OUTPATIENT MANAGEMENT of HIV INFECTION

Third Edition

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Dedication

To my wife, Elizabeth, and my son, Jonathan, for their enduring patience and constant encouragement and to my father for his lifelong inspiration.
Preface

The HIV/AIDS epidemic continues to advance on both old and new fronts. More than previously, however, two distinct epidemics can now be discerned. Because of great improvements in therapy, promising trends have emerged in the United States and other developed countries. New cases and death rates have fallen steadily since the mid-1990s. Where systems of care permit, countless patients have seen a reversal of HIV-related symptoms and significant reconstitution of their immune systems because of effective antiretroviral therapy. New childhood HIV infections have been reduced almost to the vanishing point in the United States, and the image of AIDS as a uniformly lethal disease has been largely transformed in the public mind to that of a chronic, but treatable, disorder. Unfortunately, this transformation has been so profound that, in some circles, it has fueled an increase in high-risk sexual activity.

In stark contrast is the situation in the developing world where an ever-increasing proportion of the world’s AIDS occurs. As the number of infected individuals in Africa has exceeded even the most nightmarish predictions of a few years ago, the countries of South Asia, Central Asia, and Eastern Europe have witnessed an acceleration of their regional epidemics.

Why has the epidemic followed these two divergent paths? In developed countries possessing the resources to fund comprehensive systems of care, development and distribution of, and reimbursement for effective drugs to combat the disease, HIV/AIDS has, at least partially, retreated. But the enormous dedication of funds and the availability of a versatile and effective healthcare apparatus required to accomplish this are far out of reach for most of the countries of the world, including those most devastated by AIDS. Education regarding risk avoidance and, specifically, “safe sex” practices has met with much success in the developed world but, often, with cultural taboos and simple lack of resources to support behavioral change in the developing world.

In all this there is good news and there is very bad news. The good news is that with a concentrated effort, societies can effectively combat this terrible modern plague. The bad news is that such an effort is beyond the capacity of many individual governments and cooperative measures are in their infancy. As long as this situation prevails, the devastation will continue on a scale that was unimaginable 20 years ago when an unusual syndrome of immune deficiency was first described in a small number of homosexual men in New York and California and first dubbed the acquired immune deficiency syndrome.

The challenge of AIDS is complex and multifaceted. Knowledge is accumulating at a remarkable rate. An informed, compassionate practitioner remains the most important ally for the HIV-infected individual attempting to navigate the complex medical and social issues inherent in this disease. It is hoped that this book will be of assistance to those who have accepted this challenge and responsibility.
Author Biography

Dr. Joseph Masci graduated from New York University School of Medicine in 1976. After completing his training in internal medicine at Boston City Hospital and infectious diseases at Mount Sinai Medical Center in New York City, Dr. Masci started the AIDS clinic and program at Elmhurst Hospital Center, a municipal hospital in Queens, New York, in 1985 and has supervised its functions and expansion since that time. He is currently chief of infectious diseases and associate director of the department of medicine at Elmhurst, medical director for AIDS services of the Queens Health Network, and associate professor of medicine at Mount Sinai School of Medicine.

Dr. Masci is the author of two previous editions of this book (Mosby-Year Book, 1992, 1996) as well as numerous textbook chapters and scholarly papers on AIDS and other infectious diseases, and he lectures frequently to academic and lay audiences. His research has been in the areas of therapy and complications of HIV infection as well as behavioral aspects of HIV transmission. He sits on a variety of New York City and New York state committees and panels overseeing clinical care, quality assurance, and medication availability for AIDS programs throughout New York state. He currently lives in Manhasset, New York with his wife and son.
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I. HISTORICAL PERSPECTIVE

In the 20 years since it was first recognized, the HIV/AIDS epidemic has transformed medicine and has itself undergone several transformations. Initially identified as a rare syndrome affecting homosexual men in the United States in the early 1980s, the acquired immunodeficiency syndrome (AIDS) was soon recognized to affect injection drug users, hemophiliacs who had received clotting factors and other recipients of blood products, heterosexual partners of infected individuals, and children of infected mothers. The apparent geographical scope of the epidemic steadily enlarged and soon included every continent, but was especially concentrated in sub-Saharan Africa. The causative agent was identified as a lymphotrophic retrovirus termed first the human T cell leukemia/lymphoma virus, type III (HTLV-3) and subsequently the human immunodeficiency virus, type I (HIV-1, HIV).

