AMERICAN ACADEMY OF CLINICAL SEXOLOGISTS

UNDERSTANDING HIV PREVENTION, CARE, AND TREATMENT WHEN WORKING WITH LATINO MSM

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DOCTOR OF PHILOSOPHY

BY

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DISSERTATION APPROVAL

This dissertation submitted by Teresa Neira has been read and approved by three faculty members of the American Academy of Clinical Sexologists.

The final copies have been examined by the Dissertation Committee and the signatures which appear here verify the fact that any necessary changes have been incorporated and that the dissertation is now given the final approval with reference to content, form and mechanical accuracy.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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Aside from my professional goals I intend to travel the world and be exposed to different people and ways of living. I am fascinated by the arts and take particular interest in film and photography. There is a beautiful world out there waiting to be captured by the talent of an artistic eye. I hold family as the most important element of my life since without them my life would lack color.

ABSTRACT

This paper explores the impact that HIV/AIDS has had on Latino MSM population. It attempts to provide a comprehensive understanding of prevention, care, and treatment when working within this community. Studies are included that delineate psychosocial and socioeconomic barriers to care.

To reduce the rate of HIV infection, prevention efforts must be designed with respect for the many differences among MSM and with recognition of the discrimination against MSM and persons infected with HIV in many parts of the country. Latino MSM in particular suffer great disparities due to social and economic factors, including racism, homophobia, poverty, and lack of access to health care. These become barriers to receiving HIV prevention services.

Research has shown that the combined effects of depression, childhood sexual abuse, substance use, and partner violence have been shown to increase the practice of risky sexual behaviors and compound the problem. The awareness of this type of research will result in more precise prevention efforts for Latino MSM.

Understanding the historical perspective of HIV and the impact that it had on the MSM population can yield answers to some of the devastating issues faced by this community.

This paper attempts to challenge those involved in HIV care to develop effective, culturally competent services and supports for Latino MSM population. This is a call to the Latino community leaders to promote dialogue about issues of sexual orientation to overcome social barriers and control this epidemic within their communities.

CONTENTS

CHAPTER 1

Introduction

In the United States, HIV infection and AIDS have had a tremendous effect on men who have sex with men (MSM). The (MSM) refers to all men who have sex with other men, regardless of how they identify themselves (gay, bisexual, or heterosexual). In the United States, HIV and AIDS have had a tremendous impact on MSM. MSM accounted for 71% of all HIV infections among male adults and adolescents in 2005. Additionally, racial disparities exist with regard to HIV diagnoses within the MSM population (CDC, 2007, HIV/AIDS among MSM). The recent overall increase in HIV diagnoses for MSM, coupled with racial disparities, strongly points to a continued need for appropriate prevention and education services tailored for specific subgroups of MSM, especially those who are members of minority races/ethnicities (CDC, 2007, HIV/AIDS among MSM).

The Latino community is the fastest growing population in the US and the group with the second-highest risk for HIV/AIDS (The Henry J. Kaiser Family Foundation, 2003). Between 1990 and 2000, the Latino population in the US has increased by 57.9%—from 22.4 million to 35.3 million (U.S. Bureau of the Census, 2000). Latinos are a diverse group consisting of a mix of ethnic groups and cultures. The largest Latino groups are Mexicans, followed by Puerto Ricans, Central and South Americans, Cubans, and other Latinos from the Caribbean (U.S. Bureau of the Census, 2000). Latino men represent more than half of new infections, 3 of every 5 new AIDS cases in men were among minorities (63.8%) (Care Act, 2003).

The percentage of new AIDS cases among Latinos has increased in the last 15 years (CDC, 2002). Latinos receive an AIDS diagnosis within 12 months of learning their HIV status (CDC, 2003). HIV transmission occurs more frequently among Latino males because of male-to-male sexual contact and among Latino women through heterosexual contact (Levy, 2005). Of the 918,286 AIDS cases reported to CDC through 2004, Hispanics accounted for 19% of total. Of AIDS cases reported in 2004, 21% were among Hispanic adults and adolescents (CDC, 2004).

There are cultural characteristics that increase HIV vulnerability among Latino MSM such as gender inequity, machismo, homophobia, drug or alcohol abuse, stigma associated to the disease, predetermined roles and family pressures, infidelity as part of the male social role and passive acceptance by female partners as well as domestic violence (Galanti, 2003).

The consequences of homophobia in Latino MSM make them vulnerable to HIV infection. Homophobia has been shown to lead to depression, low-self-esteem, drug use, and denial, which in turn leads to high risk behaviors (Diaz, R. 2001). For many the process of acceptance of being homosexual is more difficult than being HIV positive.

In a study conducted by Diaz, Ayala, Bein, Henne and Marin, (2001), they explored the relation between experiences of social discrimination (homophobia, racism, and financial hardship) and symptoms of psychological distress (anxiety, depression, and suicidal ideation) among Latino MSM in the United States. The study consisted of 912 Latino men recruited in 35 Latino gay bars across New York, Miami, and Los Angeles. In addition, 22% reported being HIV positive. When asked about their experiences of homophobia 64% reported they had to pretend to be straight and were made fun of as

children, 91% grew up thinking gays were not normal and 71% that gays grew old alone, and 70% felt their being gay hurt their families. The study found high prevalence rates of psychological symptoms of distress including suicidal ideation (17% prevalence), anxiety (44%), and depressed mood (80%). In both univariate and multivariate analyses, experiences of social discrimination were strong predictors of psychological symptoms.

When someone is stigmatized the person affected is seen as responsible for having the illness. The disease is seen as progressive and incurable. There are a lot of myths and misconceptions and the disease is not well understood. The person who is stigmatized is reduced from a whole person to a tainted discounted one (Goofman, E. 1963). There is a lot of stigma within the Latino community revolving HIV/AIDS. Being infected is often seen as a deeply discrediting attribute within the community. It is common for the Latino communities to hold unfavorable attitudes, beliefs and policies directed toward people perceived to have HIV/AIDS, as well as their loved ones, associates, and social groups (Seaton, 2003).

Latinos also face unique issues related to access to healthcare coverage and HIV care. The impact of HIV/AIDS on Latinos is part of the broader disparities in access to healthcare services. In 2000, 1 in 3 Latinos (32%) were uninsured (Census, 2000) 30% reported having no regular source of healthcare and inability to pay for care as their major obstacle (Morales, 2004). Poverty and unemployment are a real problem in the Latino community. Nationally, 21.4% of Latinos in live in poverty and 24% are uninsured (US Census Bureau, 2002). These numbers may be much higher due to the high numbers of Latinos that are undocumented and do not report to the census.

Lack of education and language barriers can also impede access to care. Nationally, 43% of Latinos over 25 years of age have not graduated from high school (US Census Bureau, 2003). About one third of Latinos in US are monolingual and do not speak English (US Census Bureau, 2000). Several studies have shown the importance of English language proficiency and the ability to understand medical instructions (Essien, Meshack, & Ross, 2002). One in 5 Latino's have gone without care when needed due to language obstacles (Wirthlin Worldwide Project. 2001).

Delayed presentation which is common among Latinos can lead to disproportionately high number with AIDS (Turner, 2000). Latinos presenting with advanced disease at diagnosis have high baseline viral load, impaired immune status, increased morbidity, higher incidence of hospitalization for opportunistic infections, and increased mortality (Swindells, Cobos, Lee, Lien, Fitzgerald, & Pauls, 2002).

Immigration is a growing issue in HIV care. There are an estimated 3 to 6 million Mexicans undocumented in the US (Lowell, 2002). One fourth of the AIDS cases in Mexico are among persons who have spent prolonged periods in the US (Rangel & Lozada, 2002). AIDS statistics in Mexico report a slight trend toward ruralization of AIDS that might be linked to male migration to US (Magis-Rodríguez, 1998). The limited data on HIV infection in Mexicans living in the US suggests that the groups that have been most greatly affected are MSM. Of the US AIDS cases reported in 2000 among persons born in Mexico, 44% were among MSM, 14% among heterosexuals, 9% among IDUs, and 3% among MSM IDUs, not known 29% (Centers for Disease Control. 2001).

There are also migration related risk factors to HIV infection in the Latino community. Some of these risk factors include constant mobility, cultural issues, language barriers, lack of access to healthcare services, changes in sexual practices, limited education (Organista, 1997). There are also psychosocial factors to consider such as isolation, discrimination, poverty, chronic underemployment, and substandard housing (Organista, 1997). All of these factors put the Latino community at a higher risk for infection. In addition to these risk factors there are behaviors and practices that put Latinos at higher risk of HIV infection. One of these behaviors is adoption of new sexual practices. Latinos may seek companionship to compensate for the alienating aspects of the migration experience, fewer constraints or social control on behaviors, exposure to previously unknown or unacceptable sexual behaviors and practices, exchange sexual services for money, food, or lodging (Kaiser Network, 2004). Another issue is low levels of knowledge relating to the mechanisms of HIV infection and prevention, adoption of multiple partners, low condom use, increased alcohol and drug use related to the migration experience, and limited access to medical care and HIV testing (Kaiser Network, 2004).

Access to basic needs may help to reduce HIV risk, morbidity, and mortality among Latino immigrants (Bronfman, 1996) Issues such as healthcare, housing, employment need to addressed. Culturally relevant educational and training materials in Spanish. Educational programs tailored for the needs of immigrants. HIV surveillance must be improved to understand the scope of HIV among Latino immigrants (Bronfman, 1996).

In order to improve healthcare services for Latino MSM's treatment services must take into account that Latinos appreciate mutual respect in social relationships, especially with authority figures. Latinos strive to preserve personal integrity in interactions with others. A Latino receiving medical or drug treatment must feel that he or she is treated with respect and valued, or they will reject treatment (Smedley, Stith, & Nelson, 2002). Latinos have a different perception of time, with a more flexible understanding of punctuality. Saving time is seen as less important than smooth, warm social relationships. A Latino patient may see as rudeness a hurried pace or focus on saving time on the part of a caregiver. Emphasis on the family as the primary social unit and source of support, known as Familismo (Marin & Gomez, 1994). In addition Simpatía which is the importance in the culture of polite and cordial social relations (central cultural value and social expectations) (Marin & Gomez, 1994). The Latino culture shuns assertiveness, direct negative responses, and criticism. Personalismo is the Latino's preference for relationships with others that reflect a certain familiarity and warmth (Marin & Gomez, 1994). Latinos may be more likely to trust and collaborate with someone with whom they had pleasant conversations. Providers can seem extremely cold and professional (Marin & Gomez, 1994).

It is important to have cultural competence when dealing with Latino MSM's in HIV care (Donini- Lenhoff & Hedrick, 2000). Having cultural competence involves being aware and accepting of others differences, being aware of own cultural values and dynamics of differences, being proactive in our own development of cultural knowledge, being able to work within other's cultural context, having a healthy self-concept and

being free from ethnocentric judgment (Donini- Lenhoff & Hedrick, 2000). All of these things are essential in order to provide culturally competent services.

CHAPTER 2

History of AIDS in the United States

Year: 1981

In 1981 doctors in New York were reporting a few isolated cases of Karposi's Sarcoma (a rare skin cancer) in 8 of their patients. At about the same time there was an increase in Pneumocystis carinii pneumonia (PCP) (a rare lung infection) in New York and California. These patients all had one thing in common, they were gay, acquiring the designation Gay-Related Immune Deficiency (GRID). It was not until 1982 that the anagram of AIDS was created as doctors felt it was a more appropriate name because people acquired the condition rather than inherited it; because it resulted in a deficiency within the immune system; and because it was a syndrome, with a number of manifestations, rather than a single disease (Connor, & Kingman, 1988).

Year: 1982

By the end of 1982 it started turning up in children and transfusion recipients and more people began to take notice as it became apparent that AIDS affected non-homosexuals as well. A that time little was known about transmission and the theories abounded. There was much public anxiety about how and who could get AIDS. It was also becoming clear that AIDS was not a disease that just occurred in the USA. Throughout 1982 there were separate reports of the disease occurring in a number of European countries (Rozenbaum, & Francioli, 1982, 1982). Meanwhile in Uganda, doctors were seeing the first cases of a new, fatal wasting disease. This illness soon became known locally as slim (Serwadda, Mugerwa, & Sewankambo, 1985).

Year: 1983

In March 1983, the CDC stated that persons who may be considered at increased risk of AIDS include those with symptoms and signs suggestive of AIDS; sexual partners of AIDS patients; sexually active homosexual or bisexual men with multiple partners; Haitian entrants to the United States; present or past abusers of IV drugs; patients with hemophilia; and sexual partners of individuals at increased risk for AIDS (Marx, 1983). This was extremely detrimental and stigmatizing to those groups. AIDS was believed to be sustained in these groups and contact with them could make the epidemic spill over to other groups. Transmission became a major issue and instances of discrimination were widespread.

Although progress was being made by scientists, there was increasing concern about transmission through casual contact after a report on AIDS occurring in children suggested it (Olestke, 1983). In New York landlords would evict people they suspected had AIDS and the Social Security Administration would conduct their interview with AIDS clients over the phone instead of face to face. In San Francisco, the Police Department equipped patrol officers with special masks and gloves for use when dealing with a suspected AIDS patient. The officers were concerned that they could bring the bug home and their whole family could get AIDS (New York Times, 1983).

In November 1983 it was reported by the European World Health Organization (WHO) that AIDS was present in the U.S.A., Canada, fifteen European countries, Haiti and Zaire as well as in seven Latin American countries. There were also cases reported from Australia and two suspected cases in Japan (Who, 1983).

Researchers continued to investigate the cause of AIDS. The Institute Pasteur in France reported that they had isolated found the cause of AIDS. The virus was named lymphadenopathy-associated virus or LAV, patents were applied for, and a sample of LAV was sent to the National Cancer Institute.

Year: 1984

In 1984 about a year after the French, the United States Health and Human Services Secretary Margaret Heckler announced Dr. Robert Gallo of the National Cancer Institute had isolated the virus which caused AIDS, that it was named HTLV-III, and that there would soon be a commercially available test able to detect the virus and that a vaccine would be ready in 2 years (Office of Technology, 1985). Although patents were applied for, there was clearly a possibility that LAV and HTLV-III were the same virus.

Year: 1985

By March 1985 it was clear that the viruses were the same (Marx, 1985). The same month the U.S Food and Drug Administration licensed the first blood test for AIDS. The test would reveal the presence of antibodies to HTLV-III/LAV, and it was announced that anyone who had antibodies in their blood would not be allowed to donate blood (Pear, 1985).

In April the first International Conference on AIDS held in Atlanta. The three major topics of discussion were the new HTLV-III/LAV test, the situation with regard to AIDS internationally, and the extent of heterosexual transmission (Patton, 1985). Some researchers were still skeptical that AIDS could spread as quickly in the heterosexual community as it had in the homosexual one. While still others were pointing towards research in Africa indicating equal transmission (Altman, 1985).

AIDS gained many headlines and caused alarm among the public. In some newspapers, the prejudice was obvious. The hemophiliacs were seen as the innocent victims of AIDS whereas gays and drug-users were seen as having brought the disease upon themselves. Even people who were considered innocent victims were discriminated. Some hemophiliacs were allowed to attend school, but some of the students where kept home by concerned parents. In 1985, a 13 year old boy named Ryan White became a symbol of the intolerance that is inflicted on AIDS victims. White, a hemophiliac, had contracted the disease from a tainted blood transfusion and as a result school officials banned him from attending school (Time Magazine, 1990).

Year: 1986

As the French insisted on using the name LAV, while Gallo's group used HTLV-3, The International Committee on the Taxonomy of Viruses ruled in May 1986 that both names should be dropped and the dispute solved by a new name, HIV (Human Immunodeficiency Virus) (Coffin, Haase, Levy, Montagnier, Oroszlan, Teich, Temin, Toyoshima, Varmus, Vogt, & Weiss, 1986).

In September there was dramatic progress in the treatment for AIDS, when clinical tests showed that a drug called azidothymidine (AZT) slowed down HIV. AZT was first created as an anticancer drug that later proved ineffective.

The AZT clinical trial divided patients into two groups: one received AZT and the other placebo. After six months, only one patient in the AZT group had died, while there were 19 deaths among the placebo group. The clinical trial was stopped early, because it was thought to be unethical to deny the patients of the placebo groups a better chance of

survival (Fischl, Richman, Grieco, Gottlieb, Volberding, Laskin, Leedom, Groopman, Mildvan, & Schooley, 1987).

In the United States in 1986 the government's first major statement on what the nation should do to prevent the spread of AIDS was published, the Surgeon General's Report on AIDS. The report urged parents and schools to speak about AIDS (Boffey, 1986). By the end of that year, 85 countries had reported 38,401 cases of AIDS to the World Health Organization. By region these were: Africa 2,323, Americas 31,741, Asia 84, Europe 3,858, and Oceania 395 (Bureau of Hygiene & Tropical Diseases, 1986).

