from 1996 to 2005, the CDC estimated that 45% of individuals were tested late and diagnosed with AIDS within three years after first testing positive.⁴⁶ One study estimated that those unaware of their HIV infection were responsible for 54%–70% of HIV transmissions in the U.S.⁴⁷

With testing, patients are able to benefit from earlier treatment and are less likely to transmit HIV to others. A review and analysis of 11 studies found a 68% reduction in unprotected sex between HIV negative and positive persons after the infected partner learned they were positive for HIV.⁶⁰ As antiretroviral treatment lowers the viral load, the risk of HIV transmission to a partner is reduced by an estimated 60%–80%.^{49,50}

Types of Testing *Anonymous and Confidential*

Most states offer anonymous testing as well as confidential HIV testing while 11 states offer only confidential testing.⁵¹ With anonymous testing, the individual is assigned a unique testing code and the person's name is not asked for or reported to anyone even if the results are positive for HIV infection. Testing results are given orally and not in writing.⁵²

With confidential testing, individuals supply their name, Social Security Number, and date of birth which are then sent and kept under strict security by the jurisdictions' public health departments. The Privacy Rule under the Health Insurance Portability and Accountability Act of 1996 (HIPPA) prohibits the use or disclosure of patients health information, including HIV status, without permission from the patient.⁵³ The names are then turned into codes and sent to the CDC. This process enables the CDC and public health organizations to know how many people are HIV-infected ensuring that local services are properly funded.⁵²

With confidential testing, the individual gets his or her results in writing and is then able to show it to their partner(s). If the individual tests positive for HIV, the written record allows them to access medical and psychosocial support services. Individuals concerned about giving their name sometimes first test on an anonymous basis and then, if positive, retest on a confidential basis in order to be able to access needed services.⁵²

Types of Testing (cont.)

Opt-Out Testing

The CDC estimated that between 250,000 to 312,000 people were infected with HIV and did not know it.⁵⁴ A high percentage (39% in 2004) of HIV-infected individuals could not benefit from the availability of excellent treatment for HIV/AIDS as they did not know they were infected until less than one year before diagnoses of AIDS.⁵⁴

For these reasons and others, such as reducing the stigma associated with HIV testing, the CDC amended its testing recommendations in 2006 to promote routine HIV testing in all health care settings, including emergency departments, urgent care clinics, inpatient services, STI clinics, TB clinics, community clinics, correctional health care facilities, and primary care settings.⁵³ Those at high risk for HIV infections (including their sex partners) such as injection drug users, persons who exchange sex for money or drugs or persons with more than one sex partner since their last HIV test, should be routinely tested at least annually.⁵³

In the letter accompanying the new guidelines, the CDC stated “the *Recommendations* indicate that patients should be specifically informed that HIV testing is part of routine diagnostics, that they are being tested for HIV, and that they have an opportunity to ask questions. Most importantly, the *Recommendations* strongly emphasize that patients should be given a clear option to decline or opt-out of HIV testing.”⁵⁵

Testing in the Correctional Setting

Twenty-one state prison systems reported testing all inmates for HIV at admission, during incarceration or just before release. Sixteen states and the Federal Bureau of Prisons reported testing inmates belonging to “high-risk” groups. Most state (40–45) correctional systems and the federal system reported testing inmates when they requested or were involved in an incident with the potential for HIV transmission.⁵⁶ The CDC recommends universal opt-out testing for the correctional population as the ideal approach.⁵⁶ Recognizing, however, that because of costs and logistics (such as the rapid turnover found in jails) alternative approaches that include screening for and testing higher risk inmate populations may be considered. For those correctional systems electing not to provide universal opt-out testing, the CDC recommends those systems collaborate with local public health entities in developing screening strategies that would identify the greatest number of unidentified HIV infections. Thorough and helpful additional information is available in CDC’s *HIV Testing Implementation Guidance for Correctional Settings*, published January 2009 and available online at www.cdc.gov.