A means of rapidly screening blood for antibody to the virus was developed and, beginning in 1985, donated blood in the United States was routinely screened. This diagnostic test permitted a more complete picture of the epidemic to be drawn. Seroprevalence studies of large segments of the general population such as blood donors, military recruits, and applicants for marriage licenses indicated that less than 1% of the population was infected. However, individuals in the highest risk categories for HIV infection were found to have astonishingly high rates of infection, suggesting that HIV had been present as a human pathogen for at least several years before the recognition of the first AIDS cases. It rapidly became clear that most HIV-infected individuals had no symptoms of disease and that the number of symptomatic patients with worsening immune deficiency would be expected to increase steadily. This large group of asymptomatic people also represented a reservoir of infection that would further fuel the epidemic.

An intense, international search for effective antiretroviral agents led to the release of zidovudine (AZT) in 1986 after clinical trials suggested improved survival among some patients with HIV infection. Simultaneously, strategies were developed to treat and prevent several of the major opportunistic infections which represented the great killers of infected individuals with critical immune deficiency. Measurements of cellular immune function, rarely evaluated in adults prior to the advent of HIV, became a key factor in managing HIV infection, and techniques to quantitate T cell subsets...
rapidly became available as routine procedures in commercial and hospital laboratories. Additional therapeutic agents, also drugs of the nucleoside class, were developed and released in the late 1980s and early 1990s, but the actual efficacy of these agents either in monotherapy or multidrug regimens was questioned by many and side effects to therapy were common as refinements of dosing came only after widespread availability of several agents. A major breakthrough came with the demonstration that the risk of vertical transmission could be substantially reduced through the administration of zidovudine during pregnancy and delivery and during the postpartum period to the infant. By the mid-1990s systems of care to test for HIV infection and to provide antiretroviral therapy and preventive therapy for opportunistic infections were well established in many areas of the country, especially the urban centers of the east and west coasts which had been most hard hit by AIDS. Abruptly, in the mid-1990s a major therapeutic advance took place with the release of two new classes of antiretroviral drugs. First, the protease inhibitors and, soon after, the non-nucleoside reverse transcriptase inhibitors were shown to have activity against the virus and to suppress viral replication. Clinical trials established that circulating virus could be reduced, often to unmeasurable levels, by these agents but that resistant strains of the virus emerged quickly if only one drug or class of drugs was used at a time.

Multidrug combinations consisting of 3, 4, or even more agents were studied and found to suppress viral replication more durably and often to permit partial or complete restoration of immune function. Longitudinal studies had established that the amount of circulating virus correlated closely with overall prognosis, and blood tests of so-called "viral load" rapidly became available to enable more precise monitoring of response to therapy. Survival improved significantly and progression to AIDS became less common among HIV-infected patients who were treated with such combined treatment regimens, which were termed highly active antiretroviral therapy (HAART).

With the dramatic success of this new form of therapy came unexpected problems, however. Viral resistance emerged more rapidly than anticipated and a large proportion of patients showed no or only temporary responses to HAART. Peculiar side effects, such as a unique syndrome of fat redistribution and hypertriglyceridemia, were seen with several agents especially the protease inhibitors, and lactic acidosis with hepatic steatosis emerged as a complication of nucleoside therapy. The large pill burden and minor, but vexing, side effects such as diarrhea, drug rashes, nightmares, and other disorders made HAART difficult or impossible for some. Adherence to these treatment regimens often became inadequate, even among motivated patients, leading to more rapid emergence of viral resistance was seen. Underserved communities of individuals in the United States at high risk of HIV infection continue to have inadequate access to care and assistance in maintaining themselves on appropriate treatment. Globally, the HIV epidemic has proceeded essentially unchecked with the majority of cases in the impoverished countries of sub-Saharan Africa where neither prevention nor treatment has had a significant impact (see Figure 1.1).

As the third decade and the next century of the HIV/AIDS epidemic begin, many questions and challenges remain. Among these are:
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What lessons have been learned to help the developing countries most affected by AIDS combat the epidemic?
How will the massive number of “AIDS orphans” in developing countries be cared for?
When should antiretroviral therapy be instituted to provide the greatest long-term benefit and to minimize the risk of resistance?
How can immune reconstitution be accomplished and maintained?
What is the potential for an effective vaccine?
What new pharmaceuticals hold the most promise to further reduce the impact of HIV infection and how should they be developed most efficiently and, if effective, gotten to those in need in time?
How will those traditionally out of reach of the healthcare system be afforded the benefits of advances in therapy?
How will the medical community in the United States respond to the challenge of further changes in therapeutic strategies and goals? How will the constantly changing body of knowledge about HIV infection and its management be communicated rapidly to the practitioners who must apply science to the clinical setting?