Year: 1987

In March 1987 the U.S. Food and Drug Administration approved AZT as the first antiretroviral drug to be used as a treatment for AIDS (Public Health Service, 1987). The drug was administered at very high doses every four hours, forcing patients to wake up throughout the night to take their medication. AZT had high drug toxicity and numerous side effects. However, the unavailability at that time of alternatives to treat AIDS affected the risk/benefit ratio, with the certain toxicity of HIV infection outweighing the risk of drug toxicity.

Around the same time the organization ACT UP (the AIDS Coalition to Unleash Power) was founded. Their first mass demonstration was held on Wall Street on March 24th. They were committed to direct action to end the AIDS crisis, and their demands included better access to drugs as well as cheaper prices, public education about AIDS and the prohibition of AIDS-related discrimination (ACT UP, 1987).

On March 31st an agreement was reached regarding ownership of the HIV antibody test patent. The Pasteur Institute agreed that it would end its legal challenge, and

would share the profits from the test with the U.S. Department of Health and Human Services (Palca, 1987). Although the agreement officially resolved the question of who had invented the HIV antibody test, it did not address the question of who had discovered HIV and identified it as the cause of AIDS. It was generally agreed that historians would decide that (Newsweek, 1987).

The following day President Reagan made his first major speech on AIDS, when he addressed the Philadelphia College of Physicians. Reagan advocated a modest federal role in AIDS education, explaining that he favored teaching students about AIDS, as long as they teach that one of the answers to it is abstinence, “if you say it's not how you do it, but that you don't do it" (Hooper, 1987).

That same year the WHO Global Program on AIDS developed a Global AIDS that established the objectives and principles of local, national and international action to prevent and control HIV/AIDS, and it included the need for every country to have a supportive and non-discriminatory social environment (Mann, 1989)

But on May 31st President Reagan gave a speech about AIDS at a dinner of the American Foundation for AIDS Research and particularly focused on increasing routine and compulsory AIDS testing (Connor & Klingman, 1988). The following day Vice President George Bush opened the 3rd International Conference on AIDS in Washington and was booed by the audience when he defended President Reagan's HIV testing proposals. Demonstrators against the administration's policies were arrested outside the White House by police wearing long yellow rubber gloves (Simmons & Nelson, 1987). The sight of the gloves which was aired that night in national news served as a reminder that although it had been proven that you could not get infected through casual contact

there was widespread ignorance that fueled and reinforced the public's overestimation of transmission.

Prejudice against people with HIV continued in America. The story of the Ray family who lived in Florida, with 3 hemophilic, HIV positive, sons. The family was told their sons could not attend school so they moved to Alabama, and once again they were refused entry to school. Threats against the family grew stronger and more frequent, and on August 28th 1987 their house was doused with gasoline and torched (Kinsella, 1989).

In the fall, Randy Shilts authored 'And the Band Played On', which chronicled the early years of the AIDS epidemic. Shilts' book made an important contribution to documenting the history of AIDS.

In October, AIDS became the first disease ever debated on the floor of the United Nations General Assembly. The General Assembly resolved to mobilize the entire (UN) system in the worldwide struggle against AIDS, under the leadership of the WHO. The WHO also reported that an estimated 5 to 10 million people were infected with HIV worldwide, with 150,000 cases of AIDS expected to develop in the following 12 months and up to 3 million within the next 5 years (WHO, 1987).

Year: 1988

As the global mobilization against AIDS continued, a world summit of ministers of health was held in London to discuss a common AIDS strategy. The summit focused on programs for AIDS prevention, and there were delegates from 148 countries.

One outcome of the meeting was the London Declaration on AIDS Prevention, which emphasized education, the free exchange of information and experience, and the need to protect human rights and dignity (Mann & Kay, 1991) The Director-General of

The WHO chose this occasion to announce that they intended to promote an annual World AIDS Day, and the first such day would be December 1st, 1988 (WHO, 1988).

In May of 1988 the United States finally launched a coordinated HIV/AIDS education campaign. The distribution took place of 107 million copies of "Understanding AIDS", a booklet by Surgeon General C. Everett Koop (U.S Department of Health, 1988). This was the single most widely read publication in the United States in June 1988, with 86.9 million readers (Rosenberg, Tolsma, Kolbe, Kroger, Cynamon, & Bowen, 1992).

The following month the American Medical Association urged doctors to break confidentiality in order to warn the sexual partners of people being treated for AIDS. Due the public health danger, the physician now had the professional responsibility to warn partners and breach the privacy of their clients (Wilkerson, 1988).

Frustration continued to grow over the slowness of progress in improving access to drugs. When the Presidential Commission on the HIV Epidemic issued its final report in June 1988, it declared that the FDA arrangements were "not meeting the needs of people with AIDS". On October 11th ACT-UP demonstrators virtually shut down operations at the FDA headquarters (Arno & Feiden, 1992). Eight days later the FDA announced new regulations to speed drug approval (FDA, 1988).

Year: 1989

In August 1989, there were more developments with respect to treatment, when the results were announced of a major drug trial and it showed that AZT could slow progression to AIDS in HIV positive individuals with no symptoms at all. The result had enormous financial implications for the makers of the drug, Burroughs Wellcome. The

day after the press conference, the value of the company's stock rose by 32 per cent (Arno & Feiden, 1992). The high price of AZT angered many people and Burroughs Welcome were accused of price gouging and profiteering (Hiltz, 1989). In September, the cost of the drug was cut by 20% (Gorman, Thomson-Washington, & Cheryl, 1989).

In October the second drug for the treatment of AIDS, dideoxyinosine (ddI), started to be made available to people with AIDS, even though only preliminary tests had been completed (Freudenheim, 1989).

Year: 1990

In 1990, Jonathan Mann resigned as the head of the WHO AIDS program, to protest against the failure of the UN and governments worldwide to respond adequately to the exploding pandemic, and to protest against the actions of the then WHO director-general Dr. Hiroshi Nakajima (Wachter, 1991). During Jonathan Mann's leadership, the AIDS program became the largest single program in the organization's history Los Angeles Times, 1990).

On April 8th 1990 Ryan White died in the United States. He was an HIV positive hemophiliac infected through blood transfusion. He had become well known a few years earlier after fighting to be allowed to attend public school. A few months later the Ryan White CARE Act was passed by Congress. The aim of the act was to provide grants to improve the quality and availability of care for individuals and families with HIV.

In July 1990 the CDC reported the possible transmission of HIV to a patient during a dental procedure. The dentist, David Acer, had been diagnosed with AIDS three months before performing the procedure. The CDC investigation did not identify any

other risk factors or behaviors that could have put the patient, Kimberly Bergalis, at risk of HIV infection (MMWR, 1990).

By the end of 1990, over 307,000 AIDS cases had been reported to the WHO, but the actual number was estimated to be closer to a million. It was estimated that 8-10 million people were living with HIV worldwide, of whom about 5 million were men and 3 million were women (Chin, 1990).

Year: 1991

In 1991 the CDC confirmed that in addition to Kimberly Bergalis, two other patients had probably been infected by the same dentist (MMWR, 1990). As a result, America's leading medical and dental associations announced that HIV positive doctors and dentists should warn their patients if they are HIV positive or give up surgery (Altman, 1991). In the midst of continuing public hysteria, the CDC also recommended that HIV positive health care workers should be barred from certain procedures (Rosenthal, 1991).

During the summer, a third antiretroviral drug dideoxycytidine (ddC) was approved by the FDA for use by HIV positive patients intolerant of AZT (FDA, 1991)

In the UK in January 1991 the character Mark Fowler, in the BBC television series EastEnders, was diagnosed HIV-positive (Bureau of Hygiene & Tropical Diseases, 1993). In the US Earvin (Magic) Johnson announced that he was HIV positive and was retiring from basketball. He promised to use his celebrity status to help educate young people about HIV (Stevenson, 1991).

A few weeks later, Freddie Mercury, lead singer of the rock group Queen, announced that he had AIDS. Just one day later it was confirmed that he had died (The Guardian, 1991).

During 1991 the red ribbon became an international symbol of AIDS awareness.. The organization Visual AIDS, Broadway Cares, and Equity Fights AIDS, established the wearing of a red ribbon to support people living with HIV/AIDS (Gott, Thames & Hudson, 1994).

Year: 1992

In 1992 the FDA approved the use of ddC in combination with AZT for adult patients with advanced HIV infection who were continuing to show signs of clinical or immunological deterioration. This was the first successful use of combination drug therapy for the treatment of AIDS (FDA, 1992).

Year: 1993

In January 1993 it was reported that some people with AIDS had resistance to AZT even though they had never taken the drug. It was theorized that some of the patients may have gotten the virus from other patients who had developed resistance to AZT and who were now transmitting the resistant virus (New York Times, 1993).

At the beginning of the year the CDC had expanded the US definition of AIDS. The new definition included HIV positive people with opportunistic infections and a CD4 count of less than 200. The European Centre for the Epidemiological Monitoring of AIDS together with the WHO accepted the part about the opportunistic infections but not the CD4 cell count criteria (European Centre for the Epidemiological Monitoring of AIDS, 1993).

Year: 1994

In 1994 in the US the CDC broke away from their low-key approach and launched a series of bold AIDS advertisements. The advertisements highlighted the use of condoms, which were rarely seen or even mentioned on American television (Stine, 1996).

The number of AIDS cases by the summer of 1994 reported to the WHO was 985,119. The WHO estimated that total number of AIDS cases had risen by 60% in the past year from an estimated 2.5 million in1993 to 4 million in1994 (WHO, 1994). It was estimated that worldwide there were three men infected for every two women, and that by the year 2000 the number of new infections among women would be equal to that among men (WHO, 1994).

In 1994 a study showed that mother to child transmission could be decreased by two thirds while on AZT (Connor, 1994). This was regarded by some one of the most important discoveries in neonatal AIDS research. This was the first time that transmission was reduced. A year later research provided breakthrough information about the replication of HIV in the body and its affect on the immune system (Brown, 1995). Also that year, a study in Tanzania, found that treating people for sexually transmitted diseases substantially reduced their risk of becoming infected with HIV (Reuters, 1995). In September two clinical trials showed that combinations of AZT with ddI or ddC were more effective than AZT alone in delaying disease progression and prolonging life (Priority Press, 1995).

That same year the FDA approved the first of a potent new class of anti-AIDS medications, protease inhibitors. The drug Saquinavir belonged to this new family of

drugs. Its approval in record time was said to be some of the most hopeful news in years for people living with AIDS (Schwartz, 1995). These new class of drugs which would eventually be given in combination therapy would slowly change HIV from a terminal illness to a chronic disease.

Year: 1995

By 1995, a million cases of AIDS had been reported to the WHO. Eighteen million adults and 1.5 million children were estimated to have HIV since the beginning of the epidemic (WHO, 1995). That same year the CDC announced that AIDS had become the leading cause of death amongst Americans aged 25 to 44 (Altman, 1995).

By 1995 thanks to the Ryan White Care Act that was enacted in the 90's activists were replaced with thousands of AIDS organizations throughout the U.S. In July the U.S. senate voted to extend the act (Dewar, 1995).

The healthcare system was slow to diagnose HIV in women and in by the fall of 1995, it was estimated that 7-8 million women had been infected with HIV. The WHO spoke out about the inadequate international response stating that the impact of the HIV/AIDS epidemic on women was not yet receiving sufficient political awareness, commitment or enough action of programs responding to the specific needs of women (WHO, 1995). The WHO's Global program on AIDS closed as planned at the end of December 1995. They estimated that by the end of the century, 30 to 40 million people would have been affected by HIV (WHO, 1995). The WHO was replaced by the new Joint United Nations Program on AIDS (UNAIDS) bringing together six agencies under the UN system.

Year: 1996

In May 1996 the US Food and Drug Administration (FDA) approved the first home testing system of HIV. Until then the FDA had insisted that HIV testing had to be done under the supervision of health professionals. The new system empowered Americans who did not know their status to buy a testing kit, collect a sample, send it to a laboratory, and receive their results by phone (Gelb, 1996).

In June 1996 the FDA approved a new class of drugs known as non-nucleoside reverse transcriptase inhibitors the drug Viramune (nevirapine) was the first in this new class (Washington Post, 1996). Viral load tests were also introduced which provided information about the risk of disease progression and the amount of HIV in the bloodstream (FDA, 1996). The year was filled with excitement and optimism about the treatment of HIV (Cooper & Merigan, 1996). The health of many improved enormously when they started taking combination therapy. The improvement in health was so dramatic that it was referred to as the "Lazarus Syndrome" (Andriote, 1999). Some scientists began to declare that aggressive treatment with multiple drugs would eventually transform AIDS into a chronic, manageable disorder like diabetes (Maugh, 1996). There were even reports that giving combination therapy to patients in the first few weeks of infection might mean that the virus could be completely eliminated in two or three years (Alcorn, 1996). The limitations of the drugs were also reported such as pill burden, long term toxicities, and side effects.

It was not until December of that year that the White House announced its first ever AIDS strategy which called for sustained research to find a cure and a vaccine; a reduction in new infections; guaranteed access to high quality care for AIDS patients; and

fighting AIDS-related discrimination (San Francisco Chronicle, 1996). By this time AIDS was a pandemic and it was clear that it was affecting men and women of all races, ages and social status. UNAIDS estimated that during that year about three million people, most under 25, had become newly infected, making the total number 23 million. An estimated 6.4 million people, 5 million adults and 1.4 million children, had already died (Altman, 1996).

Year: 1997

A year later in 1997, Clinton pushed for the U.S. to find an AIDS vaccine within ten years proclaiming it would be the first great triumph of the 21st century. To help reach this goal Clinton announced that an HIV vaccine research and development center would be established at the National Institutes of Health (Reuters News Media, 1997).

In 1997 for the first time since the AIDS epidemic started, the number of deaths from AIDS had dropped substantially across the U.S. (Brown, 1997). In New York City specifically, the number of people dying from AIDS fell by about 50 per cent compared to the previous year (Brown, 1996). The number of babies being born HIV positive had also declined dramatically (Brown, 1997). The decline in deaths left more people living with AIDS and HIV infection. This gave rise to new programs for HIV positive people to have access to treatment and care.

It soon became clear that although antiretroviral drugs saved lives, they did have terrible and often serious side effects. Resistance to medication became an issue for patients that did not adhere to their regimen. Adherence for some patients was extremely difficult due to pill burden and severe side effects (Van Praag, Fernyak, & Katz, 1997).

A number of treatment guidelines were published. In the U.S. patients were advised to begin treatment even when they did not have symptoms (King, 1997) The U.S. approach was referred to as the "hit early, hit hard" approach to treatment (Keen, 1997).

Later in that year a number of studies showed that HIV could not be eradicated by two or three years of treatment as scientists had hoped, even if three drugs were taken and the regimen was strictly followed (Brown, 1997).

In July of 1997 the CDC reported that it was likely that there had been a case of transmission of HIV as a result of kissing, although other routes of transmission could not definitely be excluded. The HIV positive man had sores in his mouth and gum disease, and his female partner also had gum disease, both having gums that regularly bled with inflamed and sore areas in their mouth (MMWR Weekly, 1997).

Year: 1998

In 1998 in the U.S. HIV positive people began to recover their health and even go back to work as a result of combination antiretroviral drug treatment. Yet some people continued to be affected by severe side effects. One such side effect included fat redistribution called lipodystrophy. The reasons why lipodystrophy appeared in some people taking combination antiretroviral drug treatment and not others were unknown. Some reports linked the syndrome to protease inhibitors. People began to have doubts and concerns about the long term safety of anti-HIV drugs (Altman, 1998).

The mood of 1998 was of pessimism, a sharp contrast to the euphoria of the past two years. Reports about issues with anti-HIV drugs and setbacks in vaccine trials left many thinking that their best hope against the epidemic was the strategy they had since it began: prevention (Altman, 1998). The first case of a patient being infected with a strain

of HIV resistant to the new antiretroviral drugs was reported. The mutated strain of HIV, resistant to protease inhibitors and older drugs, was found in a newly infected patient in San Francisco. After much optimism it was felt that there would soon be an emergence of a dangerous chapter to the AIDS epidemic (Pearlman, 1998).

In June of 1998, AIDSvax started the first human trial of an AIDS vaccine using 5,000 volunteers from across the U.S. This opened a new era in AIDS research, and led to human trials (Francis, 1998).

In San Francisco a Post Exposure Prophylaxis (PEP) program was started giving anti-HIV drugs to people that might have been exposed to HIV through sexual contact or needle sharing. The anti-HIV drugs were given to people at the earliest possible time after the risk exposure. The treatment was given to try to stop the replication before it infects the cells (CNN, 1998). The FDA gave approval for various new drugs that year including Sustiva (efavirenz), another non-nucleoside reverse transcriptase inhibitor (FDA, 1998).

A study that year found that the combination of caesarean delivery and AZT reduced the risk of HIV transmission from a mother to child to less than 1%. The study also found that women who took AZT but delivered their babies by natural childbirth had a higher risk (6.6%) of transmitting HIV to child (Mandelbrot,1998).