Testing for Acute (Recent) HIV Infection

Testing for HIV RNA—Nucleic Acid Amplification Test

Recent or acute HIV infection is rarely recognized.⁵⁷ During the first four to five weeks—in some cases as long as three

Testing for Acute (Recent) HIV Infection (cont.)

months—after infection, the immune system does not produce enough anti-HIV antibodies that can be detected by standard tests. Acute HIV infection (AHI), however, can be recognized by directly detecting HIV RNA or one of HIV's proteins (antigen). North Carolina and San Francisco have added nucleic acid amplification tests (NAAT) to detect those people who are HIV+ but test negative in standard antibody tests.

In North Carolina, to minimize the costs of large scale NAAT testing—all samples testing negative with standard antibody tests were to be sent for NAAT testing—90 individual samples were pooled together and tested at one time. If the results were positive, then individual pools of ten were then tested followed by individual tests. In this way, 109,250 persons were tested in North Carolina in 2002–2003.⁵⁷ The costs of implementing large-scale NAAT testing added 3% to North Carolina's HIV-related budget. The added cost reflected a cost of \$3.63 for each tested sample.⁵⁷

Fourth Generation Antigen/Antibody Tests

Another approach for detecting acute HIV infections involves testing for both HIV p24 antigen and anti-HIV antibodies (Ag/Ab). HIV p24 antigen is the most common protein made by HIV that is found in blood. Two such tests—the Determine® HIV-1/2 Ag/Ab combo (a rapid point-of-care test) and the Architect® HIV Ag/Ab combo (an assay

Testing for Acute (Recent) HIV Infection (cont.)

widely used in Europe)—are very sensitive to detecting early HIV infection⁵⁸ and should soon be available in the U.S.⁵⁹

Identifying acute HIV infection is important for two main reasons:

- After becoming aware of their HIV infection, a majority of persons substantially decrease the risk behaviors that are likely to transmit HIV to others.⁶⁰ This potential reduction in HIV transmission is particularly significant during the acute infection phase when the newly HIV-infected individual is 8 to 10 times more infectious than during the long chronic phase that follows.⁶¹
- Short-term antiretroviral treatment, administered during or within six months of acute infection, may be beneficial and is currently being assessed in clinical trials.⁶²

Testing for Established Infection

Enzyme Immunoassay and Rapid Tests

When a person provides a blood sample to be tested for HIV infection, the blood sample is either sent to a laboratory for analyses or tested on-site using rapid tests.⁶³ A rapid test using oral fluid is also available. These tests look for the presence of anti-HIV antibodies produced by the person's immune system.

For the laboratory-based test, called an enzyme immunoassay (EIA), the person provides blood drawn from a vein and needs to return to the healthcare setting to

Testing for Established Infection (cont.)

get their results. Many persons, however, do not return for their results: 30% of persons testing positive for HIV in the U.S. during 2000 did not return, as well as 39% of those testing negative.⁶⁴ A point-of-care rapid test addresses this problem by making the results available within 10 to 30 minutes. Four of the six rapid tests currently in use in the U.S. only need a drop of blood from a fingerstick.⁶³ One test uses a fluid sample from the mouth.⁶³ The oral test, however, appears to be less sensitive at detecting recent HIV infections than the tests using blood samples and may, therefore, be less appropriate for use in high-risk settings.^{58,59}

Confirmatory Tests

Negative results from all tests do not need further testing except when the person being tested reports possible HIV exposure within the past three months—a later repeat test is then recommended.⁶³ A positive result is considered preliminary and confirmatory tests are needed.

All positive tests results must be confirmed using Western Blot, an RNA test, or an immunofluorescence assay. A small proportion of these secondary tests result in an indeterminate result in which case the person should be retested after one month.⁶³

HIV Counseling

Counseling associated with HIV testing has two aspects: information and prevention counseling. All testing settings should provide information that can be given either by a counselor or through brochures, pamphlets or video. This information typically includes information about the test, the test results, how HIV is transmitted, where to obtain further information, services, and if applicable, HIV prevention counseling.⁶⁴

In 2006, the CDC revised its recommendations to make HIV prevention counseling in a healthcare setting optional. This change was made in recognition that healthcare settings are usually very busy and not having to provide counseling would facilitate the routine testing of their patients. CDC, however, continues to support prevention counseling in all settings for persons with high risk of HIV infection and in non-medical settings. Prevention counseling is focused on HIV risk reduction and typically includes in-depth personalized risk assessment, discussion and support of behavior change.⁶⁴

