Continuing Medical Education

A Podiatric Perspective of the Older HIV-AIDS Patient

Here's an update of the latest treatments available.

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Goals and Objectives

Participants completing this course will be able to:

1) Identify, acknowledge, and understand long-established known facts of HIV and AIDS and how the spectrum has changed over time.

2) Appreciate and understand the mechanism of the present therapeutics to treat HIV and AIDS.

3) Appreciate and describe the challenges facing older HIV and AIDS patients and how podiatric physicians may address them.

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Introduction

Acquired immunodeficiency syndrome (AIDS) and the human immunodeficiency virus (HIV) continue to be major health problems worldwide. HIV infection and severe HIV-related diseases have become one of the leading causes of illness and eventual death in the United States. Podiatric physicians are aware of the tremendous changes in research, patient care, and a cornucopia of therapeutics, and educational efforts have evolved to combat the HIV infection, resulting in patients infected with HIV and AIDS living longer and ushering in unique and overlapping challenges for podiatric physicians. People living with HIV (PLWH) currently require lifelong treatment through many stages of life. Historically, we have relied on education as the most effective weapon in our arsenal against the spread of AIDS. The management of HIV/AIDS involves the complex coordination of many healthcare professionals.

At this time, it may be necessary to focus on educational initiatives of healthcare professionals to develop strategies for effectively treating older people living with HIV successfully without adverse events. The central theme of this narrative is to focus on the podiatric physician's role when treating older patients living with HIV, who require lifelong treatment. First, as a foundation, a brief update review of epidemiology, transmission routes, confidentiality, and antiretroviral therapy is offered. Second, to provide the podiatric physician with a deeper understanding of the full

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weight and breadth of the aging HIV-infected patient, both comparative and contrasting data between these age groups are examined. Lastly, this paper provides treatment strategies for older patients living with HIV to empower podiatric physicians to enhance the care of these patients.

HIV Established Knowns

Epidemiology

On June 5, 1981, the U.S. Centers for Disease Control (CDC) reported five men with Pneumocystis carinii.[3-5] The Human Immunodeficiency Virus (HIV) was first identified in 1984, and throughout the last forty years, changes in therapy have happened almost every year. To date, no one has ever naturally recovered from HIV infection, and it is a known fact that HIV mutates frequently. Further, HIV antibodies only slow the disease but do not stop it. HIV vaccine tests in animals have not yet yielded accurate predictions of how the vaccines will work in humans. However, an inactivated HIV virus does not stimulate the immune system.

On March 4, 1983, the CDC listed Haitians as one of the four "high-risk" groups for AIDS. With a relatively high number of cases among recent Haitian immigrants, the CDC warned that "Physicians who care for Haitian patients should be aware that opportunistic infections may occur in this population." Other members of the "4-H" club were hemophiliacs, homosexuals, heroin addicts, and some also included "hookers".

The United States has made enormous strides in HIV treatment, care, and prevention since the epidemic began 40 years ago.[6] HIV was once the leading cause of death for young people, but because of scientific advances, fewer people are infected with HIV, and those who are live longer and healthier lives.[7-10] The rate of new HIV infections declined 73% between 1984 and 2019, and the age-adjusted death rate has dropped more than 80% since its peak in 1995.[11-13] However, in some ways, progress has stalled; too many people remain unaware of their HIV status, and the uptake of pre-exposure prophylaxis (PrEP) medicine has been slow.[12,13] In 2019, there were approximately 1.2 million people living with HIV in the United States.[14,15]

Further, in 2018, an estimated 1 in 8 people living with HIV in the U.S. did not know they had it.[12] In 2020, a total of 30,635 people received an HIV diagnosis in the U.S. and dependent areas.[16]

An estimated 1,189,700 people in the country had HIV at the end of 2019, the most recent year for which this information is available.[16] Of those people, about 87% knew they had HIV. The annual number of new cases decreased 8% from 2016 to 2019. In 2020, male-to-male sexual contact[16] accounted for 68% of all new HIV diagnoses in the U.S. and dependent areas. In the same year, heterosexual contact accounted for 22% of all HIV diagnoses. According to a review of HIV diagnoses by race and ethnicity, Black/African American people are most affected by HIV. In 2020, Black/African American people accounted for 42% (12,827) of all new HIV diagnoses. Additionally, Hispanic/Latino people are also strongly affected, as they accounted for 27% (8,285) of all new HIV diagnoses.[16]

The most effective way to prevent HIV infection is avoiding high-risk behaviors.