II. TRENDS IN THE EPIDEMIC

A. OVERVIEW

Approximately 34 million individuals were living with HIV infection or AIDS at the end of 1999. The distribution by region was as follows: 6

- Sub-Saharan Africa: 24,500,000
- South and Southeast Asia: 5,600,000
- Latin America: 1,300,000
- North America: 900,000
- East Asia and Pacific Islands: 530,000
- Western Europe: 520,000

FIGURE 1.1 Global estimated HIV/AIDS cases by region through 1999. (Adapted from Gayle, H., AIDS, 14 (suppl 2), S8, 2000.)

What lessons have been learned to help the developing countries most affected by AIDS combat the epidemic?
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How will the medical community in the United States respond to the challenge of further changes in therapeutic strategies and goals? How will the constantly changing body of knowledge about HIV infection and its management be communicated rapidly to the practitioners who must apply science to the clinical setting?
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Eastern Europe and Central Asia: 420,000
Caribbean: 360,000
North Africa and Middle East: 220,000
Australia and New Zealand: 15,000

The epidemic has differed somewhat from region to region not only in the number of individuals affected and, therefore, the strain on the healthcare system, but also on the segment of the population hardest hit. Some features, however, are common worldwide: HIV/AIDS has affected the young, otherwise healthy individuals first; efforts to limit spread have met with only partial success; and providing access to effective therapy has been difficult in developed countries and nearly impossible in the developing world. For this reason, it is almost certain that the worst days of the HIV/AIDS epidemic lay ahead, especially in the developing countries of Africa, Asia, and South America.

B. United States

It is estimated that between 650,000 and 900,000 persons in the United States are infected with HIV. Through the end of 1999, a total of 733,374 AIDS cases had been reported from the United States since the beginning of the HIV/AIDS epidemic, including 99% adults and adolescents and 1% children under the age of 13. Through the first 9 months of 2000, an additional 30,346 cases had been reported. The gender distribution of the cumulative total cases has been unequal with more than 4 times as many men as women reported so far (see Figure 1.2). The distribution of reported cases by race and ethnicity has been as follows: 43% of cases have been in whites, 37% in blacks, and 18% in Hispanics, with fewer than 1% each among Asians and Pacific Islanders, Native Americans, and Alaskan Natives (see Figure 1.3). The proportionate number of cases among blacks and among women of all races has increased steadily, with blacks exceeding whites in both reported AIDS cases and deaths since 1996. The proportion of women has also risen steadily in recent years.

![Figure 1.2](image-url)  
**Figure 1.2** Gender distribution of U.S. adult AIDS cases through mid-2000. (Adapted from CDC, *HIV/AIDS Surveillance Report*, 12, 2000.)
reaching 23% of reported cases in 1999, the majority now being infected through the heterosexual route rather than by injection drug use. On the positive side have been two major advances in therapy: the widespread use of potent antiretroviral therapy beginning in 1996 and the use of zidovudine to reduce perinatal transmission and pediatric AIDS since the early 1990s. Approximately 10,000 deaths were reported in 1999, down from over 49,000 in 1995, the year before protease inhibitors became available for antiretroviral therapy. Only 93 pediatric AIDS cases were reported in 1999, down from a high of 947 in 1992.

1. HIV Seroprevalence

Reported AIDS cases represent only a fraction of the number of individuals infected with HIV. With improved care and delayed progression to AIDS and with prolonged survival of patients with AIDS, the natural history of HIV infection has changed dramatically since the mid-1990s. Progression to AIDS previously signaled the terminal phase of disease consisting of steady and irreversible decline in immune function and increasingly symptomatic illness, disability and, within months to a few years, death. Potent antiretroviral therapy has slowed this progression for many individuals and significantly reversed the deterioration of immune function in a substantial proportion so that many individuals previously meeting the AIDS case definition on the basis of severity of immune dysfunction no longer do. Despite such ambiguities, HIV seroprevalence data can give a more complete picture of the status of the AIDS epidemic and can give valuable insights into likely future trends.