In the correctional setting, the same recommendations apply in regards to providing information and counseling to inmates. Inmate-led prevention interventions have been found effective as they foster greater mutual trust and cooperation.⁶⁵ Centerforce, for example, has been training California prison inmates as peer educators since 1986.⁶⁶ They provide 30 hours of training over five days and the peer educators are then hired by the program to work as full-time paid employees. Formal evaluation of the program determined that peer-led education was just as effective as professionally-led education and that inmates overwhelmingly preferred HIV+ educators. Peer-led education is also cost-effective.⁶⁶

HIV Treatment

Treatment Goals As the elimination of HIV infection is not possible with current treatment methods, the primary goals of antiretroviral therapy are to reduce HIV-related deaths, prolong survival, improve the functioning of the immune system, increase quality of life, suppress viral load, and prevent mother-to-child transmission.⁶² As lowered viral loads are associated with lower transmission probabilities, treatment may also provide the public health benefit of diminishing HIV transmission.

When to Begin Treatment CD4+ T-cell count—in absolute numbers and as a percentage of white blood cells (WBC) and lymphocyte cells—serves as the major indicator of immunodeficiency in patients and is the most important factor in deciding when to initiate antiretroviral therapy (ART) as well as treatment to prevent opportunistic infections.

The latest U.S. Department of Health and Human Services (HHS) guidelines⁶² generally recommend initiation of ART in patients with:

- A history of AIDS-defining illness, or
- A CD4 count less than 350 cells/mm³.

ART is also recommended, regardless of CD4 count for:

- Pregnant women;

When to Begin Treatment (cont.)

- Patients with HIV associated kidney disease (HIVAN—more common in African American than in White patients);
- Patients co-infected with and needing treatment for Hepatitis B.

Some experts may begin ART with a CD4+ T-cell count greater than 350 cells/mm³ when taking into consideration viral load or if there is rapid decline in CD4+ T-cells.⁶² A study in the April 30, 2009 issue of the New England Journal of Medicine indicates that beginning therapy with CD4+ T-cell counts greater than 350 and 500 leads to lower mortality.

ART During or After the Acute Phase

The application of ART during or within six months after the acute phase that occurs generally within the first month after HIV infection, when viral load is very high—before the natural suppression by the immune system—is an option being investigated with current trials. The potential benefits of lessening HIV establishment, helping to preserve the immune system, and slowing disease progression rates as well as lowering the high HIV load associated with high transmission probabilities, are being measured and compared to the risks associated with ART.⁶² HHS suggests that clinicians and patients choosing ART at this time consider participating in clinical trials listed at www.clinicaltrials.gov.

Lifelong Monitoring

The HHS guidelines recommend that all patients upon entering care have a CD4+ T-cell count and their HIV load measured as a baseline and every three to four months thereafter.⁶² As 6% to 16% of patients harbor drug-resistant varieties, their HIV should also be tested for drug resistance at this time and again prior to initiating therapy to help guide the appropriate drug regimen. After two to three years of continued viral suppression with a stable immune and clinical status, CD4+ and HIV measurements may be extended to every six months.⁶²

Lifelong Treatment

HIV treatment requires a lifelong commitment by the patient. In most patients, treatment interruption leads to HIV rebound and decrease in CD4+ T-cells.⁶² Adherence to ART is strongly correlated with reduced HIV resistance, increased survival and better quality of life.⁶² Patients also need to know that the first drug regimen is usually the simplest and offers the best chance of long-term treatment success with prevention of drug resistance.⁶² Education and counseling of the patient is recommended prior to the initiation of therapy.