Year: 1999

In 1999 Researchers at the University of Alabama claimed that a particular type of chimpanzee from Africa, was the source of HIV. The researchers suggested that HIV was introduced into the human population when hunters became exposed to infected blood (Mitchell, 1999).

That same year South Africa forced a cut in drugs prices after its battle with the United States and pharmaceutical companies. The dispute revolved on South African legislation that allowed local companies to manufacture anti-HIV drugs and sell them at a fraction of the price of similar imported products. The U.S. argued that the South African legislation violated the patent rights of the pharmaceutical companies that had manufactured the drugs (BBC News, 1999)

Later that year initial findings from a joint Uganda-U.S. study identified a new drug regimen, a single oral dose of the antiretroviral drug nevirapine, as being both affordable and effective in reducing mother to baby transmission of HIV. This research provided hope that mother to child transmission could be effectively reduced (National Institute of Health, 1999).

A survey published in August of 1999 found an increase in the amount of gay men in San Francisco having unprotected sex. The survey results provoked concern and disappointment among public health authorities because, instead of declining, the rate of new HIV infections had remained at about 500 per year (Ekstrand,1999).

A research study published in November argued that male circumcision could help to reduce HIV infection rates in Africa and Asia (Halperin & Bailey, 1999).

Year: 2000

By the year 2000 the Centers for Disease Control (CDC) reported that, for the first time, the rate of AIDS diagnoses among Black and Hispanic gay men had surpassed that of white gay men in the U.S. African Americans now comprised 57% of all new HIV infections and made up just 13% of the U.S. population (MMWR Weekly, 2000).

At the 7th Conference on Retroviruses and Opportunistic Infections held in 2000, some studies showed that temporarily stopping HIV drug therapy might not lead to increased levels of HIV virus in the bloodstream or drug resistance in some people (Waldholz M. 2003). This later became known as the structured treatment interruption or drug holiday.

That year a more definitive study was published about the risk of transmission through oral sex. Although earlier studies had identified oral sex as a means of transmission, this study was designed to ascertain the extent of HIV transmission through oral sex among men who have sex with men. The study revealed that oral sex accounted for about 7% of cases (CDC, 2000).

Other studies were reported involving nonoxynol-9. Researchers had hoped that nonxynol-9 would be the first effective microbicide that would reduce the risk of transmission through sex, but the findings were quite the opposite. Women at high risk of HIV infection were warned not to use the nonoxynol-9 because the studies showed that it might increase the risk of transmission (CDC, 2000). For many these were not new findings since the toxic effects of nonoxynol-9 had been reported since 1989 (Bird, 1991).

Also in 2000 the Clinton Administration formally declared HIV/AIDS to be a threat to U.S national security. The U.S. government felt that the global spread of AIDS was reaching catastrophic proportions that could topple foreign governments, start ethnic wars, and undo decades of work building free-market democracies abroad. This was the first time the National Security Council was involved in fighting an infectious disease (CNN, 2000).

Later in the year, the U.S. Institute of Medicine released a report that sharply criticized the Clinton Administration for failure to develop a comprehensive and effective plan to combat the disease in the United States (National Academy of Science, 2000).

In 2001 newspapers all over the world marked the 20th anniversary of the first published report on the disease that came to be known as AIDS. In just 20 years HIV/AIDS infected 60 million people, killed 22 million and achieved the status of the most devastating epidemic in human history (Kapp, 2001).

Year: 2001

According to a CDC study of six large U.S. cities by 2001 30% of young gay black men were infected with HIV (Valleroy, 2001). The CDC also reported that the rate of new HIV infections was increasing twice as fast among people aged over 50 as among younger age groups. Officials speculated that a more open society, people entering the dating scene after the monogamy of marriage, and the absence of a fear of pregnancy was causing the alarming rise in sexually transmitted infections in that age group (McVeigh, 2001).

In 2001 President George Bush appointed the first openly gay man, Scott Evertz, as Director of the Office of National AIDS Policy, but did not find any extra money in his 2002 budget for AIDS prevention or treatment (Heredia, 2001).

The US Food and Drug Administration (FDA) issued a warning letter to manufacturers of HIV/AIDS drugs, cautioning them to tone down the optimistic tone of their antiretroviral drug advertisements (Josefson, 2001). The FDA contended that images of robust individuals engaged in strenuous physical activity and healthy-looking

individuals giving testimonials of a specific drug's benefit were misleading since not all individuals responded to ARV therapy (Getty, 2001).

Year: 2002

In 2002, The US Secretary of State Colin Powell, set himself apart from President Bush's views on sex education in an MTV broadcast strongly advocating condom use to prevent the spread of AIDS and other sexually transmitted diseases. He stated that condoms were a way to prevent infection and that he not only support their use but encouraged their use among people who were sexually active (Slevin & Connolly, 2002).

That same year a study showed that about 50% of Americans still believed they could get HIV through casual contact, and most supported the mandatory testing of groups at highest risk of infection (Herek, Capitanio, & Widaman, 2002).

A landmark Spanish study found that over 19,000 instances of unprotected oral sex did not lead to a single case of HIV transmission among 135 HIV-negative heterosexuals in a sexual relationship with a person with HIV (Del Romero, 2002).

That year there were promising results from trials of T-20, an injectable drug from a new class of treatments called fusion inhibitors. The results provided encouraging news for people who had become resistant to existing drugs. This was deemed as the most exciting advance since protease inhibitors were introduced (Vass, 2002)

By 2002 the number of children orphaned by HIV/AIDS had risen three-fold since 1996 and reached an all time high of 13.4 million. India had the largest number of AIDS orphans of any other country in the world, with an estimated at 1.2 million which was predicted to rise to 2 million by 2006 and 2.7 million by 2011 (Boseley, 2002).

That same year researchers in Sweden reported the first fully documented case of HIV-positive man who was additionally infected with a second strain of HIV through unprotected sex more than two years after he was first infected (Goulder & Walker, 2002).

By 2002 the face of HIV/AIDS had become that of a young African woman. Seven out of ten people living with the HIV were in Africa, and 58% of infected Africans were female. Of the 38.6 million adults living with the disease worldwide, 19.2 million were women (Farley, 2002).

The US Agency for International Development (USAID) announced in December 2002 its new approach to preventing transmission of HIV around the world. The new approach would be known as "ABC" (Abstinence, Being faithful and Condom use) (Green, 2003).

In December of that year, the UN Secretary General used World AIDS Day as a platform to speak out against HIV-related stigma and discrimination. He stated that the impact of stigma can be as detrimental as the virus itself and urged people to replace fear with hope, silence with solidarity. He went on to say that the fear of stigma led to silence and silence to death. The use of the phrase silence is death had been used around the world for many years by AIDS activists, originally by the group ACT UP (Annan, 2002).

Year: 2003

In 2003 the first of a new type of antiretroviral drug, Fuzeon (also known as enfuvirtide or T-20) was approved. Fuzeon was designed to prevent the entry of HIV into human cells. The drug had to be injected and was offered mostly as salvage therapy by patients who had already become resistant to other drugs (FDA, 2003).

In April of that year the Centers for Disease Control and Prevention (CDC) announced a new initiative called Advancing HIV Prevention (AHP). This new initiative would target HIV positive individuals in contrast to the CDC's prior efforts which focused its prevention at HIV negative individuals at risk of becoming infected with HIV. AHP proposed making HIV testing a routine part of medical care and putting more resources into partner tracing. The rapid HIV test would play an important role in the new initiative (MMWR, 2003).

Year: 2004

A survey done in 2004 of US media coverage of the AIDS epidemic revealed that the number of AIDS-related stories peaked in 1987 and rapidly declined in the early 1990s, despite these being the peak years for AIDS deaths. The stories increased slightly in 1991, when Magic Johnson spoke publicly about his HIV status. The number of stories revived again in 1996-7 with the introduction of combination therapy (Brodie, Hamel, Brady, Kates, & Altman, 2004).

By May, of 2004 five porn stars had been found to be HIV-positive. The US porn industry was filled with fear of an HIV outbreak among its stars (BBC News, 2004).

In June 2004 President Bush implemented a $15 billion initiative to combat the global AIDS pandemic, known as PEPFAR (President's Emergency Plan for AIDS Relief), having received its first funding in January. PEPFAR concentrated on fifteen countries, all in Africa except Guyana, Haiti and Vietnam. The initiative set a goal of providing AIDS treatment to 200,000 people living in theses countries by June 2005 (U.S. Department of State, 2004).

Year: 2005

A year later, PEPFAR's approach to HIV prevention (described as "ABC") came under increasing criticism and accused of being motivated by ideology, and focusing too much on abstinence while downplaying the role of condoms. The IDSA and the HIVMA two prominent US medical associations, were also critical. However PEPFAR maintained that their approach to HIV prevention was adequate and based on evidence of effectiveness (HIVMA & IDSA, 2005).

In 2005 the FDA approved a generic antiretroviral drug made by a South African company (Aspen Pharmacare). Until then all PEPFAR-funded programs had had to stick to the more expensive FDA approved brand-named products. This came a few weeks after the US company Barr Laboratories announced its first ever FDA-approved generic, This was the beginning of providing cheaper treatment in Africa (Agovino, 2005).

At the 2005 National HIV Conference, the CDC announced a new estimate of HIV prevalence in the U.S. The CDC had calculated that between 1.039 million and 1.185 million Americans were living with HIV at the end of 2003, of which 47% were black. One in four HIV-positive people did not know they were infected. Other studies presented at the conference showed that new infections among African Americans were rising, and the total number of new cases was remaining stable at around 40,000 per year (Kaiser Daily HIV/AIDS Report, 2005).

In September 2005 the antiretroviral drug zidovudine (AZT) reached the end of its patent period with GlaxoSmithKline. The FDA approved four generic forms of AZT for sale within the U.S. that year (Kaiser Daily HIV/AIDS Report, 2005).

Year: 2006

In January 2006, the rock star Bono announced the creation of Product RED a brand designed to help raise money to fight AIDS in Africa. The brand involved Armani, Gap, American Express and Converse, each of which would sell the brand and donate a portion of the profits to the Global Fund. The first merchandise became available in the UK a few months later (BBC, 2006). Product RED was launched in the U.S. in October, by which time Apple and Motorola were also supporting the brand (PRNewswire, 2006).

In August 2006 at the XVI International AIDS Conference in Toronto attention was turned to accelerate access to antiretroviral therapy worldwide. Another important issue discussed was the pros and cons of routine HIV testing. The WHO and other delegates suggested that wider use of this approach would increase treatment and help to counter stigma. The conference also provided a platform for critics of the South African government's lack of response to HIV/AIDS. Activists protested the government's continued support of unproven nutritional remedies, with almost no reference to effective medication, and the failure of South Africa's leaders to talk openly about AIDS. Critics called the South African government obtuse and negligent providing treatment for its people (Kaiser Daily HIV/AIDS Report, 2006)

As a response to the conference, over 80 prominent international scientists wrote an open letter to South African President Thabo Mbeki requesting the resignation of health minister Manto Tshabalala-Msimang, whom they blamed for "disastrous, pseudo-scientific policies" on AIDS (Leonard, 2006). In response, the president set up a new committee to handle the national AIDS response (South Africa Info, 2006).

In 2006 PEPFAR announced that it was providing treatment to 401,000 people in its 15 focus countries (Office of the Global AIDS Coordinator, 2006). The news was soon overshadowed by criticism of PEPFAR's HIV prevention policies. The Government Accountability Office revealed that by allocating one third of its prevention budget to programs promoting abstinence they were cutting funding to help high-risk groups and to prevent mother-to-child transmission (Government Accountability Office, 2006).

That year in June, the Gates Foundation received a substantial boost to its finances when Warren Buffet pledged to donate $31 billion over ten years. Bill Gates resigned as head of Microsoft to concentrate on the work of the Gates Foundation (McNeil & Lyman, 2006).

In 2006 the first once-a-day pill for treating HIV infection was approved. Atripla, a combination of 3 types of antiretroviral drugs was a result of unprecedented cooperation between two pharmaceutical companies. Once-daily treatment represented great progress since the 90s, when people with HIV usually had to take several pills every few hours (Pollack, 2006).

That same year the CDC issued new guidelines recommending routine HIV testing for everyone attending healthcare services. Routine testing had already proved successful in identifying HIV among pregnant women and reducing mother to child transmission; the CDC hoped that more general use of testing would help cut the rate of new infections, and would result in more people accessing medical treatment before becoming sick (CDC MMWR, 2006).

The US National Institutes of Health made the most important scientific announcement that year when they revealed the results of two African trials of male

circumcision as an HIV prevention method. The studies were stopped early for ethical reasons because they had already provided evidence that circumcision reduced HIV transmission by around 50%-60%. The WHO and other organizations suggested began promoting male circumcision in areas with extreme HIV epidemics. The difficulties associated with circumcision included acceptability, demands on resources, and infections resulting from unsafe operations. It was also clear that the benefit would be lost if circumcised men gained a false sense of security, and began to engage in more risky sexual behavior (NIH. 2006).

Year: 2007

Three months later, in 2007 The World Health Organization (WHO) and the Joint UN Program on HIV/AIDS (UNAIDS) issued their recommendations on circumcision and HIV. The publication stressed that circumcision provides only partial protection against HIV and should only be provided as part of a comprehensive HIV prevention package. It also stressed that well-trained practitioners working in sanitary conditions should perform the procedure only after obtaining informed consent (WHO, 2007).

A week later, The Institute of Medicine (IOM) issued a review of PEPFAR. The report praised the multi-billion dollar program for providing treatment, care, testing and prevention services to millions of people in developing countries, but urged President Bush to consider its recommendations to change a number of policies that were judged to have hampered effectiveness (IOM, 2007).

May of 2007 President Bush announced the renewal of the PEPFAR initiative for another 5 years, and doubling the budget to $30 billion. The fund's focus would change from emergency action, to the expansion and sustainability of the programs (The White

House, 2007). Although the news was widely welcomed, there were criticisms regarding the plan's regulation committing 33% of funding to abstinence-only programs (Medical News Today, 2007).

In August 2007 Deputy Health Minister Nozizwe Madlala-Routledge was fired. This brought down optimism regarding South Africa's response to HIV/AIDS. After years decades of denial, inaction, and misinformation it was felt that Madlala-Routledge would bring change by recognizing the seriousness of the epidemic and her determination to take effective action. It was felt that the real motive for her dismissal was her ongoing conflict with Tshabalala-Msimang and in particular their contrasting opinions on how to handle the AIDS crisis in their country (Nullis, 2007).

In August, the FDA granted accelerated approval to the new HIV drugs maraviroc (Selzentry) and raltegravir (Isentress). These two new drugs offered hope to HIV positive patients resistant to almost all other classes of antiretroviral drugs. (HIV and Hepatitis, 2007).

At the end of 2007 UNAIDS released revised global figures of the number of people living with HIV. According to the new statistics, there were 33.2 million people living with HIV globally, down from the 39.5 million estimates made at the end of 2006. Although much of the reduction was attributed to better surveillance techniques in many countries, it also reflected the drop in HIV prevalence in certain areas, including Sub-Saharan Africa. An estimated 2.1 million people died of AIDS in 2007, down from around 2.3 million in 2005. UNAIDS urged for the new statistics not be taken as an excuse to become complacent, or cut funding for AIDS (UNAIDS, 2007).

CHAPTER 3

Understanding HIV/AIDS

HIV Origin

HIV stands for human immunodeficiency virus. This is the virus that causes AIDS. HIV is different from most other viruses because it attacks the immune system. The immune system gives our bodies the ability to fight infections. HIV finds and destroys a type of white blood cell (T cells or CD4 cells) that the immune system must have to fight disease (CDC, 2007, HIV/AIDS Basic Information).

The origin of HIV has long been a hot subject of debate and has sprung various myths rising from the inherent fear of the unknown and the public's mistrust of the government. The most recent research points towards a chimpanzee. Scientists identified a type of chimpanzee in West Africa as the source of HIV infection in humans. The virus most likely jumped to humans when humans hunted these chimpanzees for meat and came into contact with their infected blood. Over several years, the virus slowly spread across Africa and later into other parts of the world (CDC, 2007, HIV/AIDS Basic Information).

Transmission

HIV is spread by sexual contact with an infected person, by sharing needles and/or syringes (primarily for drug injection) with someone who is infected, or, less commonly (and now very rarely in countries where blood is screened for HIV antibodies), through transfusions of infected blood or blood clotting factors. Babies born to HIV-infected women may become infected before or during birth or through breast-feeding after birth. In the health care setting, workers have been infected with HIV after being stuck with needles

containing HIV-infected blood or, less frequently, after infected blood gets into a worker's open cut or a mucous membrane (CDC, 2002, HIV and its transmission).

Prevention

Preventive behaviors to avoid transmission include: sexual abstinence from oral, anal, and vaginal sex, being in a mutually monogamous relationship in which both partners are negative, using condoms consistently and correctly, abstinence from injecting drug use, and use of sterile needles and equipment.