As of the end of 1999, in 31 states and the U.S. Virgin Islands, persons (adults and children) testing positive for HIV infection were reported by name to public health authorities. Data from these areas have been used to formulate a picture of the HIV epidemic that goes beyond data extracted from reports of persons with AIDS, which

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all states and areas tabulate. The picture obtained this way is incomplete, particularly since several states and areas (New York, California, District of Columbia) from which a large proportion of AIDS cases had been reported did not (until recently in the case of New York) have reporting mechanisms for HIV-infected persons without AIDS.

2. General Population: United States

Through 1999, of the 733,374 AIDS cases reported in the United States since the beginning of the epidemic, 82% were men, 18% women, and 1% children. It was estimated that 850,000 adults and children in the United States were living with HIV infection. More than 28% of these individuals are thought to have minor children, half of whom live with an infected parent. Twenty thousand deaths were attributed to AIDS in 1999 and 70,000 children had lost either their mother or both parents to the disease since the beginning of the epidemic.

3. Gender

The HIV/AIDS epidemic was initially recognized as a disease primarily and disproportionately affecting men. As the global epidemiology of HIV infection has been elucidated, however, it has become clear that women are equally, if not more often, affected. Twenty-three per cent of newly reported AIDS cases and nearly 40% of newly reported HIV infections occurred in women, continuing a trend of a steadily rising proportion of women among reported cases since the early days of the epidemic.

4. Race/Ethnicity

The African-American and Hispanic communities have borne a disproportionate burden of the AIDS epidemic. Overall, 43% of AIDS cases have been reported in whites, 37% in blacks, and 18% in Hispanics, with less than 1% among Asians and Pacific Islanders. However, in 1999, 42% of newly reported AIDS cases occurred among blacks, 20% in Hispanics, and 36% in whites (see Figure 1.4).

5. Age

HIV infection has traditionally been a disorder primarily affecting adults during their reproductive years. Recent data indicate an aging of the HIV/AIDS population, in part because of longer survival among patients receiving combination antiretroviral therapy. Nevertheless, more than 86% of newly diagnosed and reported HIV infections occurred in individuals between the ages of 20 and 50 (see Figure 1.5).

6. Geographical Distribution

In the United States, the HIV/AIDS epidemic has had its greatest impact in large urban centers, although spread into suburban and rural areas has increased steadily. All regions of the country have been affected (see Figure 1.6). New York, New Jersey, California, Texas, Florida, and the District of Columbia have been hardest hit. The epidemic has shown a pattern of spread from urban centers into adjacent suburbs as well as rural communities. The highest rates of AIDS per 100,000 population in 1999 were in New York (75.5), Florida (65.7), Georgia (40.9), South Carolina (46.6), Arizona (41.5), Louisiana (38.7), and California (36.3). The lowest rates were seen in North Dakota (1.9), Montana (3.0), and Idaho (3.8).10

7. Risk Behavior

Since the beginning of the epidemic, men who acquired infection through homosexual contact have accounted for the majority of reported AIDS cases (56%).10 However, the proportion represented by this group has declined in recent years and reached 44% in 1999. In contrast, the proportion infected through heterosexual contact, accounting for 10% of all cases since reporting began, rose to 15% overall and 40% of female cases in 1999 (see Figures 1.7, 1.8, 1.9).
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C. REGIONAL HIV/AIDS EPIDEMICS

1. Developing Countries

The impact of the HIV/AIDS epidemic in the developing world has been staggering. Because of the tremendous number of infected individuals in many countries and the lack of access to care for HIV infection, the repercussions of AIDS will be...
felt for generations even if transmission were stopped immediately and a cure were discovered.

By the end of 1999, there were sixteen countries where the seroprevalence of HIV infection in the general population was estimated to be 10% or greater and seven countries where it was greater than 20%, all in sub-Saharan Africa. The hardest-hit country in the world was Botswana where prevalence was estimated to be over 35% and where it is anticipated that over two-thirds of 15-year-olds will eventually die of AIDS.
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a. Africa
The earliest documented case of HIV infection was identified retrospectively in a blood sample taken in 1959 from a man in Kinshasa, Democratic Republic of Congo. Soon after AIDS was first seen in the United States in the early 1980s, it was recognized that an HIV/AIDS epidemic had been present, undetected, in Africa for years to decades. The impact of the epidemic in sub-Saharan Africa has been staggering. As of 1999, 24.5 million, or 71%, of the world’s HIV/AIDS cases had occurred in Africa. In South Africa, which has the largest number of infected individuals, 4.2 million were living with HIV/AIDS. Overall prevalence in sub-Saharan Africa was 8.57% and 12 countries face a prevalence of at least 10%.