Once treatment has begun, continued support has improved treatment adherence. This support can be found with adherence support groups, peer adherence counselors, community-based case managers, and health

Lifelong Treatment (cont.)

care team members such as nurses and social workers.⁶² Factors, known to limit adherence, including homelessness, psychiatric illnesses such as depression, and active substance abuse need to be addressed. The directly observed therapy (DOT) approach has been effective in providing treatment to active drug users. DOT is also strongly recommended for HIV-infected patients with active TB.⁶²

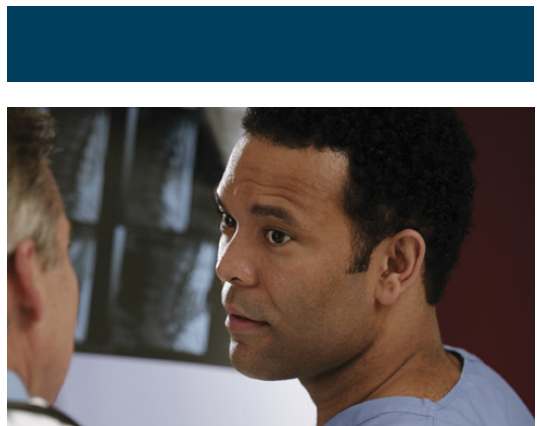
Types of Medication

There are more than 20 approved antiretroviral drugs in six classes that target different stages of the HIV infection and replication cycle. These include drugs that target HIV binding and entering the host's cells (#1 in the HIV cycle diagram), the conversion of HIV's single viral RNA into double stranded DNA (#2 in the HIV cycle diagram), and, the assembly of the HIV proteins produced by the host's DNA into new HIV (#5 in the HIV cycle diagram).



Drug-Drug Interactions

ART drug selection by the expert HIV clinician, not only takes into consideration unwanted side effects but also their interaction with each other and with other non-ART prescribed medications and over-the-counter drugs. The list of medications with adverse interactions with ART is long and is ever-increasing. These include drugs used to treat cardiac conditions, cholesterol levels, erectile dysfunction, depression and other psychiatric illnesses, and chemical dependencies and substance abuse to name a few.⁶² Methadone, used to treat opiate addiction, together with some ART drugs may diminish the effectiveness of either or both therapies. Buprenorphine also used to treat opiate addiction, on the basis of limited data, appears to have less undesirable interactions with ART drugs. Expert review of all medications taken by the patient is recommended.



HIV Myths

There are many HIV/AIDS-related myths arising from inadequate knowledge. This section will explore the myths that tend to interfere with effective HIV prevention and treatment.

1. An HIV infection is equivalent to a death sentence. Not true. Current treatment allows for an infected patient to lead a long, normal, and productive life.
2. An HIV infection can be cured—it's no big deal.⁶⁸ Not true. HIV, with current treatments cannot be eradicated from a patient's body and without continuity of treatment will rebound and lead to disease progression and AIDS. While current drug treatments are easier to take than previously, they still have significant side-effects and need to be taken every day for an entire lifetime. Claims of miraculous cures and drugs may prevent seeking effective treatment.
3. An HIV-infected pregnant woman will pass on the infection to the baby. Not true. A pregnant woman that is treated for HIV infections has a 2% chance of transmission. Without therapy HIV is transmitted in 25% of births.⁶⁹
4. Oral sex is safe. Not true. Although much less likely to transmit HIV than other types of sex, oral sex with a man or a woman can lead to infection.^{70,71}
5. Abstinence-only programs will prevent HIV infections. Not true. Studies have shown that abstinence-only programs have been ineffective in altering sexual behavior.¹⁹ Adolescents who had taken the pledge of abstinence until marriage compared to matched non-pledgers did not, after five years, differ in the frequency of pre-marital sex, number of sexual partners, type of sex (including anal and oral), and acquisition of STDs. Pledgers, however, were less likely to use protection and were more vulnerable to unintended pregnancies and STDs.²⁰ Objections on scientific and ethical grounds to abstinence-only programs have come from major U.S.-based professional

organizations⁷² including the American Academy of Pediatrics,⁷³ the Society for Adolescent Medicine,⁷⁴ the American Medical Association,⁷⁵ and the American Public Health Association.⁷⁶