What is AIDS

AIDS stands for acquired immunodeficiency syndrome. AIDS is the final stage of HIV infection. It can take years for a person infected with HIV, even without treatment, to reach this stage. Having AIDS means that the virus has weakened the immune system to the point at which the body has a difficult time fighting infections. When someone has one or more of these infections called opportunistic infections, and a low number of T cells, he or she has AIDS (CDC, 2007, HIV/AIDS Basic Information). Opportunistic Infections include:

Bacterial diseases such as tuberculosis, MAC, bacterial pneumonia and septicemia (blood poisoning)

Protozoal diseases such as PCP, toxoplasmosis, microsporidiosis, cryptosporidiosis, isopsoriasis and leishmaniasis

Fungal diseases such as candidiasis, cryptococcosis and penicilliosis

Viral diseases such as those caused by cytomegalovirus, herpes simplex and herpes zoster virus

HIV-associated malignancies such as wasting, Kaposi's sarcoma, lymphoma and squamous cell carcinoma.

HIV Life Cycle

Understanding how the human immunodeficiency virus (HIV) works inside the human cell gives scientists important clues about how to attack it at its most vulnerable points. Knowing the secrets of how the virus functions and reproduces itself can help scientists design new drugs that are more effective at suppressing HIV and have fewer side effects. For people with HIV, knowing how HIV works can make it easier to understand the way the drugs work in the body (Pieribone, 2003).

Viruses cannot reproduce without the aid of a living cell. Although HIV can infect a number of cells in the body, the main target is an immune cell called a lymphocyte, more specifically a CD4 helper cell, a type of T-cell. T-cells are an important part of the immune system because they help facilitate the body's response to many common but potentially fatal infections. Without enough T-cells, the body's immune system is unable to defend itself against many infections. The HIV life cycle causes a reduction in the number of T-cells in the body, eventually resulting in an increased risk of infections (Pieribone, 2003).

After HIV enters the body -- through unsafe sex, contaminated needles, blood transfusions or from mother to child (vertical or perinatal transmission) -- it comes in contact with the T-cell. When this happens, HIV will hijack the host cell's cellular machinery to reproduce thousands of copies of itself. HIV has to complete many steps in order for this to happen. At each step of HIV's life cycle, it is theoretically possible to design a drug that will stop the virus. Designing drugs to interfere with specific steps in the viral life cycle is called rational drug design (Pieribone, 2003).

The following sections outline some of the better understood steps in the viral life cycle, along with the classes of drugs that inhibit these steps. Scientists are just now

uncovering the ways HIV manipulates the immune system to spread its infection throughout the body (Pieribone, 2003).

Viral Attachment. Once HIV comes into contact with a T-cell, it must attach itself to the cell so that it can fuse with the cell and inject its genetic material into it. Attachment is a specific binding between proteins on the surface of the virus and proteins that serve as receptors on the surface of the T-cell. Normally, these receptors help the cell communicate with other cells. Two receptors in particular, CD4 and a beta-chemokine receptor (either CCR5 or CXCR4), are used by HIV to latch onto the cell. On the surface of the viral envelope, two sets of proteins (also known as antireceptors) called gp120 and gp41 attach to CD4 and CCR5/CXCR4 (Pieribone, 2003).

Viral Penetration/Fusion. After attachment is completed, viral penetration occurs. Penetration allows the nucleocapsid (the genetic core)of the virus to be injected directly into the cell's cytoplasm. gp120 actually contains three sugar-coated proteins (glycoproteins) and, once gp120 attaches itself to CD4, these three proteins spread apart. This allows the gp41 protein, which is normally hidden by the gp120 proteins, to become exposed and bind to the chemokine receptor. Once this has occurred, the viral envelope and the cell membrane are brought into direct contact and essentially melt into each other (Pieribone, 2003).

Uncoating. Once HIV has penetrated the cell membrane, it is ready to release its genetic information (RNA) into the cell. The viral RNA is protected in the nucleocapsid. The nucleocapsid needs to be partially dissolved so that the virus's RNA can be converted into DNA, a necessary step if HIV's genetic material is to be incorporated into the T-cell's genetic core (Pieribone, 2003).

Reverse Transcription. The process by which HIV's RNA is converted to DNA is called reverse transcription. This transcription process happens in almost every human cell,

but in the opposite direction - from DNA to RNA. DNA from the cell nucleus is transcribed into messenger RNA, which then directs the cell's various metabolic functions needed to do its job in the body. HIV uses an enzyme called reverse transcriptase to accomplish this transcription. The single-stranded viral RNA is transcribed into a double strand of DNA, which contains the instructions HIV needs to hijack a T-cell's genetic machinery in order to reproduce itself. Reverse transcriptase uses nucleotides (building blocks of DNA) from the cell cytoplasm to make this process possible (Pieribone, 2003).

Integration. If HIV succeeds in translating its instructions from RNA to DNA, HIV must then insert its DNA (also called the preintegration complex) into the cell's DNA. This process is called integration. In most human cells, there is a structure called the cell nucleus, where the cell's DNA is stored. In order for integration to occur, the newly translated DNA must be transported across the nuclear membrane into the nucleus (Pieribone, 2003).

Although the exact mechanism that HIV uses to transport its genetic cargo into the cell nucleus is still unclear, viral protein R (VPR), which is carried by HIV, may facilitate the movement of the preintegration complex to the nucleus. Once the viral RNA has successfully bridged the nuclear membrane and been escorted to the nucleus, HIV uses an enzyme called integrase to insert HIV's double-stranded DNA into the cell's existing DNA (Pieribone, 2003).

Viral Latency and Protein Synthesis. After successful integration of the viral DNA, the host cell is now latently infected with HIV. This viral DNA is referred to as provirus. The HIV provirus now awaits activation. When the immune cell becomes activated, this latent provirus awakens and instructs the cellular machinery to produce the necessary components of HIV. From the viral DNA, two strands of RNA are constructed and transported out of the nucleus. One strand is translated into subunits of HIV such as protease, reverse transcriptase,

integrase, and structural proteins. The other strand becomes the genetic material for the new viruses. Compounds that inhibit or alter viral RNA have been identified as potential antiviral agents (Pieribone, 2003).

Cleavage and Viral Assembly. Once the various viral subunits have been produced and processed, they must be separated for the final assembly into new virus. This separation, or cleavage, is accomplished by the viral protease enzyme. If cleavage is successfully completed, the HIV subunits combine to make up the content of the new virons. In the next step of the viral life cycle, the structural subunits of HIV mesh with the cell's membrane and begin to deform a section of the membrane. This allows the nucleocapsid to take shape and viral RNA is wound tightly to fit inside the nucleocapsid (Pieribone, 2003).

Budding. The final step of the viral life cycle is called budding. In this process, the genetic material enclosed in the nucleocapsid merges with the deformed cell membrane to form the new viral envelope. With its genetic material tucked away in its nucleocapsid and a new outer coat made from the host cell's membrane, the newly formed HIV pinches off and enters into circulation, ready to start the whole process again (Pieribone, 2003).

During HIV's life cycle, the T-cell, known as the host cell, is altered and perhaps damaged, causing the death of the cell. Scientists are not sure exactly how the cell dies but have come up with a number of scenarios. First, after the cell becomes infected with a virus or other pathogen, internal signals may tell it to commit suicide. This is known as apoptosis or programmed cell death -- a self-destruct program intended to kill the cell with the hopes of killing the virus as well. A second possible mechanism for the death of the cell is that, as thousands of HIV particles bud or escape from the cell, they severely damage the cell's membrane, resulting in the loss of the cell. Another possible cause for the cell's death is that

other cells of the immune system, known as killer cells, recognize that the cell is infected and inject it with chemicals that destroy it (Pieribone, 2003).

Whatever the mechanism of the cell's death, there is one less T-cell in the body, and with this happening on a monumental scale, T-cells begin to decline. Over time, there are not enough T-cells to defend the body. At this stage, a person is said to have acquired immunodeficiency syndrome, or AIDS, and becomes susceptible to infections that a healthy immune system could deal with. If this process of immune destruction is halted, a weakened immune system may be able to repair some of the damage over time (Pieribone, 2003).

There is still much that is not known about HIV's life cycle. More research will enable scientists to coax HIV into giving up more secrets of how it survives and spreads in the body. In turn, this will allow for the development of new drugs and vaccines designed to stop it (Pieribone, 2003).

Testing

The Centers for Disease Control and Prevention (CDC) estimates that 38% to 44% of all adults in the United States have been tested for HIV and that between 16 and 22 million people aged 18-64 years are tested for HIV annually. However, of the more than one million people living with HIV in the U.S., it is estimated that about one-quarter (252,000 to 312,000 persons) are unaware of their HIV status (CDC, 2006, Revised Recommendations for HIV Testing of Adults, Adolescents, and Pregnant Women in Health-Care Settings).Because they do not know they are infected, these individuals are unable to benefit from clinical care related to their HIV disease. In addition, some of these people may unknowingly be transmitting HIV to other people.

In September 2006 the CDC released new recommendations which advise routine HIV screening of adults, adolescents, and pregnant women in health care settings in the

United States. They also recommend reducing barriers to HIV testing. (CDC, 2006, Revised Recommendations for HIV Testing of Adults, Adolescents, and Pregnant Women in Health-Care Settings). The rationale behind these recommendations is that people who are infected with HIV but not aware of it are not able to take advantage of the therapies that can keep them healthy and extend their lives, nor do they have the knowledge to protect their sex or drug-use partners from becoming infected. Knowing whether one is positive or negative for HIV confers great benefits in healthy decision making (CDC, 2007, HIV/AIDS Basic Information).

HIV antibody tests do not measure or detect the virus itself but instead look for the body's reaction to the virus - the presence of antibodies to HIV. There are three commonly used antibody tests that are used for diagnosis: ELISA, Western Blot, and IFA (San Francisco AIDS Foundation, 2007, AIDS 101: Guide to HIV Basics).

ELISA. The ELISA (also sometimes called EIA) is almost always the first screening tool; it is inexpensive and very sensitive for detecting the presence of HIV antibodies. In most cases, a blood sample is tested, but other types of ELISA tests that use saliva and urine have also been developed. The actual ELISA takes 3.5 to 4 hours, but most test sites send samples to outside labs, where they are tested in batches, so it may take one to two weeks for results (San Francisco AIDS Foundation, 2007, AIDS 101: Guide to HIV Basics).

ELISA tests are very rarely false negative. This means testing negative at least six months after the last potential exposure means the person is HIV negative. An ELISA test may rarely be false positive. False positive ELISA results can occur if someone is tested right after events that temporarily stimulate the immune system, such as viral infections or immunizations. They could also occur because of lab error, or because of the test's very high sensitivity. For these reasons, positive ELISA results must always be confirmed with a

Western Blot or IFA and commonly done automatically with the same blood sample (San Francisco AIDS Foundation, 2007, AIDS 101: Guide to HIV Basics).

A relatively new test, called a detuned ELISA, which has been used in research settings, will soon become more widely available to other test sites. The detuned test, which is used only after HIV antibodies are confirmed by a Western Blot test, can determine if the HIV infection is recent (within the last six months), which may be useful for deciding upon possible early treatment options (San Francisco AIDS Foundation, 2007, AIDS 101: Guide to HIV Basics).

Western Blot Assay. The Western Blot is a confirmatory test: it is only performed if the ELISA is positive. The Western Blot can be positive, negative, or indeterminate. Indeterminate tests are neither positive nor negative. An indeterminate result usually means that a person has just begun to seroconvert at the time of their test. In the rare cases in which this occurs, the person will need to be retested, usually about one month later. False positive results are extremely rare with the Western Blot, so it confirms that HIV antibodies are present (San Francisco AIDS Foundation, 2007, AIDS 101: Guide to HIV Basics).

Indirect Immunofluorescence Assay (IFA). The IFA can be used instead of the Western Blot to confirm ELISA results. Like the Western Blot, IFA tests for the presence of antibodies in a blood sample. The exact strategy is slightly different in that is uses a microscope. It can be faster than a Western Blot, so the few labs that use it can get results more quickly (San Francisco AIDS Foundation, 2007, AIDS 101: Guide to HIV Basics).

Orasure Test. The OraSure HIV antibody test method, approved by the FDA in 1996, uses a sample of oral mucus obtained with a specially treated cotton pad that is placed between the cheek and lower gum for two minutes. The sample is sent to a lab, where it undergoes an ELISA procedure. All positive ELISA samples undergo a Western Blot

confirmatory test (using the same pad).The combined accuracy of OraSure ELISA and Western Blot procedures is comparable to traditional blood testing (San Francisco AIDS Foundation, 2007, AIDS 101: Guide to HIV Basics).

OraQuick-Advanced. Also known as the Rapid HIV Test. This HIV-1 antibody test offers results that are 99.6% accurate and the results can be determined within 20-30 minutes. All positive results are preliminary until a confirmatory test (Western Blot) is conducted. The rapid test can be conducted through either a mouth swab or finger-prick (San Francisco AIDS Foundation, 2007, AIDS 101: Guide to HIV Basics).

Window Period

The window period is the time it takes for a person who has been infected with HIV to react to the virus by creating HIV antibodies. This is called seroconversion. During the window period, people infected with HIV have no antibodies in their blood that can be detected by an HIV test, even though the person may already have high levels of HIV in their blood, sexual fluids, or breast milk. Antibodies generally appear within three months after infection with HIV, but may take up to six months in some extremely rare cases. The three month window period is normal for most of the population. Although HIV may not be detected by a test during the window period, HIV can be transmitted during that time. In fact, individuals are often most infectious during this time (San Francisco AIDS Foundation, 2007, AIDS 101: Guide to HIV Basics).

Accuracy of Antibody Tests

The accuracy of a medical test is a combination of two factors: sensitivity and specificity. The ELISA is extremely sensitive (about 99.5%), which means it will detect very small quantities of HIV antibody. This high sensitivity reduces the odds of reporting a false negative when HIV antibodies are present. Assuming the person is being tested beyond the

six month window period and has not engaged in activities that put them at risk for HIV, if the ELISA is negative, there is virtually no chance the person has HIV (San Francisco AIDS Foundation, 2007, AIDS 101: Guide to HIV Basics).

The high sensitivity of the test creates a slightly lower specificity. This means the result could (infrequently) be a false positive. To compensate for this, confirmatory tests are automatically performed after a positive ELISA. The Western Blot and IFA are highly specific for HIV antibodies, so they rule out false positive ELISA results nearly every time (San Francisco AIDS Foundation, 2007, AIDS 101: Guide to HIV Basics).

The CDC states that the combined accuracy of the ELISA plus either the WB or IFA is greater than 99%. The CDC recommends retesting any positive (reactive) ELISA twice; if either retest is positive, then a confirmatory test is performed. Only when the confirmatory test is also positive is the result reported as HIV positive (San Francisco AIDS Foundation, 2007, AIDS 101: Guide to HIV Basics).

Monitoring HIV

Once a person has tested positive there are several different types of laboratory tests that can be used to monitor HIV. The four common tests are viral load, CD4 count, complete blood count and blood chemistry tests. These four tests are blood tests and are the most comprehensive tests available to monitor the health of individuals living with HIV. Depending on the person's health and whether they are on a treatment regimen, most doctors will run these tests every three to six months (Biel-Cunningham, 2004).

Since these tests are used to monitor overall health through comparisons of tests over time, they are done at the beginning of treatment to provide a baseline for future comparisons. Lab tests are an invaluable part of comprehensive HIV health care by helping

to monitor HIV progression. These tests can be a good indicator to help detect problems (Biel-Cunningham, 2004).

Viral Load. This test is responsible for measuring the amount of HIV in the blood (copies/mL). There are two types of viral load tests: polymerase chain reaction (PCR) or branched DNA (b-DNA). Although these two tests come to comparable conclusions, the results of the two different tests do not correlate. Even though the results basically provide the same information, it is important to use just one of these tests over time for more consistent comparisons (Biel-Cunningham, 2004).

The goal with this test is to reach or get as close to undetectable as possible. For the PCR viral load test, less than 50 copies of HIV in the blood is considered undetectable, and for the b-DNA viral load test, less than 400 copies of HIV in the blood is considered undetectable. Viral load tests are recommended every three months. It takes approximately four to seven days for the laboratory to process the test (Biel-Cunningham, 2004).

CD4 Count. This test measures how many CD4 cells (T cells) are in the body, reflecting the health the immune system. The focus of this test is to measure the absolute CD4 count. The absolute CD4 count refers to the number of CD4 cells available in the immune system. CD4 cells are the part of the immune system responsible for fighting infections and are the cells directly targeted by HIV. As HIV progresses, they take over the CD4 cells, using the cells to replicate HIV, killing off the original CD4 cell in the process. This is why a CD4 count is a useful indicator of immune system health. The more CD4 cells, the stronger the immune system (Biel-Cunningham, 2004).

On average, individuals living with HIV are encouraged to monitor their CD4 count to make sure it is above 200. If they go below 200, however, it is highly encouraged to start a treatment regimen or adjust the current drug regimen. A CD4 count, is recommended as soon

as the person tests positive for HIV, then follow up every three to six months. The laboratory takes two weeks to process this test (Biel-Cunningham, 2004).