b. Asia
The impact of the HIV/AIDS epidemic in Asia has varied substantially from region to region. Southeast Asia, especially Thailand, saw an explosive increase in cases in the early 1990s. The introduction of infection in this region was initially through needle-sharing by injection drug users with the commercial sex industry accelerating the spread. Thailand currently has the highest reported estimated seroprevalence of HIV infection, 2% in the region. The HIV/AIDS epidemic is expanding rapidly in other East Asian countries including Cambodia, Myanmar, Malaysia, Vietnam, and China. In recent years, India has witnessed a sharp rise and currently has the largest number of known cases, 4 million despite an estimated seroprevalence of only 1%. Korea and Japan have reported relatively few cases and data from China are incomplete.

c. Latin America
The epidemic in South America followed a pattern similar to that in the United States. Homosexual men were the first group affected, followed by injection drug users, and, finally, heterosexual partners and children born to infected mothers.

d. Caribbean
Early in the epidemic in the United States it was recognized that recent immigrants from the Caribbean countries, especially Haiti and the Dominican Republic, who often had no apparent risk behavior, were being diagnosed with HIV infection. Heterosexual transmission accounts for the vast majority of reported cases at present, with 14% attributed to homosexual transmission. The estimated adult prevalence of HIV infection in Caribbean countries is over 2%, second only to that of sub-Saharan Africa. The lowest seroprevalence in the region is 0.02% in Cuba.

2. General Population: Europe
The estimated adult seroprevalence in Europe is 1%, comparable to that in the United States. As in the United States, the commonest mode of spread of HIV varies by region, with incidence rates rising quickly in Eastern Europe as a result of increased prevalence of injection drug use, although increased rates of heterosexual spread have also been seen. It is estimated that the total number of HIV-infected individuals doubled between 1997 and 1999 in states formerly of the Soviet Union. In Western Europe, a pattern similar to that in the United States has
been seen with homosexual men affected first, followed by injection drug users, heterosexual partners, and children born to infected women.

3. General Population: United States

Since HIV testing is not mandatory and universal and reporting of HIV infection is not required by all states, complete prevalence data for the U.S. population are not available. However, an indication of the number of HIV-infected individuals can be obtained from large-scale HIV screening programs, such as testing of military recruits and Job Corps applicants.

a. Military Recruits
Routine screening for HIV antibody has been conducted among applicants for military service (including ROTC and service academies) as part of their initial health assessment since 1985. Overall, HIV seroprevalence has declined among this population from 0.15% in 1986 to 0.035% in 1997 (197 men, 29 women). The relative prevalence among women has increased compared with that among men and, as in other cohorts, individuals of color are more likely to be infected.

b. Job Corps Applicants
Individuals entering the Job Corps have been routinely screened for HIV infection since 1987. Data for the period 1990 to 1996 revealed declining rates of infection and an overall seroprevalence of 0.2% (0.28% among women, 0.2% among men). As in the military data, prevalence was highest among African-Americans and Hispanics.

In interpreting data from the military and Job Corps it is important to recognize a potential bias because individuals who know that they are infected may be less likely to apply to organizations which require testing.

III. TRANSMISSION CATEGORIES: UNITED STATES

A. Mother-to-Child Transmission

HIV can be transmitted from mother to child before, during, and after delivery through breast-feeding (see Chapter 9), especially when the maternal viral load is high. An early triumph of antiretroviral therapy was the demonstration that zidovudine, and subsequently other drugs, could significantly reduce the rate of mother-to-child transmission. Because of the widespread practice of identifying infected mothers during pregnancy and administering appropriate therapy, the rate of transmission has fallen dramatically, from approximately 25% to less than 3%, in recent years in the United States. It has been suggested that the complete elimination of pediatric HIV infection is within reach in developed countries. In the developing world, however, where antiretroviral drugs may be scarce and where breastfeeding is often the only adequate means of providing nutrition to the newborn, this strategy has not had as significant an impact.
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B. Homosexual/Bisexual Men