6. HIV-infected partners do not need to use condoms when having sex with each other. Not true. Six to 16 percent of individuals harbor drug resistant HIV strains⁶² that can infect the partner making treatment problematic and adversely affecting treatment outcomes.⁶⁹
7. HIV only affects gay men and IV drug-users. Not true. HIV incidence is increasing most in women, particularly in women of color and in disadvantaged communities. Fourteen percent of men acquired their infection in 2007 through heterosexual sex. Women acquire their infections primarily though heterosexual sex.
8. HIV can be transmitted through casual contact with an HIV-infected person. Not true. Transmission can only occur with exposure to blood, semen, vaginal fluids, and breast milk. Evidence indicates that HIV is not transmitted through touch, sweat, tears or saliva or through contact such as touching, hugging, kissing, using eating utensils, touching doorknobs, or breathing the same air as the HIV positive person.⁷⁰
9. HIV can be transmitted through mosquito bites. Not true. Studies in areas with high AIDS and mosquito prevalence do not support this myth. Mosquitoes and other insects do not inject the blood of one person into another when they bite.⁷⁰
10. Anti-retroviral drugs are toxic and worse than HIV.⁶⁸ Not true. Drugs treatments are constantly improved and made safer. And since the availability of treatment, mortality due to HIV infection and AIDS has been reduced by 80%.

Recommendations for Managing the Continuum of Care

In an effort to assist F/CBO's and corrections personnel in managing the continuum of care from prisons, jails, and other detention facilities to the community, this section begins with issues related to testing, counseling, and treatment specific to the correctional setting and the transition to the community. Description and contact information for some existing programs providing transitional services to those in prisons and jails are offered as potential resources to F/CBOs and correction officials. Additional information can also be found in the National Minority AIDS Council's booklets *Hitting the Bricks: Successful Reentry of Offenders Living with HIV/AIDS and Mental Health and Substance Abuse Among Offenders with HIV/AIDS*.

Testing and Counseling in the Correctional Setting

Privacy and confidentiality are issues emphasized in the CDC's January 2009 *HIV Testing Implementation Guidance for Correctional Settings*.⁵⁶ Corrections staff should be familiar with the confidentiality laws in their state and be trained on how to maintain privacy and confidentiality. Practical advice includes: providing HIV testing as part of routine medical services; providing HIV and other medical test results in private, disclosing medical information only to those involved in health-care and prevention services to inmates or as required by legislation; using identification numbers instead of names on HIV test specimens, databases or log books; securing all health-related files in a locked drawer or room; not having distinct waiting and testing areas related to HIV; to name a few. Inmates testing positive for HIV should be provided with prevention counseling services, referral for mental health support as needed, and referral to an HIV provider or specialist. Important additional information and recommendations can be found in the guidelines.

Treatment An inmate diagnosed with HIV infection should undergo an immediate medical evaluation to determine HIV stage and the presence of co-occurring diseases. The CDC guidelines suggest the HIV Medicine Association of the Infectious Diseases Society of America at www.hivma.org as a source for a list of diagnostic and testing procedures. At a minimum, a CD4+ T-cell count and an HIV viral load test should be ordered by the medical provider.⁵⁶ Since interruption of antiretroviral treatment may result in HIV resistance to the medications, the inmate, upon release, should be given enough medication to last until he or she can see a community health provider.⁵⁶

Addressing Obstacles to Continuity of Treatment

The about to be released inmate is confronted with difficult challenges which may overwhelm the orderly continuity of treatment. A study of all HIV+ inmates receiving ART released from Texas prisons from 2004 to 2007 found that 70% did not fill their ART prescription within 60 days after their release.⁷⁷ Finding a stable and safe place to live is one of these challenges—almost a third of the adults entering homeless shelters in New York City were recently released from correctional institutions.⁷⁸ Food, cash to cover basic needs, employment, mental health and substance abuse treatment are other pressing challenges that need to be addressed, preferably pre-release, as part of a discharge planning program⁵⁶ and continued post-release. Evidence indicates that discharge planning programs has the additional benefit of reducing the rate of recidivism.⁵⁶