Complete Blood Count (CBC). This test is a measure of all the components that make up blood. CBCs are important because some drugs can cause low red or white blood cell counts, which can lead to anemia or other blood disorders. This test measures the amount of white blood cells, hemoglobin, hematocrit and platelets in the blood. With this test, a high white blood cell count can suggest that the body is fighting an infection which may be undetectable; a low red blood cell count with the hemoglobin and hematocrit could be the result of anemia from the HIV medications; and a low platelet count could affect blood clotting (Biel-Cunningham, 2004).

This test is different from the viral load test or the CD4 count because it doesn't show a direct progression related to HIV, but it does help with determining the overall health of the individual. With the CBC, it is recommended that the person be tested every three months if they are on a drug regimen. For individuals not on medication this test should be done as part of the annual physical. This test takes one day for the laboratory to process (Biel-Cunningham, 2004).

Chem-Screen. This test is a general screening to measure whether major organs, muscles, and bones are working appropriately by measuring specific chemicals in the blood. This test is essential in the detection of infections or side effects from medications. One of the most important focuses of this test is the monitoring of liver enzymes. The liver is an important organ because it helps process medications, and with these medications demanding more from the liver, there is a potential for liver toxicities that could affect general health. It is important to monitor the albumin, alkaline phosphatase and bilirubin to ensure a well-functioning liver (Biel-Cunningham, 2004).

Another important focus of this test is the monitoring of the lipid levels in the heart. This test helps monitor LDL cholesterol, HDL cholesterol, and triglycerides. It is important to be aware of these lipids, to help monitor the potential for heart disease. The Chem-Screen test should be taken every three months and the results take two to three days to be completed by the laboratory (Biel-Cunningham, 2004).

How Medications Work

There are currently six categories of HIV antiviral drugs available that have FDA (U.S. Food and Drug Administration) approval (FDA, 2008, Drugs Used in the Treatment of HIV Infection). These drugs work at each stage of the HIV life cycle.

Entry Inhibitors - CCR5 co-receptor antagonist. A drug called Selzentry which gained FDA approval in 2007 works at the viral attachment stage to block the interaction between the cellular receptors and the antireceptor on the virus by binding to or altering the receptor sites (FDA, 2008, Drugs Used in the Treatment of HIV Infection). Scientists have found that people who naturally lack these cellular receptors because of a genetic mutation, or those who have them blocked by natural chemokines (chemical messengers), may not get infected as readily with HIV or may progress more slowly to AIDS. Scientists are also examining vaccines that may help the body block these receptors (Pieribone, 2003).

Fusion Inhibitors. Drugs called fusion inhibitors work at the viral penetration stage to prevent the binding of gp41 and the chemokine receptor. T-20 (enfuvirtide, Fuzeon), an experimental fusion inhibitor that is nearing FDA approval, binds to a portion of gp41, preventing it from binding to the chemokine receptor (Pieribone, 2003).

Nucleotiside Reverse Transcriptase Inhibitors/Non-Nucleoside Reverse Trancriptase Inhibitors. Drugs called reverse transcriptase inhibitors block HIV's reverse transcriptase from using these nucleotides. Nucleoside and nucleotide analog reverse

transcriptase inhibitors (NRTIs) -- such as Zerit, Epivir, and Viread -- contain faulty imitations of the nucleotides found in a T-cell's cytoplasm. Instead of incorporating a nucleotide into the growing chain of DNA, the imitation building blocks in NRTIs are inserted, which prevents the double strand of DNA from becoming fully formed. Non-nucleoside reverse transcriptase inhibitors (NNRTIs) -- such as Viramune and Sustiva -- block reverse transcription by attaching to the enzyme in a way that prevents it from functioning (Pieribone, 2003). The downside to this class of drugs is that NNRTIs are highly cross-resistant to one another. The NNRTIs provide a choice for people who are intolerant of protease inhibitor side effects, those who want to save the protease class for future use, or for those whose protease inhibitor therapy failed them (Meyer, 2004).

HIV integrase strand transfer inhibitors. Drugs that work at the integration stage inhibit the HIV preintegration complex from traveling to the nucleus. Isentress which gained FDA approval in 2007 is the only drug in this category (FDA, 2008, Drugs Used in the Treatment of HIV Infection).

Protease Inhibitors. Drugs that work at the cleavage/viral Assembly stage are called protease inhibitors -- such as Kaletra, Crixivan, and Viracept -- bind to the protease enzyme and prevent it from separating, or cleaving, the subunits. If cleavage completed - Researchers are looking at drugs called zinc finger inhibitors, which interfere with the packaging of the viral RNA into the nucleocapsid (Pieribone, 2003).

Side Effect of HIV Medications

Most people taking antiretroviral medications (ARVs) have some side effects. In general, higher amounts of drugs cause more side effects. Some side effects are mild, like a slight headache. Others, like liver damage, can be severe and, in rare cases, fatal. Some

are temporary, but others might continue as long as the medication is taken, or even after it is stopped (AIDS InfoNet, 2006).

Some conditions are called side effects even though the causes are not certain. In some cases, HIV disease itself might be as much of the cause as true drug side effects. Some of the most common side effects include (AIDS InfoNet, 2006):

Fatigue. Most people with HIV feel tired at least part of the time. It's important to find the cause of fatigue and deal with it.

Anemia. Increases the risk of getting sick with HIV infection and can cause fatigue. Routine blood tests can detect anemia so that it can be treated.

Digestive Problems. Many drugs will cause stomach issues. They can cause nausea, vomiting, gas, or diarrhea. Ways to minimize these problems include eating small amounts instead of three big meals. Eating mild foods and soups, not spicy. Drinking ginger ale or ginger tea and the smell of fresh lemon. Exercising regularly and not skipping meals. Marijuana can help reduce nausea.

Gas and bloating. Some drugs may cause gas and bloating. This can be reduced by avoiding foods like beans, some raw vegetables, and vegetable skins.

Diarrhea. Some people will experience diarrhea. It can range from a small hassle to a serious condition and should be monitored.

Lipodystrophy. This can include fat loss in arms, legs and face; fat gain in the stomach or behind the neck; and increases in fats (cholesterol) and sugar (glucose) in the blood. These changes may increase the risk of heart attack or stroke.

Skin Problems: Some medications cause rashes. Most are temporary, but in rare cases they indicate a serious reaction. Other skin problems include dry skin or hair loss. Moisturizers help some skin problems.

Neuropathy. This is a painful condition caused by nerve damage. It normally starts in the feet or hands.

Mitochondrial Toxicity. This is damage to structures inside the cells. It might cause neuropathy or kidney damage, and can cause a buildup of lactic acid in the body.

Bone Problems. This has recently been identified in people with HIV. Bones can lose their mineral content and become brittle. A loss of blood supply can cause hip problems. It is important for individuals on ARV medication to get calcium from food and supplements. Weight-bearing exercise like walking or weight lifting can be helpful.

Sexual Dysfunction. Individual accounts of impotence after starting protease inhibitors abound in the HIV community. (See Chapter 4 for recommendations)

Adherence to HIV Medications

Adherence means taking the prescribed regimen consistently and regularly. Non-adherence is the number one reason why HIV treatments fail. These medications will only work to reduce the viral load and raise the t-cell count if they are taken regularly. Physicians will often take into account whether a patient is mentally ready to start taking HIV medications (Meyer, 2004).

Non-adherence makes it easy for the virus to mutate and develop resistance to the medications. For this reason it is crucial that individuals do not take medications until they are committed to taking them. One way to increase adherence is keeping the medication regimen simple. Thanks in part to combination drugs, simplifying an HIV

regimen is often easily done. Combination drugs combine two or three drugs into one tablet, which reduces pill burden and makes dosing simpler. Reducing the pill burden and using once daily regimens can greatly increase medication adherence. The use of reminders such as a pill box or alarm, as well as help from family and friends can help individuals stick to their regimen (Meyer, 2004).

Resistance to HIV Medications

When HIV medication is not kept at a steady level in the body, HIV can quickly make copies of itself and that leads to resistance. Resistance is when HIV is able to resist the effects of the HIV medication in the body. When that happens, the drugs will not work as well, or stop working at all, in stopping HIV from spreading throughout the body. If HIV becomes resistant to a medication, the virus can sometimes become resistant to other medications in the same drug class. This is called cross-resistance. The NNRTI class drugs are highly cross resistant to one another. Some PIs are also cross resistant to one another. With new drugs in development, individuals who are already resistant to other HIV medication will get another opportunity to continue drug therapy in the battle against HIV (Meyer, 2004).

CHAPTER 4

Sexual Dysfunction and Fertility in HIV

Sexual dysfunction in men with HIV is hardly new, and it is difficult to isolate protease inhibitors as the cause. Depression (and anti-depressants), stress, physical weakness, opportunistic infections, nerve damage (HIV- or drug-related neuropathy), HIV-associated mental impairment and low sex hormone levels have all received previous attention as factors that diminish the sex lives of persons with HIV or AIDS (Gilden, 1999).

Causes

There are three phases of sexual function: libido (sexual desire), arousal (erection in men), and orgasm. It is necessary for all three phases to function for sexual performance. The causes of poor libido or desire include depression and other psychological factors, side effects of medication, and medical diseases. The causes of poor arousal include side effects of medications, diabetes, circulatory problems or improper function of the blood vessels, alcohol and other drugs, and low testosterone levels. The causes of failure to have an orgasm include psychological problems, side effects of medications, and use of alcohol and/or drugs (Schouten, Lichtenstein, 2002).

Treatments

Testosterone. Levels of this very important sex hormone are known to be lower in many HIV-positive men. While normal testosterone levels for men vary anywhere from 300 ng/dL to 1,200 ng/dL, many researchers believe that optimal benefits are seen in men who maintain levels of at least 500 ng/dL (Dunable, D. 2002).

With the wide availability of testosterone supplementation by way of intramuscular injections, patches and gel; there is no reason to ignore this very significant hormone. In addition to affecting difficulties in achieving erections and possible decreases in sexual interest; low testosterone levels are also associated with loss of muscle or inability to gain muscle, lack of energy, lowered appetite, and even depression (Dunable, D. 2002).

Blood tests can determine a person's testosterone level. Optimally, this test should be run at baseline, before signs of HIV disease progression, and should be included as a regular part of lab work. Many doctors do not routinely check for hormone levels, but it is becoming more and more of a standard part of the chemistry work-up among progressive HIV-specializing physicians (Dunable, D. 2002).

Viagra. With the advent of Viagra HIV positive men can do something about medically induced sexual impairments. But Viagra has complications of its own. Since its release there has been considerable uncertainty about Viagra's interaction with protease inhibitors (PI). PIs interfere with the liver enzymes that break drugs down (Gilden, D. 1999).

Pfizer, Viagra's manufacturer, has finally released some study data that document the effects protease inhibitors have on Viagra levels. Saquinavir, elevates the maximum concentration of Viagra 2.4-fold and extended its half-life in the body by about one hour. Ritonavir, increases the maximum Viagra concentration four times and extends its half-life by almost two hours. Twenty-four hours after taking Viagra, those also receiving Ritonavir have Viagra levels almost equal to the normal maximum concentration. This is

a level usually achieved two hours following the Viagra dose. Viagra had no influence on the blood levels of the protease inhibitors in the Pfizer studies (Gilden, D. 1999).

Based on these findings, Pfizer has altered the Viagra dosing recommendations for those on protease inhibitors. Men normally start out on 50 mg Viagra (only once in a given 24 hours) and raise or lower the dose based on the results and side effects. Men on Saquinavir should instead use 25 mg as the initial dose (Gilden, D. 1999).

For Ritonavir, the situation is more serious. In the study, side effects from Viagra (color distortion, dizziness, facial flushing, headaches and low blood pressure) were much more common in the volunteers on concurrent Ritonavir. Pfizer advises that patients receiving Ritonavir should take only one 25 mg dose of Viagra in a 48-hour period (Gilden, D. 1999).

The company is now trying to extrapolate its results for the other protease inhibitors, which fall between Saquinavir and Ritonavir in their inhibition of liver enzyme activity (Gilden, D. 1999).

High levels of Viagra may be a critical issue. The drug relaxes blood vessel walls and lowers blood pressure. The usual levels of Viagra cause blood pressure throughout the body to go down slightly, resulting in an increased heart rate. These side effects are not considered dangerous in themselves but may contribute to heart attacks in those with other risk factors. Viagra greatly magnifies the effect of nitrate-containing substances (blood pressure medications and poppers) on blood pressure (Gilden, D. 1999).

HIV infection itself enhances the rate of heart attacks, as do the increased blood lipids associated with highly active anti-HIV therapy. Risk factors for heart disease tend to act together in synergistic fashion. Caution should be taken when recommending

Viagra to reverse protease inhibitor or HIV-induced sexual dysfunction (Gilden, D. 1999).

Counseling. Psychological counseling is also a possible treatment option, especially if depression, or anxieties of passing on HIV to others through sexual intercourse are at the root of the sexual dysfunction (Dunable, D. 2002). Often times educating HIV positive individuals about risk reduction and safer sex behaviors can relieve anxiety and reduce or completely eliminate sexual dysfunction.

Review medications side effects. Many drugs for high blood pressure, depression, high cholesterol and high triglycerides can cause sexual problems. And these are not all of the potentially offending medications. It is important to check the side effects of each drug the person is taking. The pharmacy should be able to provide a complete insert for drugs prescribed (Dunable, D. 2002).

Substance Abuse Counseling. Alcohol use and recreational drug use are also known to have negative effects on sexual performance. Substance abuse counseling to quit, or at least reduce use could be beneficial (Dunable, D. 2002).

Fertility Issues

A study published in 2001 in Family Planning Perspectives, concluded 28% of HIV-positive heterosexual or bisexual men who received medical care in the U.S. desired children in the future. Yet while men with HIV desire children, fertility and conception issues may complicate the realization of this dream. Indeed, of those desiring children among the total sample of 1,421 subjects aged 20-44 mentioned above, 41% of men did not expect to have any (Chen, 2001).

Little data are available to clarify the specific role of HIV in fertility. Researchers hypothesize that the virus not only plays a direct role in reduced fertility among HIV-positive MSM, but also has an indirect impact (Margolese, 2004).

One effect of HIV/AIDS on the MSM is a change in fertility levels. HIV/AIDS may induce sterility, decrease production of spermatozoa, and sometimes decrease frequency of sexual intercourse, all contributing to declining fertility (Margolese, 2004).

Conception is of particular concern for HIV positive MSM where the female is negative. Safer sex is recommended, which usually prevents pregnancy. However, assisted reproductive technologies may aid in conception while at the same time minimizing the risk of HIV transmission to the female (Al-Khan, 2003).

Several fertility clinics have experience in providing both intrauterine (within the uterus) insemination and in vitro (test tube) fertilization without seroconversion of the uninfected female. To reduce the risk of HIV transmission, sperm must be isolated from the semen and "washed." Sperm washing must be done in a laboratory. Unfortunately, it is not possible to remove all viral particles from washed sperm, contributing to the controversial nature of this procedure. Yet studies involving washed sperm show that seroconversion rates are low and that many couples are willing to take the risk to become parents (Al-Khan, 2003).

For MSM who identify as gay, and are not in a heterosexual relationship it may be difficult to find a female surrogate willing to take these risks. HIV-positive MSM are not limited to conventional childbearing methods. Other avenues to parenthood include adoption. While stigma continues to be a barrier for MSM seeking to become parents by these means, many have been successful. For those seeking unconventional methods of

parenting, such as surrogacy (when a woman carries the child), little information is available specific to HIV-positive MSM. However, it is likely that similar rules would apply regarding implantation of potentially infected tissue into an HIV-negative woman (Margolese, 2004).

Access to Care

In the February 2002 edition of Fertility and Sterility, the Ethics Committee of the American Society for Reproductive Medicine published new guidelines on treating infertility in HIV-positive individuals. According to the committee, physicians practicing reproductive medicine should not deny treatment to anyone with HIV. Ethically as well as legally, providers have the same obligation to treat HIV-positive patients as those suffering from any other chronic disease. The committee further recommends that when a clinic lacks the skills and facilities to manage people with HIV, the individuals should be referred to a clinic with adequate resources. The guidelines also outline acceptable procedures for conception, including artificial insemination with the partner's sperm if the female partner is HIV positive; artificial insemination using sperm-washing techniques and testing of the washed sperm for virus if the male partner is HIV positive; and in vitro fertilization and ICSI (Margolese, 2004).

As more HIV-positive MSM consider parenthood, it is likely that fertility services will slowly become more available to suit their needs. And it is also likely that ongoing advocacy and education will be required to ensure affordable, timely, and stigma-free access for all HIV-positive MSM seeking to become parents.

CHAPTER 5

Current Trends In High Risk Sexual Behavior Among MSM

Evolving High Risk Groups

Men on the Down low. The term is often used to describe the behavior of men who have sex with other men who do not identify as gay or bisexual. These men may refer to themselves as being "on the down low," "on the DL," or "on the low low." These men do not subscribe to gay subculture and are usually unaware or non-disclosing of their HIV status. The term has most often been associated with African American men. Although the term originated in the African American community, the behaviors associated with the term are not new and not specific to black men who have sex with men. Prevalent behavior among Black and Latino men (CDC, 2006, Questions and Answers: Men on the Down Low).