In the early years of the HIV/AIDS epidemic in the United States, the seroprevalence of HIV infection among men who have sex with men (MSM) was astonishingly high in many areas. The San Francisco cohort study in the early 1980s indicated a baseline prevalence of 48.5%. The prevalence of infection was found to be highest (70.8%) among men who reported more than 50 sexual partners during the preceding 2 years and lowest (17.6%) among those who had abstained from sexual contact for that period. The vast majority of men (95.7%) in this series had practiced anal or orogenital sex or both, within the preceding 2 years. Receptive anal intercourse and the use of dildos or douches were the practices associated with the highest risk of infection. As the epidemic progressed and routes of transmission were better defined, changes in sexual practices resulted in a dramatic reduction in the number of new infections in this cohort—18.4% per year from 1982 to 1984 to 4.2% in early 1986. New York City data reflected a significant decline in other sexually transmitted disease (STD) among MSM during this period. This encouraging data must be balanced, however, by other observations indicating most of the decline in transmission of HIV infection has occurred among older homosexual/bisexual men. A steadily increasing proportion of reported AIDS cases has occurred among African-American and Hispanic MSM. Fifty-two percent of cases in MSM occurred in these ethnic groups in 1998 compared with 31% in 1989. Evidence of a continued high rate of transmission among young MSM has been reported. In 1996, a survey of urban STD clinics in several states indicated an average HIV prevalence of 7% among this group.

C. Heterosexual Transmission

HIV may be isolated from semen as well as from cervicovaginal secretions. Transmission of infection from males to females appears to be more efficient than it is from females to males. This is most likely related to the higher concentration of virus present in semen compared with that in cervicovaginal secretions. The larger volume of semen involved as well as more prolonged exposure of vaginal mucosa to infectious material may also play a role. Overall, the likelihood of transmission from male to female has been estimated to be 0.05 to 0.15% per sexual contact, while the likelihood of transmission from female to male is 0.3 to 0.9%. Other factors that appear to influence heterosexual transmission rates are discussed in Chapter 2.

D. Injection Drug Users

The prevalence of HIV infection among injection drug users in the United States has varied greatly from region to region and among various populations. In the 1980s, it was estimated that more than 60% of injection drug users in the New York metropolitan area were HIV-infected. The prevalence of HIV infection remained stable at 50% in separate cohorts of intravenous drug users in New York City studied in 1984 and again from 1990 through 1992, a finding which suggests a decline in
transmission rates after 1984. Changes in drug use behavior, particularly a decrease in reported needle sharing, appear to have been largely responsible for this decline. Nonetheless, as the proportion of reported AIDS cases among MSM has declined, the proportion among injection drug users has risen from 17% in 1983 to 22% in 1999. The prevalence of HIV infection in injection drug users is closely linked to heterosexual spread in the United States. As heterosexual transmission has accounted for an ever-increasing proportion of reported AIDS cases (4% in 1985 compared with 16% in 1999), over 50% of these individuals report sexual contact with an injection drug user.

E. Blood Product Recipients

Patients with hemophilia who had received therapy with factor VIII concentrate preparations were among the first individuals recognized to be at high risk for AIDS. By 1984, as many as 78% of such patients in the United States may have had HIV infection. Patients treated with cryoprecipitate or fresh frozen plasma and those with hemophilia B had much lower rates of infection. Overall, the likelihood of infection correlated with the quantity of exposure to clotting factor concentrates derived from large donor pools. Transmission of HIV infection by transfusion of other blood products was soon recognized.

The risk of HIV transmission via transfused blood products declined rapidly after universal screening of donated blood came into effect in the mid-1980s. After this screening began, it was estimated that the risk of infection fell to 1 in 40,000 units of blood. Further refinements of the screening process subsequently have likely reduced the rate even further. It should be recognized, however, that individuals who receive transfusions in areas of the world with significant HIV prevalence but lacking in effective HIV screening programs remain at risk.

IV. SELECTED PATIENT GROUPS: UNITED STATES

A. Patients Attending Sexually Transmitted Disease Clinics

Individuals diagnosed with sexually transmitted diseases are three to five times more likely to contract HIV infection. A median seroprevalence of almost 20% was found among gay men attending STD clinics in 16 U.S. cities. Heterosexual patients who injected drugs had a median prevalence of 4.8%. Patients diagnosed with sexually transmitted diseases should be strongly encouraged to undergo testing for HIV infection.