Programs Providing Transitional Services to Inmates

Programs Related to Prisons

Project START is the only intervention, for those incarcerated, listed in CDC's *2008 Compendium of Evidence-Based HIV Prevention Interventions*.^{79,80} This program seeks to eliminate or reduce risk behaviors for HIV, STDs and hepatitis among young men soon to be released from prison.⁸⁰ This program includes aspects of prevention case management, motivational interviewing, and incremental risk reduction. Enhanced interventions started with two sessions within two weeks prior to release and continued with four individual sessions at 1, 3, 6, and 12 weeks after release. The two, in-prison sessions include: 1) a brief assessment of the participant's HIV-risk and knowledge of HIV/AIDS, STDs and hepatitis, 2) incremental risk reduction planning, and 3) reentry needs such as referrals to housing, employment, substance abuse, and mental treatment. After release, the sessions included a review of the previous sessions with additional discussion on implementing the agreed on risk-reduction plan. With funding from the CDC, a Project Start intervention package is being developed by Barry Zack at the Bridging Group.*

Project Bridge is an intensive case management program of the Miriam Hospital outpatient clinic in Providence, Rhode Island, which is affiliated with Brown University. The hospital already has physicians providing HIV care in the state's prisons, but expanded their services

* For further details email: barryzack@thebridginggroup.com

**Programs Providing
Transitional
Services to Inmates
(cont.)**

to include continuity of care for HIV positive inmates returning to the community. This program combines discharge planning prior to release with intensive post-release follow-up for eighteen months. All their clients have a history of substance abuse. They assign a social worker who becomes involved with treatment planning, medical services, and who accompanies clients to each medical appointment. A paraprofessional assistant is also assigned who teaches basic life skills and accompanies the clients applying for social services.⁸¹

Programs Related to Jails

As the vast majority of those incarcerated in any single year are found in jails—13 million people were incarcerated in jails in 2007, of which 7.4 million were from communities of color⁸²—programs have been funded to address the HIV/AIDS needs of this population. The Enhancing Linkages to HIV Primary Care and Services in Jail Settings Initiative⁸³ is funded by the U.S. Health Resources and Services Administration (HRSA), HIV/AIDS Bureau, Special Projects of National Significance. The object of this initiative is “to design, implement and evaluate innovative methods for linking persons living with HIV/AIDS who are in jail settings or have been recently released from local jail facilities to primary medical care and ancillary services. Interventions include flexible and suitable case management strategies that promote

**Programs Providing
Transitional
Services to Inmates
(cont.)**

durable linkages and follow up as the person moves between jail and the community.⁷⁸³

According to HRSA, “Correctional systems have an opportunity to provide coordinated prevention and treatment interventions for infectious diseases in concert with local public health officials. Many people released from jails have serious, unmanaged infectious diseases and mental illnesses. Public health and safety could be improved through greater collaboration among correctional facilities, public health agencies, and community-based organizations. Ideally, proven interventions would be initiated with inmates and coordinated upon their release.”⁷⁸³

Eleven projects have been funded through year 2011. The Rollins School of Public Health at Emory University in Atlanta, Georgia, and ABT Associates in Cambridge, Massachusetts, coordinates the multi-site evaluation of the initiative.⁸⁴ More information can be found below. Contact and other information for six of these programs (those with websites) can be found through the links below each program.*

Emory University, Atlanta, Georgia
Evaluation and Support Center for Models of Identifying HIV Infected Persons in Jail Settings and Enhancing Linkages to HIV Primary Care <http://enhancelink.org/>

* More information for all the programs related to the HRSA initiative can be found at: <http://enhancelink.org/>.

**Programs Providing
Transitional
Services to Inmates
(cont.)**

*AID Atlanta, Inc., Atlanta, Georgia
Enhanced Care for HIV + Jail Releases
<http://www.aidatlanta.org/>*

*Care Alliance Health Center, Cleveland, Ohio
Enhancing Linkages to HIV Primary Care
& Services in Jail Settings Demonstration
Models [http://www.carealliance.org/
serviceshiv.html](http://www.carealliance.org/serviceshiv.html)*

*AIDS Care Group, Chester, Pennsylvania
Demonstration Model of Innovations in
Prisoner Release
<http://www.aidscaregroup.org/>*

*Yale University AIDS Program, New Haven,
Connecticut
TRANSITIONS [http://cira.med.yale.edu/
research/project_page.asp?projID=477](http://cira.med.yale.edu/research/project_page.asp?projID=477)*