Much of the media attention about men on the down low and HIV/AIDS has focused on the concept of a transmission bridge between bisexual men and heterosexual women. Some women have become infected through sexual contact with bisexual men (CDC, 2006, Questions and Answers: Men on the Down Low).

The phenomenon of men on the down low has gained much attention in recent years; however, there are no data to confirm or refute publicized accounts of HIV risk behavior associated with these men. What is clear is that women, men, and children of minority races and ethnicities are disproportionately affected by HIV and AIDS and that all persons need to protect themselves and others from getting or transmitting HIV (CDC, 2006, Questions and Answers: Men on the Down Low).

Barebacking. The term barebacking generally refers to gay men engaging in unprotected anal intercourse. With the recent increase in barebacking, it is expected that there will be an increase in the rates of HIV and other STDs. In fact, the rates of gonorrhea and syphilis specifically among gay men have already seen an increase (although the overall rate is going down in other population groups). In addition, with the increase in barebacking, it has brought a second wave of HIV infections in the gay community (Sowadsky, 1999).

Barebacking is an extremely controversial and complicated issue, especially since it is dealing with human behavior. Not all gay men engage in barebacking. Many gay men use condoms every time they have anal sex with every partner. But some gay men prefer to have unprotected anal sex and they are willing to take the risks. For some gay men, the benefits of unprotected anal intercourse (intimacy, pleasure, etc.) outweigh the risks (HIV and other STDs). Future HIV and STD prevention efforts targeted toward the gay community must incorporate the issue of barebacking (Sowadsky, R. 1999).

Bugchasers. Although much less common, there are some HIV-negative men who willingly bareback with other men who they know are HIV positive. There are many reasons for this. Some men like to live life on the edge and get pleasure out of taking their chances. It is sometimes done as a way of showing love in sero-discordant couples. Some men do not mind getting infected, as long as they get infected only from their boyfriend. They see HIV as a special way to further bond their relationship with their lover. Positive men often have their own social circles and friendships. Some men allow themselves to get infected in order to get into these social circles. Being positive can give gay men a sense of belonging (Sowadsky, R. 1999).

Some HIV negative men will do it for public assistance. Being positive sometimes brings with it an increase in social services and benefits (housing, food, etc.). A person who is HIV positive sometimes qualifies for more social services than someone who is not infected. Some men simply do not care whether they get infected or not. They think that if they get infected, they will no longer need to use condoms (not knowing about the problems associated with HIV re-infection, and co-infection). Some gay men are fatalistic. They think that getting HIV is inevitable, so they do not try to avoid it. They feel that trying to stay HIV negative is too stressful, and ultimately allow them selves to get infected in order to get it over with. There are even some men who think that AIDS is just part of being gay (Sowadsky, R. 1999).

There are barebacking parties, also known as conversion parties, or Russian roulette parties where HIV positive men known as gift givers have unprotected sex with bug chasers in order to get infected. In Russian roulette parties men have unprotected sex with both positive and negative men. Negative men take their chances that they will be infected when having sex with the positive men there. Depending on the circumstances, the participants may or may not know ahead of time who is positive and who is negative. There are many websites dedicated to barebacking and bugchasers (Sowadsky, R. 1999).

Anonymous sex and the internet. In the past popular venues for anonymous sex included bathhouses, parks, and video stores. During the past decade, the Internet has created new opportunities for MSM to meet sex partners (Denning & Campsmith, 2005). Internet users can anonymously find partners with similar sexual interests without having to leave their residence or having to risk face-to-face rejection if the behaviors they seek are not consistent with safer sex (Crepaz, Lyles, & Wolitski, 2006). The Internet may also

normalize certain risky behaviors by making others aware of these behaviors and creating new connections between those who engage in them. At the same time, however, the Internet is a potentially powerful tool for use with HIV prevention interventions (CDC, 2007, HIV/AIDS among Men Who Have Sex with Men).

Party and Play (PNP). The term is used among internet circles and identifies gay and bisexual men who use drugs and engage in unsafe sex. The use of alcohol and illegal drugs continues to be prevalent among some MSM and is linked to risk factors for HIV infection and other STDs (CDC, 2005, HIV/AIDS Surveillance Report). Substance use can increase the risk for HIV transmission through the tendency toward risky sexual behaviors while under the influence and through sharing needles or other injection equipment (CDC, 2007, HIV/AIDS among Men Who Have Sex with Men). Reports of increased use of the stimulant drug methamphetamine have raised public health concerns because methamphetamine use has been associated both with risky sexual behaviors for HIV infection and other STDs and with the sharing of injection equipment when the drug is injected (CDC, 2004, Trends). Methamphetamine and other party drugs (such as ecstasy, ketamine, and GHP [gamma hydroxybutyrate]) may be used to decrease social inhibitions and enhance sexual experiences (Glynn & Rhodes, 2005). These drugs, along with alcohol and nitrate inhalants "poppers", have been associated with risky sexual practices among MSM (MacKellar, Valleroy, & Secura, 2005).

CHAPTER 6

Conclusion

Depression, childhood sexual abuse, substance use, and partner violence have been shown to increase the practice of risky sexual behaviors. Further research has shown that the combined effects of these problems may be greater than their individual effects (Diaz, R. 1997). Therefore, MSM with more than 1 of these problems may have additional risk factors for HIV infection. The expansion and wider awareness of this type of research, which shows the additive effect of various psychosocial problems, will result in more precise prevention efforts for MSM and other populations (CDC, 2007, HIV/AIDS among Men Who Have Sex with Men).

MSM are members of all communities, all races and ethnicities, and all strata of society. To reduce the rate of HIV infection, prevention efforts must be designed with respect for the many differences among MSM and with recognition of the discrimination against MSM and persons infected with HIV in many parts of the country. Social and economic factors, including racism, homophobia, poverty, and lack of access to health care, are barriers to receiving HIV prevention services, particularly for MSM of minority races or ethnicities (CDC, 2007, HIV/AIDS among Men Who Have Sex with Men).

Latino men are more likely than white men to be given a diagnosis of HIV infection in the late stages of infection, often when they already have AIDS, suggesting that they are not accessing testing or health care services through which HIV infection could be diagnosed at an earlier stage (Johnson, Carey, & Chaudoir, 2006).

The stigma associated with homosexuality may inhibit some men from identifying themselves as gay or bisexual, even though they have sex with other men (Bull &

McFarlane, 2000). An example of this is the men on the down low phenomenon in the in which men who have sex with men and with women do not identify themselves as gay or bisexual. According to one review, 18% to 35% of heterosexual Latino men reported having had anal or oral sex with a man (CDC, 2003, Late vs. early testing). These men may miss prevention and health messages directed to openly gay men. (CDC, 2007, HIV/AIDS among MSM).

Latino MSM are less likely than white MSM to live in gay-identified neighborhoods (CDC, 2000, HIV/AIDS among racial/ethnic minority MSM). Therefore, prevention programs directed to gay-identified neighborhoods may not reach these MSM. For Latino MSM, unique cultural factors may discourage openness about homosexuality: machismo, the high value placed on masculinity; simpatia, the importance of smooth, non-confrontational relationships; and familismo, the importance of a close relationship with one's family (Millet, Malebranche, Mason, & Spikes, 2005).

Research has shown that many MSM who know they are infected with HIV change their behaviors to lower their risk of transmitting the virus. Therefore, encouraging more people to know their HIV serostatus, through increased HIV testing, can help decrease HIV transmission.

It is important to evaluate the effectiveness of HIV prevention interventions for the Latino MSM population. Research shows that HIV prevention efforts can reduce risk behaviors and increase protective behaviors among Latino MSM. HIV prevention interventions can help to increase the use of condoms and reduce the number of acts of unprotected sex, decrease the number of sex partners, and the frequency of injection drug use, as well as reduce co-infection with sexually transmitted diseases.

Challenges to the design and implementation of HIV prevention programs among Latino MSM include reaching MSM who may not identify themselves as homosexual or bisexual, recognizing the importance of representing Latino MSM in HIV prevention planning, addressing language barriers, and improving access to HIV testing and health care. Within Latino MSM communities, the stigma attached to acknowledging homosexual and bisexual activity may inhibit them from identifying themselves as homosexual or bisexual and they may be more likely to identify with their Latino community than with the MSM community. Latino community leaders should promote dialogue about issues of sexual orientation to overcome social barriers to HIV prevention for Latino MSM.

The call to provide appropriate and accessible services to all persons—regardless of color, ethnicity, national origin, language, race, religion, age, disability, gender, sexual orientation and socioeconomic standing—challenges those involved in HIV care to develop effective, culturally competent services and supports for an increasingly diverse population.

With an increase in number of new infections and in number of Latino MSM newly diagnosed with AIDS, it is imperative to break down those barriers to competent HIV care in order to control this epidemic within the Latino MSM community. Finding ways to develop an effective and culturally competent system of HIV care is the first step towards eliminating the disparities. Eliminating disparities in health outcomes is a challenge. No single solution will resolve the problem because there is no single cause. The many barriers separating individuals from quality care include lack of health

information; co-morbidity involving other serious health problems, such as addiction and mental illness.

Health care providers who work with Latino MSM must be sensitive to a wide range of cultural factors that can dramatically impact treatment outcomes—from language barriers, ethnic stereotypes and lack of health insurance to patients' beliefs about health, illness, family, spirituality and the health care system. A speedy, dedicated, and collaborative response among the government, Latino community members, and influential leaders is imperative to decrease HIV/AIDS among Latino MSM.

DEFINITIONS

Acquired Immunodeficiency Virus (AIDS)

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**.**

Antiretroviral Therapy (ART)

Treatment with drugs that inhibit the ability of retroviruses (such as HIV) to multiply in the body. The antiretroviral therapy recommended for HIV infection is referred to as highly active antiretroviral therapy (HAART), which uses a combination of medications to attack HIV at different points in its life cycle.

Chemokine receptor 5 (CCR5)

A protein on the surface of some immune system cells. It is one of two co-receptors that HIV can use along with the CD4 receptor to bind to and enter host cells (the other co-receptor is CXCR4).

CD4 Cell (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, signaling other cells in the immune system to perform their special functions. The number of CD4 cells in a sample of blood is an indicator of the health of the immune system. HIV infects and kills CD4 cells, leading to a weakened immune system.

CD4 Cell Count

A measurement of the number of CD4 cells in a sample of blood. The CD4 count is one of the most useful indicators of the health of the immune system and the progression of HIV/AIDS. A CD4 cell count is used by health care providers to determine when to begin, interrupt, or halt anti-HIV therapy; when to give preventive treatment for opportunistic infections; and to measure response to treatment.

Centers For Disease Control and Prevention (CDC)

An agency of the U.S. Department of Health and Human Services (HHS) that is charged with protecting the health and safety of citizens at home and abroad. The CDC serves as the national focus for developing and applying disease prevention and control, environmental health, and health promotion and education activities designed to improve the health of the people of the United States.

Co-Infection

Infection with more than one virus, bacterium, or other microorganism at a given time. For example, an HIV-infected individual may be co-infected with hepatitis C virus (HCV) or tuberculosis (TB).

Combination Therapy

Two or more drugs used together to achieve optimal results in controlling HIV infection. Combination therapy has proven more effective in decreasing viral load than monotherapy (single-drug therapy), which is no longer recommended for the treatment of HIV. An example of combination therapy is the use of two NRTIs plus a PI or an NNRTI.

Department of Health and Human Services (HHS)

The U.S. government's principal agency for protecting the health of all Americans and for providing essential human services. HHS includes more than 300 programs covering a wide spectrum of activities. Programs are administered by 11 operating divisions, including the Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA), and the National Institutes of Health (NIH). HHS works closely with state and local governments, and many HHS-funded services are provided at the local level by state or county agencies or through private-sector grantees.

Discordant Couple

A pair of sexual partners in which one person is infected with a sexually transmitted infection (such as HIV) and the other is not.

Entry Inhibitors

A class of anti-HIV drugs designed to disrupt the ability of HIV to enter a host cell through the cell's surface. This class includes receptor inhibitors (CD4, CCR5, or CXCR4) and fusion inhibitors.

Enzyme-Linked Immunosorbent Assay (ELISA)

A highly sensitive laboratory test used to determine the presence of antibodies to HIV in the blood or saliva. Positive ELISA test results indicate that a person is HIV infected, but these results should be confirmed with a highly specific laboratory test called a Western blot.

Food and Drug Administration (FDA)

The U.S. Department of Health and Human Services (HHS) agency responsible for ensuring the safety and effectiveness of drugs, biologics, vaccines, and medical

devices. The FDA also works with the blood banking industry to safeguard the nation's blood supply.

Fusion Inhibitors

A class of anti-HIV drugs that inhibits the fusing of HIV's outer envelope with the host cell membrane, preventing infection of the cell.

Health Resources and Services Administration (HRSA)

A U.S. Department of Health and Human Services (HHS) agency that directs national health programs aimed at improving the health of Americans by assuring quality health care to underserved, vulnerable, and special-needs populations. Among other functions, HRSA administers the Ryan White Comprehensive AIDS Resources Emergency (CARE) Act and the AIDS Education and Training Centers (AETCs) to provide treatment and services for those affected by HIV/AIDS.

Hepatitis C Virus (HCV)

The virus that causes hepatitis C, an inflammation of the liver that can lead to liver damage and liver cancer. HCV is primarily spread through contact with the blood of an infected person. There is no vaccine for HCV, and the only current treatment for hepatitis C is a combination of the drugs peginterferon and ribavirin

Highly Active Antiretroviral Therapy (HAART)

The name given to treatment regimens that aggressively suppress HIV replication and progression of HIV disease. The usual HAART regimen combines three or more anti-HIV drugs.

Human Immunodeficiency Virus (HIV)

The virus that causes Acquired Immunodeficiency Syndrome (AIDS). HIV is in the retrovirus family, and two types have been identified: HIV-1 and HIV-2. HIV-1 is responsible for most HIV infections throughout the world, while HIV-2 is found primarily in West Africa.

Immune System

The collection of cells and organs whose role is to protect the body from foreign invaders. Includes the thymus, spleen, lymph nodes, B and T cells, and antigen-presenting cells.

Integrase Inhibitors

A class of anti-HIV drugs that prevents the HIV integrase protein from inserting HIV's genetic information into an infected cell's own DNA.

Injecting Drug Users (IDU)

People who inject drugs and often share needles. Injecting drug use is well known as a way to spread HIV.

Kaposi's Sarcoma (KS)

A type of cancer caused by an overgrowth of blood vessels, which causes pink or purple spots or small bumps on the skin. The condition can also occur inside the body, especially in the intestines, lymph nodes, and lungs. When inside the body, KS can be life threatening. In people infected with HIV, KS is considered an AIDS-defining condition.

Latino

Persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.

Lipodystrophy

A problem with the way the body produces, uses, and distributes fat. Lipodystrophy is associated with certain anti-HIV drugs. HIV-related lipodystrophy includes the body changes known as "buffalo hump" and "protease paunch."

Lipohypertrophy(hyperadiposity)

Abnormal buildup of fat, particularly in the breasts, on the back of the neck and upper shoulders ("buffalo hump"), deep within the abdomen ("protease paunch"), or in fatty growths known as lipomas. Lipohypertrophy may occur with the use of some PIs and NRTIs.

Men who have sex with men (MSM)

Refers to any man who has sex with a man, whether he identifies as gay, bisexual, or heterosexual. MSM represent a wide variety of people, lifestyles, and associated risks for HIV and other infectious diseases.

Mutation

A change or adaptation that can be passed down to future generations. Mutations can occur only when a virus is actively replicating, and not when anti-HIV drugs have suppressed the viral load to undetectable. If HIV replication is not well controlled, an individual's original HIV strain can adapt to infect different cell types or resist different anti-HIV drugs.

National Institutes of Health (NIH)

A multi-institute agency of the U.S. Department of Health and Human Services (HHS). NIH conducts research in its own laboratories and funds research in universities,

medical schools, hospitals, and other research institutions throughout the United States and abroad.

Neuropathy

A disorder that occurs when nerve cells are damaged. Symptoms range from a tingling sensation or numbness in the toes and fingers to paralysis. Neuropathy can occur as a result of HIV infection or as a side effect of certain anti-HIV drug.

Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs)

A class of anti-HIV drugs that bind to and disable HIV-1's reverse transcriptase enzyme, a protein that HIV needs to make more copies of itself. Without functional reverse transcriptase, HIV replication is halted. Current NNRTI medications are only effective against HIV-1 and not against HIV-2.