B. Female Commercial Sex Workers

The prevalence of HIV infection among women who trade sex for money or drugs is influenced by several variables. These include drug use, geographic location, race, and the setting in which the sex trade is carried out. Studies of women working in two distinct facets of the sex industry in New York City in the late 1980s indicated seroprevalences of 55% among street prostitutes and 1% for women working for...
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escort services or in massage parlors.\textsuperscript{34} In a more recent study,\textsuperscript{35} also from New York, nearly 35% of more than 1500 street prostitutes were infected. This proportion rose to 61% among those using injection drugs. Older age and Hispanic ethnicity were also associated with a greater likelihood of HIV infection in this study. In a study involving more than 2000 young women in New York, Miami, and San Francisco, over 30% of women who exchanged sex for money or drugs were found to be HIV-infected.\textsuperscript{28}

In the developing world published prevalence rates of HIV infection among female sex workers have reached remarkably high levels, especially in urban areas in Thailand (65%),\textsuperscript{36} India (29%),\textsuperscript{37} Peru (4 to 16%),\textsuperscript{38} and East Africa (15 to 36%).

C. Emergency Department Patients

The prevalence of HIV infection among patients visiting an inner-city hospital emergency room was examined by Kelen and colleagues.\textsuperscript{39} Overall, 5.2% of more than 2000 patients tested positive for HIV antibody. Black men between 30 and 34 years age were found to have the highest seroprevalence (11.4%). A statistically significant association between HIV infection and penetrating trauma was observed. Of patients denying HIV risk factors, 3.1% were seropositive. The prevalence of unrecognized HIV infection was 4%. Significantly, in a large multicenter study, Marcus and colleagues found that 69% of HIV-seropositive emergency patients were not known by hospital staff to be infected.\textsuperscript{40} Despite these facts and the large numbers of patients with sexually transmitted diseases who are seen in emergency rooms, most emergency departments reported that they did not routinely test these patients for HIV infection in a recently published survey.\textsuperscript{41}

V. OTHER GROUPS OF CONCERN: UNITED STATES

A. Women Who Have Sex with Women

Approximately 2% of adult and adolescent females reported with HIV/AIDS have a history of sexual contact with other women.\textsuperscript{42} The vast majority of these individuals report other potential risk factors for HIV transmission, especially injection drug use and sexual contact with high-risk men. Although the exact risk of female-to-female sexual transmission of HIV infection is unknown, it appears to be extremely low. No evidence for such transmission was found in an evaluation of over 90,000 female blood donors.\textsuperscript{33} Several apparent cases of such transmission have been described, however.

B. Household Contacts of Infected Persons

Early in the history of the HIV/AIDS epidemic, particularly before the causative agent was discovered, there was great concern that infection could be spread by casual nonsexual contact, specifically the forms of routine contact that might occur between members of the same household or between schoolchildren and their classmates.
Friedland and colleagues screened household nonsexual contacts, both adults and children, of HIV-infected patients and found no evidence of such horizontal transmission. One of 101 such household members was found to be infected: a 5-year-old child who was thought to have acquired the virus before birth. Despite sharing of such household items as toilets, towels, and in some cases razors, nail clippers, and toothbrushes with the infected individual for a median of 22 months, no household member acquired infection. Physical contact, including kissing, hugging, and helping to bathe and dress the HIV-infected family member, also was found to pose no risk of contagion in this study.

Although initial fears of widespread transmission of HIV infection within households have not been realized, rare instances of such horizontal, nonsexual transmission have been reported. In each case extensive exposure to blood or bloody fluids or both, of the index patient preceded transmission to the household contact.

C. HEALTHCARE WORKERS

From the beginning of the HIV/AIDS epidemic through the end of 1999, 56 instances of documented occupational transmission of HIV infection to healthcare workers had been reported in the United States, 39 (70%) of whom were nurses or laboratory technicians. An additional 138 cases of possible occupational transmission had been reported, 110 (68%) in the following occupations: nurse (35), clinical laboratory technician (17), health aide/attendant (15), emergency medical technician/paramedic (12), housekeeper/maintenance worker (13), non-surgical physician (12), and surgeon (6). In these cases, although no specific occupational exposure could be identified, no non-occupational route of transmission was apparent. The majority (86%) of documented occupational transmission came after needlestick exposures and overall, 88% of exposures leading to transmission were to blood.