*Philadelphia FIGHT, Philadelphia,
Pennsylvania
The Healthcare Linkage Program [http://
www.fight.org/](http://www.fight.org/)*

*Other Programs Related to Prisons and Jails
Additional community-based reentry
programs related to jail and prisons can
be found at the Reentry National Media
Outreach Campaign Web site: [http://www.
reentrymediaoutreach.org/resourceguide.htm](http://www.reentrymediaoutreach.org/resourceguide.htm)*

Conclusions

An effective response to arrest the spread of HIV/AIDS begins by supplying at-risk individuals with information and continues with prevention counseling, testing, and treatment. Every one of these interventions is essential and, together, act to prevent the further spread of HIV/AIDS. Collaboration between correctional officials, F/CBOs, and local and state public health departments is an essential factor that enables the provision of effective services to the large population involved with the U.S. correctional system.

Resources

General HIV/AIDS Resources, Including Communities of Color

- National Minority AIDS Council website: www.nmac.org; phone: (202) 483-6622
- Centers for Disease Control and Prevention (CDC): www.cdc.gov/hiv/
- AIDS.gov Web site: www.aids.gov
- AIDSinfo (HHS). <http://aidsinfo.nih.gov/> Health information specialists provide customized, confidential answers to questions about HIV/AIDS clinical trials and treatment. Spanish-speaking health information specialists are available. Call: 1-800-448-0440, Monday to Friday from 12:00 p.m. to 5:00 p.m. (Eastern Time). Real time, online assistance, Monday to Friday 12:00 p.m. to 4:00 p.m. (Eastern Time), is also available at their website: <http://aidsinfo.nih.gov/LiveHelp/>
- National Prevention and Information Network (NPIN): www.cdcpin.org/
- The Body: The Complete HIV/AIDS Resource Web site: www.thebody.com

Additional resources can be found in the NMAC booklets: *Hitting the Bricks: Successful Reentry of Offenders Living with HIV/AIDS* and *Mental Health and Substance Abuse Among Offenders with HIV/AIDS*.

Glossary⁸⁵

AHI—Acute HIV Infection. Also known as primary HIV infection (PHI). The period of rapid HIV replication that occurs two to four weeks after infection by HIV.

AIDS—Acquired Immunodeficiency Syndrome. A disease of the body's immune system caused by the human immunodeficiency virus (HIV). AIDS is characterized by the death of CD4 cells, an important part of the body's immune system, which leaves the body vulnerable to life-threatening conditions, such as infections and cancers.

ART—Antiretroviral Therapy. Treatment with drugs that inhibit the ability of retroviruses, such as HIV, to multiply in the body.

CD4—Also known as helper T-cell or CD4 lymphocyte. A type of infection fighting white blood cell that carries the CD4 receptor on its surface. CD4 cells coordinate the immune response, which signals other cells in the immune system to perform their special functions.

CD4+ T-cell – see CD4

Coreceptor—A protein on the surface of a cell that serves as a second binding site for a virus or other molecule.

DNA—Deoxyribonucleic Acid. Chemical structure that contains the genetic instructions for reproduction and protein synthesis for all cells and for many viruses.

Directly Observed Therapy (DOT)—A treatment strategy to ensure adherence, in which a health care provider or other observer watches a patient take each dose of a drug.

HIV—Human Immunodeficiency Virus.

HIV Viral Load—The amount of HIV RNA in a blood sample, reported as number of HIV RNA copies per milliliter of blood plasma.

NAAT—Nucleic Acid Amplification Test. A laboratory test that can detect very small amounts of specific genetic material in blood, plasma, or other tissue.

Nucleic Acid—Chemical structure that stores genetic information. There are two types of nucleic acid, DNA and RNA.

Receptor—A protein on the surface of a cell that serves as a binding site for substances outside the cell, such as HIV floating free in the blood.

RNA—Ribonucleic Acid. Chemical structure that carries genetic instructions for protein synthesis. Although DNA is the primary genetic material of cells, RNA is the genetic material for some viruses such as HIV.

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