Nucleoside Analogue Reverse Transcriptase Inhibitor

A class of anti-HIV drug. Nucleoside analogues are faulty versions of the building blocks necessary for HIV reproduction. When HIV's reverse transcriptase enzyme uses a nucleoside analogue instead of a normal nucleoside, reproduction of the virus's genetic material is halted. Also called nucleoside analogues

Nucleotide Analogue Reverse Transcriptase Inhibitor

A class of anti-HIV drug. Nucleotide analogues are faulty versions of the building blocks necessary for HIV reproduction. When HIV's reverse transcriptase enzyme uses a nucleotide analogue instead of a normal nucleotide, reproduction of the virus's genetic material is halted. Although technically different from nucleoside analogues, nucleotide analogues work in the same way.

Opportunistic Infections (OIs)

Illnesses caused by various organisms that occur in people with weakened immune systems, including people with HIV/AIDS. OIs common in people with AIDS include Pneumocystis carinii pneumonia; cryptosporidiosis; histoplasmosis; toxoplasmosis; other parasitic, viral, and fungal infections; and some types of cancers.

Protease Inhibitors (PIs)

A class of anti-HIV drug that prevents replication of HIV by disabling HIV protease. Without HIV protease, the virus cannot make more copies of itself.

Rapid Test

A type of HIV-1 ELISA test that can detect antibodies to HIV in the blood in less than 30 minutes with greater than 99% sensitivity and specificity. A positive rapid test result should be confirmed by an HIV Western blot test.

Resistance

The ability of bacteria and other microorganisms to withstand a drug to which they were once sensitive and were once slowed in growth or killed outright.

Retrovirus

A type of virus that stores its genetic information in a single-stranded RNA molecule, then constructs a double-stranded DNA version of its genes using a special enzyme called reverse transcriptase. The DNA copy is then integrated into the host cell's own genetic material. HIV is an example of a retrovirus.

Ryan White Care Act

The Ryan White Comprehensive AIDS Resources Emergency (CARE) Act is Federal legislation that addresses unmet health needs of people living with HIV/AIDS by

funding primary health care and support services that enhance access to and retention in care. The CARE Act is administered by the Health Resources and Services Administration (HRSA).

Seroconversion

The process by which a newly infected person develops antibodies to HIV. These antibodies are then detectable by an HIV test. Seroconversion may occur anywhere from days to weeks or months following HIV infection.

Sexually Transmitted Disease (STD)

Any infection spread by the transmission of organisms from person to person during sexual contact.

United Nations Programme on HIV/AIDS (UNAIDS)

Is an innovative joint venture of the United Nations family, bringing together the efforts and resources of ten UN system organizations in the AIDS response to help the world prevent new HIV infections, care for people living with HIV, and mitigate the impact of the epidemic.

Undetectable Viral Load (UD VL)

The point at which levels of HIV RNA in the blood are too low to be detected with a viral load test. This does NOT mean that the virus has stopped replicating or has been removed from the body entirely, only that the small amount of virus remaining is below the test's ability to measure it. The viral load below which a test cannot detect the virus depends on the brand of the viral load test.

Viral Load (VL)

The amount of HIV RNA in a blood sample, reported as number of HIV RNA copies per mL of blood plasma. The VL provides information about the number of cells infected with HIV and is an important indicator of HIV progression and how well treatment is working. VL tests are usually done when an individual is diagnosed with HIV infection and at regular intervals after diagnosis.

Wasting Syndrome

The involuntary loss of more than 10 percent of body weight, plus more than 30 days of either diarrhea or weakness and fever. Wasting refers to the loss of muscle mass, although part of the weight loss may also be due to loss of fat. HIV-associated wasting syndrome is considered an AIDS-defining condition.

Western Blot

A laboratory technique used to detect a specific protein. A Western blot test to detect HIV proteins in the blood is used to confirm a positive HIV antibody test (ELISA).

White Blood Cells (leukocytes)

These cells make up the immune system and include lymphocytes, monocytes, neutrophils, eosinophils, macrophages, and mast cells. White blood cells are made by bone marrow and help the body fight infection and other diseases.

Wild-Type Virus

A term to describe virus strains (including strains of HIV) that have not acquired any genetic mutations that create special characteristics, such as resistance to particular drugs.

Window Period

The time period between a person's infection with HIV and the appearance of detectable anti-HIV antibodies. Because antibodies to HIV take some time to form, an HIV antibody test will not be positive immediately after a person is infected. The time delay typically ranges from 14 to 21 days, but varies for different people. Nearly everyone infected with HIV will have detectable antibodies by 3 months after infection.

World Health Organization (WHO)

Is the directing and coordinating authority for health within the United Nations system. It is responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries and monitoring and assessing health trends.

WORKS CITED

ACT UP. 1987. Flyer of the first ACT UP action. March 24, 1987 (accessed 2/5/08); available from http://www.actupny.org/documents/1stFlyer.html

Agovino, T. 2005. FDA approves generic AIDS drug combo. The New York Times, January 25.

AIDS InfoNet. 2006. Fact sheet 550 side effects. New Mexico AIDS Education and Training Center. April 4.

Alcorn, K. 1996. Eradicating HIV? National AIDS manual. AIDS Treatment Update. Issue 44. August.

Al-Khan, A. 2003. Assisted reproductive technology for men and women infected with human immunodeficiency virus type 1. Clinical Infectious Diseases 36(2): 195-200.

Altman, L.K. 1985. The Doctor's world: AIDS data pour in as studies proliferate. The New York Times, April 23.

Altman, L.K. 1991. AIDS-infected doctors and dentists are urged to warn patients or quit. The New York Times, January 18.

Altman, L.K. 1995. AIDS is now the leading killer of Americans from 25 to 44. The New York Times, January 31.

Altman, L.K. 1996. UN reports 3 million new HIV cases worldwide for '96'. The New York Times, November 28.

Altman, L.K. 1998. AIDS meeting ends with little hope of breakthrough. The New York Times, July 5.

Altman, L. K. 1998. Troubling side effects are linked to effective AIDS drugs therapy. The New York Times, July 7.

Andriote, J.M. 1999. Victory deferred; how AIDS changed gay life in America. The University of Chicago press. Chicago and London.

Annan, K. 2002. Message on world AIDS day. New York Times, December 29.

Arno, P.S. and Feiden, K.L. 1992. Against the odds, the story of AIDS drug development, politics & profits. Harper Collins Publishers.

Associated Press. 1993. New H.I.V. strains resist AIDS drug. The New York Times, January 1.

Associated Press. 1996. FDA clears use of new drugs for AIDS, ALS. The Washington Post, June 25.

Baker, R. 1999. Growing numbers of gay men in San Francisco having unsafe sex. www.hivandhepatitis.com, August 8.

Barre-Sinoussi, F., Chermann, J.C., Rey, F., Nugeyre, M.T. Chamaret, S., Gruest, J., Dauguet, C., Axler-Blin, C., Brun-Vezinet, F., Rouzioux, C., Rozenbaum, W., and Montagnier, L. 1983. Isolation of a T-Lymphotropic retrovirus from a patient at risk for Acquired Immune Deficiency Syndrome (AIDS). Science, May 20.

BBC News. 1999. Africa AIDS drug trade dispute ends. September 18.

BBC News. 2004. New HIV case in US porn industry. May 6

BBC News. 2006. Bono bets on red to battle Aids. January 26.

Biel-Cunningham, S. 2004. Understanding CD4 count, viral load, CBC blood count and chem-screen tests. Survival News, from AIDS Survival Project. September/October.

Bird, K.D. 1991. The use of spermicide containing nonoxynol-9 in the prevention of HIV infection. AIDS, 5 (7) 791-795.

Boffey, P.M. 1986. Surgeon general urges frank talk to young on AIDS. The New York Times, October 23.

Boseley, S. 2002. 13.4 million children are AIDS orphans. The Guardian, July 11.

Brodie, M., Hamel, E., Brady, L.A., Kates, J., and Altman, D.E. 2004. AIDS at 21: media coverage of the HIV epidemic 1981- 2001. The Henry J. Kaiser Family Foundation.

Bronfman, N. 1996. Perspectives on HIV/AIDS prevention among immigrants on the U.S.-Mexico border. The spread of HIV among Latinos. Boulder, CO. Westview Press.

Brown, D. 1995. AIDS virus shown by research to be relentless in reproducing. The Washington Post, January 12.

Brown, D. 1996. AIDS toll falls by half in New York health officials say new funds, drugs, may drive trend. The Washington Post, January.

Brown, D. 1997. Estimated number of children born with AIDS transmitted by mothers. The Washington Post, January 7.

Brown, D. 1997. Triple therapy doesn't destroy HIV scientists find AIDS virus hiding in cells after it has left bloodstream. The Washington Post, November 14.

Brown, D. 1997. US deaths from AIDS fall sharply better therapies get part of credit for drop. The Washington Post, February 28.

Bull, S.S., and M. McFarlane. 2000. Soliciting sex on the internet: what are the risks for sexually transmitted diseases and HIV? Sexually Transmitted Diseases. 2000; 27:545–550.

Bureau of Hygiene & Tropical Diseases. 1986. AIDS Newsletter. Volume 2: Issue 1 January 15.

Bureau of Hygiene & Tropical Diseases. 1993. AIDS Newsletter. Volume 8: Issue 6 April.

Centers for Disease Control. 2000. Nonoxynol-9 trial- the implications. August 4

Centers for Disease Control. 2000. HIV/AIDS among racial/ethnic minority men who have sex with men—United States, 1989–1998. MMWR; 49:4–11.

Centers for Disease Control. 2000. Primary HIV infection associated with oral transmission. January 30, 2000 (accessed 1/5/08); available from www.cdc.gov/hiv/pubs/facts/oralsexqa.htm

Centers for Disease Control. 2001. HIV/AIDS surveillance report, 2001. MMWR; 12:2.

Centers for Disease Control. 2002. HIV/AIDS surveillance report, 2002. US Department of Health and Human Services. (Accessed March 14, 2008); available from http://www.cdc.gov/hiv/topics/surveillance/resources/reports

Centers for Disease Control. 2002. HIV and its transmission. (Accessed 3/10/08); available from http://www.cdc.gov/hiv/pubs/facts/transmission.htm.

Centers for Disease Control. 2003. Late versus early testing of HIV—16 sites, United States, 2000–2003. MMWR; 52:582–586.

Centers for Disease Control. 2004. HIV/AIDS surveillance report, 2004. U.S. Department of Health and Human Services. (Accessed March 14, 2008); available from http://www.cdc.gov/hiv/topics/surveillance/resources/reports

Centers for Disease Control. 2004. Trends in primary and secondary syphilis and HIV infections in men who have sex with men—San Francisco and Los Angeles, California, 1998–2002. MMWR; 53:575–578.

Centers for Disease Control. 2005. HIV/AIDS surveillance report, 2005. US Department of Health and Human Services. (Accessed March 14, 2008); available from http://www.cdc.gov/hiv/topics/surveillance/resources/reports

Centers for Disease Control. 2006. Questions and answers: men on the down low. October 19, 2006. (Accessed March 14, 2008); available from http://www.cdc.gov/hiv/topics/aa/resources/qa/downlow.htm

Centers for Disease Control. 2006. Revised Recommendations for HIV Testing of Adults, Adolescents, and Pregnant Women in Health-Care Settings (Accessed 3/10/08); available from http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5514a1.htm

Centers for Disease Control. 2007. HIV/AIDS among men who have sex with men. (Accessed 3/10/08); available from http://www.cdc.gov/hiv/topics/msm/resources/factsheets/msm.htm

Centers for Disease Control. 2007. HIV/AIDS basic information. (Accessed 3/10/08); available from http://www.cdc.gov/hiv/topics/basic/index.htm

Chen, J.L. 2001. Fertility desires and intentions of HIV-positive men and women. Family Planning Perspectives 33(4): 144-152.

Chin, J. 1990. Global estimates of AIDS and HIV infections: 1990, in AIDS 1990, a year in review. Current Science Limited. S277-S283.

Cimons, M., and Nelson, H.1987. Bush is booed as he defends AIDS proposals. Los Angeles Times, June 2.

CNN. 2000. Clinton administration declares AIDS a security threat. April 30.

CNN. 1998. New experimental 'morning-after' HIV treatment. June 30.

Coffin, J., Haase, A., Levy, J.A., Montagnier, L., Oroszlan, S., Teich, N., Temin, H., Toyoshima, K., Varmus, H., Vogt, P., Weiss, R.A.1986. What to call the AIDS virus? Nature 321:10.

Connor, E.D. 1994. Reduction of maternal-infant transmission of Human Immunodeficiency Virus type 1 with zidovudine treatment. The New England Journal of Medicine 331:1173-1180.

Connor, S., and Kingman, S.1988. The search for the virus, the scientific discovery of AIDS and the quest for a cure. Harmondsworth, England: Penguin Books.

Cooper D.A., and Merigan, T.C. 1996. Clinical treatment. AIDS; 10 (suppl A): 133-134.

Crepaz, N., Lyles, C. M., and Wolitski, R. J. 2006. Do prevention interventions reduce HIV risk behaviors among people living with HIV? A meta-analytic review of controlled trials. AIDS; 20:143–157.

Del Romero, J. 2002. Evaluating the risk of HIV transmission through unprotected orogenital sex. AIDS 16:9; 1296-1297.

Denning, P.H., and Campsmith, M. L. 2005. Unprotected anal intercourse among HIV-positive men who have a steady male sex partner with negative or unknown HIV serostatus. American Journal of Public Health; 95:152–158.

Department of Health Services. 2000. Supplemental HIV surveillance study project: Los Angeles County. January.

Dewar, H. 1995. Senate votes to continue AIDS program Helms fails in bid to freeze funding. The Washington Post, July 28.

Diaz, R. 1997. Latino gay men and psycho-cultural barriers to AIDS prevention. In: Levin, M.P., Nardi, P.M., Gagnon, J.H., eds. In changing times: gay men and lesbians encounter HIV/AIDS. Chicago. University of Chicago Press.

Diaz, R.M., Ayala, G., Bein, E., Henne, J., and Marin, B.V. 2001. The impact of homophobia, poverty, and racism on the mental health of gay and bisexual Latino men: findings from 3 U.S. cities. American Journal of Public Health 91:927-932.

Donini- Lenhoff, F. G. and Hedrick, H. L. 2000. Increasing awareness and implementation of cultural competence principles in health education professions education. Journal of Allied Health. 29:241-245.

Dunable, D. 2002. Treatments for male sexual dysfunction. AIDS Survival Project, Survival News. November.

Editorial. 1996. National AIDS strategy not quite complete. San Francisco Chronicle, December 17.

Egan, J. 1994. HIV risk ten times higher for migrant farm workers. Public Health Report 109(3):459.

Ekstrand, M.1999. Gay men report high rates of unprotected anal sex with partners of unknown or discordant HIV status. AIDS 13: 1525-1533.

Essien, E.J., Meshack, A. F., and Ross, M. W. 2002. Misperceptions about HIV transmission among heterosexual African-American and Latino men and women. Journal of National Medical Association 94:304-312.

European Centre for the Epidemiological Monitoring of AIDS. 1993. AIDS surveillance in Europe; quarterly report 37, March 31.

Farley, M. 2002. Female AIDS cases on rise. The Los Angeles Times, November 27.

Fischl, M. A., Richman, D. D., Grieco, M. H., Gottlieb, M. S., Vombarding, P. A., Laskin, O. L., Leedom, J. M., Groopman, J. E., Mildvan, D., and Schooley, R. T. 1987. The efficacy of azidothymidine (AZT) in the treatment of patients with AIDS and AIDS-related complex, a double-blind, placebo-controlled trial. The New England Journal of Medicine 317: 185-191.

Food and Drug Administration. 1988. Making drugs available for life-threatening diseases. October 19, 1988 (accessed 12/5/08); available from http://www.fda.gov/bbs/topics/NEWS/NEW00151.html

Food and Drug Administration. 1991. ddC receives treatment IND Status. June 13.

Food and Drug Administration. 1992. AIDS drug Zacitabine (ddC). Press release, P 92-19, June 22.

Food and Drug Administration. 1996. Biological device application approvals. October 1996 (accessed 12/15/07); available from www.fda.gov/cber/appr1996/1996dev.htm

Food and Drug Administration. 1998. FDA approves a new drug to treat HIV. September 18.

Food and Drug Administration. 2003. Fuzeon (T-20) approved in the U.S. March 13.

Food and Drug Administration. 2008. Drugs used in the treatment of HIV infection. January, 2008 (Accessed March 10, 2008); available from http://www.fda.gov/oashi/aids/virals.html

Francioli, P. 1982. Multiple opportunistic infections in a male homosexual in France. The Lancet 1:572-573.

Francis, D. 1998. AIDS at 20, life during the plague. Newsweek, June.

Freudenheim, M. 1989. Sick get experimental drugs free. The New York Times, October 21.

Galanti, G. 2003. The Hispanic family and male-female relationships: an overview. Journal of Transcultural Nursing 14:3; 180-185.

Gelb, L. 1996. FDA approves first HIV home test system. Food and Drug Administration News Release, May 14.

Getty, J. 2001. The FDA letter to HIV drug makers. The Bay Area Reporter, July 6.