VI. ADVANCES IN MANAGEMENT OF HIV DISEASE

A. NEWER ANTIVIRAL AGENTS

The impact of modern antiretroviral therapy on the HIV/AIDS epidemic in the United States and other developed countries has been profound. Among patients receiving effective therapy, survival and quality of life often improve greatly and the risk of opportunistic infection declines. Despite side effects and the inconvenience of taking the necessary numbers of drugs and pills, the development of these therapies has been the most important accomplishment of the past decade (see Chapter 10 and 11).

1. Failure to Improve Care for Certain Populations

As in other areas of medical progress, large segments of the population have been left behind by the advances in therapy of HIV/AIDS. Individuals of color and those confronting poverty, unstable living conditions, homelessness, substance abuse, or mental illness more often come to diagnosis and care late, encounter difficulty complying with treatment and follow-up and, as a result, manifest viral
resistance to even the most potent of current therapies. An increasing emphasis is being placed on improving access to and maintenance in care for such individuals. More comprehensive systems of care emphasizing convenience and flexibility as well as improvements in the tolerability of therapy will be critical in this effort.

VII. THE IMPACT OF AIDS

A. DEVELOPED COUNTRIES

Although the devastation wreaked by the AIDS epidemic has been most massive in the developing world, particularly sub-Saharan Africa, its impact in the United States and other developed countries has been remarkable. As just one illustration of this: it is estimated that 28% of HIV-infected adults living in the United States are the parents of minor children. The approximately 120,000 children so affected are often growing up in an environment where they are witnessing the deterioration of their parent’s health and, as a result, attempting to assist the parent in running the household, caring for siblings, and obtaining medical care.

1. Hospitalization

Since the advent of effective antiretroviral therapy and, with it, the decreased incidence of opportunistic infections, hospitalization rates and inpatient lengths of stay have, in general, declined substantially. At our institution, a municipal hospital in New York City, the average number of inpatients with AIDS-related diagnoses has fallen from a high of 35 in the early 1990s to fewer than 10, despite a growing outpatient population.

2. Systems of Care

Increasingly, it has been recognized that effective care of HIV-infected individuals often requires an extensive multidisciplinary approach. Medical and mental health providers as well as medical subspecialists (particularly in gastroenterology, oncology, and pulmonology) along with nonmedical specialists in dermatology, gynecology, neurology, and oral health are needed to provide appropriate screening and care. In addition, nurses, social workers, health educators, administrators, and a variety of other types of professionals are needed. Nonphysician practitioners including physician’s assistants and nurse practitioners are, for many programs, critically important. Because of the increasingly specialized knowledge needed to care for HIV-infected individuals, criteria for specialist certification have been developed in some locales.

B. DEVELOPING COUNTRIES

Access to care and appropriate medications remain enormous obstacles in the developing world, where the HIV/AIDS epidemic is most concentrated. With few exceptions, prevention campaigns have met with little or no success. The costs of antiviral medications and of the laboratory facilities required to monitor their use put modern
therapy far out of reach of most of the world’s HIV/AIDS population. The impact of the disease in the countries most affected will continue to grow far worse even if all HIV transmission were to stop.

**FREQUENTLY ASKED QUESTIONS**

1. **When did the first documented HIV infection occur?**
   
   Although AIDS was first recognized in 1980 and 1981 among male homosexuals in the United States, the earliest documented case of HIV infection dates to 1959 and was acquired in Africa.

2. **What region has the largest number of current HIV/AIDS cases?**
   
   Sub-Saharan Africa

3. **What region has the fastest growing prevalence of HIV infection?**
   
   The Indian subcontinent

4. **In what areas of the world is the incidence of HIV infection declining?**
   
   Thailand has seen a reduction in new cases since a sudden increase in the early 1990s. The number of newly reported AIDS cases in the United States has declined every year since 1993. Between 1993 and 2000, new adult cases fell from 78,834 to 25,341. The annual incidence of new HIV infections can only be estimated, since not all states require reporting of HIV infection without AIDS. It is possible that the prevalence of HIV infection is actually rising despite falling numbers of reported AIDS cases, since current antiretroviral therapy forestalls the development of AIDS and overall disease progression.

5. **In the United States, when did routine screening of blood for HIV begin?**
   
   1985

6. **What is the estimated seroprevalence of HIV infection in the United States population?**
   
   0.3%

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