Gilden, D. 1999. Protease inhibitors, sexual dysfunction and Viagra. Gay Men's Health Crisis. GMHC Treatment Issues. March.

Glynn, M., and Rhodes, P. 2005. Estimated HIV prevalence in the United States at the end of 2003. National HIV Prevention Conference, Atlanta. Abstract T1-B1101. June.

Goofman, E. 1963. Stigma: notes on the management of spoiled identity. Englewood Cliffs, New Jersey: Prentice-Hall.

Gorman, C., Thomson-Washington, D. and Cheryl, P. 1989. How much for a reprieve from AIDS? Times Magazine, October 2.

Gott, T., Thames, D., and Hudson, G. 1994. Don't leave me this way, art in the age of AIDS. National Gallery of Australia.

Goulder, P.J.R., and Walker, B.D. 2002. HIV-1 superinfection - a word of caution. The New England Journal of Medicine 347:756-758.

Government Accountability Office. 2006. Global health: spending requirement presents challenges for allocating prevention funding under the president's emergency plan for AIDS relief. GAO 6:395. April 4.

Green, E.C. 2003. Rethinking AIDS prevention. Westport, Connecticut. Greenwood Publishing Group.

Halperin, D.T., and Bailey R.C. 1999. Male circumcision and HIV infection: 10 years and counting. The Lancet 354:1813-15.

Heredia, C. 2001. New AIDS czar called a skilful bridge builder/ Evertz the first gay man to hold position. The San Francisco Chronicle, April 10.

Herek, G.M., Capitanio, J.P., and Widaman, K.F. 2002. HIV-related stigma and knowledge in the United States: Prevalence and trends 1991-1999. American Journal of Public Health 92:3:371-377.

Hilts, P J. 1989. AIDS treatment costs put at billion a year. The New York Times, September 15.

HIV and Hepatitis. 2007. Overview of new FDA approved entry inhibitor Maraviroc (Selzentry). August 14, 2007 (Accessed 2/18/08); available from http://www.hivandhepatitis.com/hiv_and_aids/selzentry_maraviroc.html

HIVMA and IDSA. 2005. Preventing HIV and other sexually transmitted infections: a call for science-based government policies, March.

Hooper, C. 1987. Critics unimpressed with Reagan's AIDS gambit. United Press International. April 6, 1987 (Accessed 3/1/08); available from http://www.cdc.gov/hiv/topics/basic/index.htm#hiv

IOM. 2007. PEPFAR implementation: progress and promise, March 30.

Johnson, B.T., Carey, M.P., and Chaudoir, S.R. 2006. Sexual risk reduction for person living with HIV: research synthesis of randomized controlled trials, 1993 to 2004. Journal of Acquired Immune Deficiency Syndromes; 41:642–650.

Josefson, D. 2001. FDA warning to manufacturers of AIDS drugs. The BMJ 322:1143. Journal of Transcultural Nursing. 14:180-185.

Kaiser Daily HIV/AIDS Report. 2005. FDA approves four generic forms of Zidovudine for U.S. sales after Retrovir's patent expires. The Henry J. Kaiser Family Foundation, September 21.

Kaiser Daily HIV/AIDS Report. 2005. More than 1M HIV-positive people living in United States; nearly half of cases among African Americans. The Henry J. Kaiser Family Foundation, June 14.

Kaiser Daily HIV/AIDS Report. 2006. XVI International AIDS Conference: closing session transcript. The Henry J. Kaiser Family Foundation, August 18.

Kaiser Network. 2004. HIV prevalence among Mexican migrant workers three times as high as general U.S. Mexican populations, studies show. (Accessed on 3/16/08); available from http://www.kaisernetwork.org/daily_reports/rep_hiv.cfm

Kapp, C. 2001. Gloomy anniversary and outlook for HIV/AIDS. The Lancet 357:1860.

Keen, L. 1997. Experts pushing for 'hit early, hit hard': many activists adopt 'wait and see' strategy. The Washington Blade, January 31.

King, E. 1997. Doubt over US stance. National AIDS Manual AIDS treatment Update 56:57.

Kinsella, J. 1989. Covering the plague: AIDS and the American media. New Brunswick, NJ: Rutgers University Press.

Leonard, T. 2006. Scientists Rip South African AIDS Policies. Washington Post, September 6.

Levy, V. 2005. HIV-related risk behavior among Hispanic immigrant men in a population-based household survey in low-income neighborhoods of Northern California. Sexually Transmitted Diseases 32:487-490.

Lowell, B.L. 2002. How many undocumented: the numbers behind the US-Mexico migration talks. The Pew Hispanic Center, March.

MacKellar, D.A., Valleroy, L., and Secura, G. 2005. Unrecognized HIV infection, risk behaviors, and perceptions of risk among young men who have sex with men: opportunities for advancing HIV prevention in the third decade of HIV/AIDS. Journal of Acquired Immune Deficiency Syndromes 38:603–614.

Magis-Rodríguez, C. 1998. La situación del SIDA en México a finales de 1998. Enfermedades Infecciosas y Microbiológicas 18 (6): 236-244.

Mandelbrot, L.1998. Perinatal HIV-1 transmission: interaction between Zidovudine prophylaxis and mode of delivery in the French perinatal cohort. The Journal of the American Medical Association 280:55-60.

Mann, J.M. 1989. AIDS: A worldwide pandemic in current topics in AIDS. Volume 2. edited by Gottlieb M.S, Jeffries D.J., Mildvan D., Pinching A.J., Quinn T.C. and Weiss R.A., John Wiley & Sons.

Mann J.M., and Kay, K. 1991. Confronting the pandemic: the World Health Organization's Global Program on AIDS, 1986-1989', AIDS 1991 a year review. Current Science 221-229.

Margolese, S. 2004. Fertility, conception and HIV. San Francisco AIDS Foundation. Bulletin of Experimental Treatments for AIDS.

Marin, B.V., Gomez, C. 1994. Latinos, HIV disease, and culture: strategies for HIV prevention. In The AIDS Knowledge Base. Cohen, P.T., Sande, M.A., and Volberding, P.A., Little, E.D. Brown & Co. Boston, MA.

Marx, J.L. 1983. Health officials seek ways to halt AIDS. Science, January 21.

Marx, J.L. 1985. A virus by any other name. Science, March 22.

Maugh, II T.H. 1996. Studies of combined HIV drugs promising; health: experts at AIDS conference unveil early results showing treatment involving certain medications reduces virus to undetectable levels. The Los Angeles Times, July 12.

McNeil, D.G., and Lyman, R. 2006. Buffett's billions will aid fight against disease. New York Times, June 27.

McVeigh, T. 2001. Over-65s ignore safe sex warnings. The Guardian, April 9.

Medical News Today. 2007. Lantos hails president's call to double global HIV/AIDS prevention budget, urges review of restrictions on funding, May 31.

Meyer, S. 2004. How HIV drugs work. Positively Aware from Test Positive Aware Network, November/December.

Millet, G., Malebranche, D., Mason, B., and Spikes, P. 2005. Focusing “down low”: bisexual black men, HIV risk and heterosexual transmission. Journal of the National Medical Association 97(7 suppl):52S-59S.

Mitchell, D. 1999. West African chimpanzee source of HIV. Reuters NewMedia, February 1

MMWR Weekly. 1990. Possible transmission of Human Immunodeficiency Virus to a patient during an invasive dental procedure. Centers for Disease Control 39 (29): 489-493.

MMWR Weekly. 1997. Transmission of HIV possibly associated with exposure of mucous membrane to contaminated blood. Centers for Disease Control. 46:620-623.

MMWR Weekly. 2000. HIV/AIDS among racial/ethnic minority men who have sex with men- United States, 1989-1998. Centers for Disease Control 49(01): 4-11.

MMWR Weekly. 2003. Advancing HIV prevention: new strategies for a changing epidemic - United States, 2003. Centers for Disease Control 51:489.

Morales, L.S. 2004. Sociodemographic differences in access to care among Hispanic patients who are HIV infected in the United States. American Journal of Public Health 91:7.

National Institutes of Health. 1999. Researchers identify a simple, affordable drug regimen that is highly effective in preventing HIV infection in infants or mothers with the disease. National Institute of Allergy and Infectious Diseases, July 14.

National Institutes of Health. 2006. Adult male circumcision significantly reduces risk of acquiring HIV - trials Kenya and Uganda stopped early. National Institute of Allergy and Infectious Diseases, December 13.

Nullis, C. 2007. South African AIDS activists outraged over axing of deputy health minister. Herald Tribune, August 9.

Office of Technology Assessment. 1985. Review of the public health service's response to AIDS. U.S. Congress, Washington DC, February.

Office of the Global AIDS Coordinator. 2006. Action today, a foundation for tomorrow: second annual report to congress on the president's emergency plan for AIDS relief. February.

Oleske, J. 1983. Immune deficiency syndrome in children. Journal of American Medicine Association 17: 2345-2349.

Organista, K. C. 1997. Migrant laborers and AIDS in the United States: a review of the literature. AIDS Education Prevention 9:83-93.

Palca, J. 1987. Settlement on AIDS finally reached between US and Pasteur. Nature 326: 533.

Patton, C. 1985. Sex and germs, the politics of AIDS. Boston, MA: South End Press.

Pear, R. 1985. AIDS blood test to be available in 2 to 6 weeks. The New York Times, March 3.

Perlman, D. 1998. AIDS discovery worries scientists; San Francisco man infected with drug-resistant strain of HIV. The San Francisco Chronicle, July 1.

Pieribone, D. 2003. The HIV life cycle. ACRIA Update from AIDS Community Research Initiative of America, Winter Edition.

Pollack, A. 2006. New medicine for AIDS is one pill, once a day. New York Times, July 9.

Priority Press. 1995. Update on combination antiretroviral therapy: results of the Delta study. The Fifth European Conference on clinical aspects and treatment of HIV infection. Copenhagen, Denmark. September 26-29.

PRNewswire. 2006. Bono and Bobby Shriver Launch (RED) trademark in the U.S. October 13.

Public Health Service. 1987. Approval of AZT. News release, March 20, 1987 (accessed 2/5/08); available from http://fda.gov/bbs/topics/NEWS/NEW00217.html

Rangel, G., and Lozada, R. 2002. Factores de riesgo de infección por VIH en migrantes mexicanos: el caso de los migrantes que llegan a la casa del Migrante Centro Escalabrinii y ejército de Salvaci. EL Colegio de la Frontera Norte ISESALUD/COMUSIDA.

Reuters NewsMedia. 1995. Treating STDs and reducing AIDS high risk doctors in study find higher HIV exposure in untreated villagers. The Washington Post, August 25.

Reuters NewsMedia. 1997. Clinton Commits U.S. to Develop AIDS Vaccine. The Washington Post, May 18.

Rosenberg, M. L., Tolsma, D.D., Kolbe, L.J., Kroger, F., Cynamon, M.L. and Bowen. G.S. 1992. The role of behavioral sciences and health education in HIV prevention: experience at the U.S Center for Disease Control in AIDS, prevention through education: a world view. Oxford University Press.

Rosenthal, E. 1991. Angry doctors condemn plans to test them for AIDS. The New York Times, August 20.

Rozenbaum, W. 1982. Kaposi's sarcoma and toxoplasma gondi brain abscess in a Spanish homosexual. The Lancet 1:572.

Ryan White Comprehensive AIDS Resource Emergency (CARE) Act. 2003.

San Francisco AIDS Foundation. 2007. AIDS 101: guide to HIV basics. Testing. September 14.

Schouten, J. T., and Lichtenstein, B. 2002. HIV and sexual functioning: what's (not) up? STEP Perspective. Seattle Treatment Education Project.

Schwartz, J.1995. FDA approves first in new family of AIDS drugs, Saquinavir is most hopeful news in years for victims. The Washington Post, December 8.

Seaton, R. 2003. HIV/AIDS stigma. HRSA CAREACTION, August.

Serwadda, D., Mugerwa, R.D., and Sewankambo, N.K. 1985. Slim disease: a new disease in Uganda and its association with HTLV-III infection. The Lancet 2:849-52.

Slevin, P., and Connolly, C. 2002. Powell urges condom use. The Washington Post, February 15.

Smedley, B.D., Stith, A. Y., and Nelson, A. R. 2002. Unequal treatment: confronting racial and ethnic disparities in health care. Washington, DC: National Academy of Sciences.

SouthAfrica Info. 2006. Mlambo-Ngcuka takes lead on Aids. September 19.

Sowadsky, R. 1999. Barebacking in the gay community. May 1999. (Accessed March 14, 2008); available from http://www.thebody.com/content/whatis/art2276.html

Special to Los Angeles Times. 1990. A regrettable resignation. Los Angeles Times, March 20.

Special to Newsweek. 1987. The AIDS debate: call it a draw. Newsweek, April 13.

Special to The New York Times. 1983. San Francisco seeks to combat fear of AIDS. New York Times, May 22.

Special to Time Magazine. 1990. American notes voices, the 'miracle' of Ryan White. Time Magazine, April 23.

Stevenson, R.W. 1991. Magic Johnson ends his career, saying he has AIDS infection. The New York Times, November 8.

Stine, G.J. 1996. Acquired Immune Deficiency Syndrome: biological, medical, social and legal issues. Prentice Hall. 2nd Edition.

Swindells, S, Cobos, D.G., Lee N., Lien E.A., Fitzgerald A.P., Pauls, J.S. 2002. Racial/ethnic differences in CD4 T cell count and viral load at presentation for medical care and in follow-up after HIV-1 infection. AIDS. 16:1832-1834.

The Guardian. 1991. Fans mourn Freddie Mercury. The Guardian, November 26.

The Henry J. Kaiser Family Foundation. 2003. HIV/AIDS policy fact sheet: Latinos and HIV. July.

The National Academy of Science. 2000. National prevention strategy calls for improved tracking and cost-effective interventions to cut rate of new HIV infections. Press Release, September 27.

The White House. 2007. Fact sheet: President Bush announces five-year, $ 30 billion HIV/AIDS plan. May 30.

Turner, E. 2000. Delayed medical care after diagnosis of persons infected with HIV. Archives of Internal Medicine 160:2614-2622.

UNAIDS. 2007. Global HIV prevalence has leveled off; AIDS is among the leading causes of death globally and remains the primary cause of death in Africa. Press Release, November 20.

U.S. Census Bureau. 2000. Summary file 3 SF3 –sample data. (Accessed 12/18/08); available from www.census.gov

U.S. Census Bureau. 2000. Census 2000 summary File 4: we the people. Hispanics in the United States.

U.S. Census Bureau. 2000. Health insurance coverage. September 2001.

U.S. Census Bureau. 2002. The Hispanic population in the U.S. June 2003.

U.S. Census Bureau. 2003. Current population survey. Annual Social and Economic Supplement.

U.S. Department of Health & Human Services. 1988. Understanding AIDS, a message from the surgeon general. HHS Publication No. (CDC) HHS-88-88404.

U.S. Department of State. 2004. Bringing hope and saving lives: building sustainable HIV/AIDS treatment. Office of the U.S. Global AIDS Coordinator, August.

Valleroy, L. 2001. High HIV and risk behavior prevalence among 23 to 29 year old men who have sex with men in 6 US cities. Poster Presentation.

Van Praag, E., Fernyak, S. and Katz, A. M. 1997. The implications of antiretroviral treatments. Informal Consultation World Health Organization. April.

Vass, A. 2002. Hopes rise for patients with drug resistant HIV. The BMJ 325:62.

Wachter, R. M. 1991. The fragile coalition. NY, New York: St. Martin's Press.

Waldholz, M. 2003. Halting AIDS-drug treatment briefly may help strengthen immune system. The Wall Street Journal. February 1.

Wilkerson, I. 1988. A.M.A. urges breach of privacy to warn potential AIDS victims. The New York Times, July 1.

Wirthlin Worldwide Project. 2001. We speak together, hablamos juntos. The Robert Wood Johnson Foundation.

World Health Organization. 1983. Acquired Immune Deficiency Syndrome emergencies. Report of a WHO Meeting. Geneva, Switzerland. November 22-25.

World Health Organization. 1987. Global statistics in weekly epidemiological record. WHO 49:372

World Health Organization. 1988. AIDS Prevention and control, invited presentations and papers from the World Summit of ministers of health on programs for AIDS prevention. London, England. January 26-28.

World Health Organization. 1994. The current global situation of the HIV/AIDS pandemic. Press release, July 1.

World Health Organization. 1994. Global Program on AIDS; the HIV/AIDS pandemic 1994 overview. Press Release, July 1.

World Health Organization. 1995. Global Program on AIDS: The current global situation of the HIV/AIDS pandemic. Press Release, January 1.

World Health Organization. 1995. Opening address given by Dr. Hiroshi Nakajima, Director-General, World Health Organization to the Sixth International Conferences on AIDS and STDs in Africa. Press Release, December 12.

World Health Organization. 1995. Women and AIDS; women face avoidable risk of AIDS. Press Release, August 23.

World Health Organization. 2007. WHO and UNAIDS announce recommendations from expert consultation on male circumcision for HIV prevention. Press Release, March 28.