Modes of Transmission

1) MSM: male-to-male sexual contact (including persons with infection attributed to male-to-male sexual contact and injection drug use) accounted for approximately 70% of diagnosed HIV infections in the U.S.

2) Heterosexual contact accounted for approximately 24% of diagnosed HIV infections in the U.S.

3) Injection drug use (including persons with infection attributed to injection drug use and male-to-male sexual contact) accounted for approximately 9% of diagnosed HIV infections in the U.S.

Although HIV transmission is possible in healthcare settings, it is extremely rare. Practice of infection control procedures, including universal precautions (i.e., using protective practices and personal protective equipment to prevent the transmission of HIV and other bloodborne infections), protects patients as well as healthcare providers from possible HIV transmission in medical and dental settings. Nevertheless, healthcare personnel are at risk for occupational exposure to bloodborne pathogens, including HIV.

Important factors that influence the overall risk for occupational exposures to such pathogens include the number of infected individuals in the patient population and the type and number of blood contacts. Transmission of HIV to patients while in healthcare settings is rare; however, proper sterilization and disinfection procedures are required. The CDC has documented rare cases of patients contracting HIV in healthcare settings from infected donor tissue, receiving blood transfusions, blood products, or organ/tissue transplants that are contaminated with HIV. This was more common in the early years of HIV; today the risk is extremely small because of rigorous testing of the U.S. blood supply and donated organs and tissues.

Protective barriers reduce the risk of exposure of skin or mucous membranes to potentially infective substances.[1,2] All healthcare workers should use barrier precautions when exposure to the blood or body fluids of any patient is anticipated.[1,2] Gloves should be used to prevent exposure of the podiatrist's skin to patient's blood, body fluids, and non-intact skin. A new pair of gloves is to be used with each new patient, and hands should be washed immediately after each pair of gloves is removed. Needles should never be recapped, bent, broken, removed from disposable syringes, or manipulated by hand.[1,2]

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Podiatric physicians are aware of barrier methods, including gloves, gowns, masks, and face shields; in addition, aprons should be used whenever body fluids might splatter, soak, or permeate the podiatrist's clothing or may contact the skin.[1,2] Standard Precautions, previously called Universal Precautions, assume the blood and body fluid of ANY patient could be infectious. Therefore, it is recommended that personal protective equipment (PPE) is used and other infection control practices are followed to prevent transmission of bloodborne diseases in any healthcare setting. Decisions about PPE use are determined by the type of clinical interaction with the patient.[1,2]

The most effective way to prevent the spread of HIV is to avoid high-risk behaviors that lead to infection.[1,2] This may be accomplished by educational efforts geared towards both healthcare professionals and the public. Educational programs should be focused on preventing the spread through appropriate procedures that involve the handling of potentially infected body fluids and safe sexual activity practices.[1,2]

Confidentiality

Confidentiality and patient protection are key elements of the legislation regarding HIV testing in the state of Florida.[17,18] Informed consent must be obtained from a legal guardian or other persons when the individual is incompetent, incapacitated, or otherwise unable to make an informed judgment or has not reached the age of maturity. However, according to Florida Statute 384.,[30] minors can be examined, tested, and treated for sexually transmitted diseases without parental or guardian consent.[19] The patient should also be informed that a positive HIV test result will be reported to the county health department in Florida. When HIV testing returns, the person ordering the test or that person's designee must ensure that all reasonable efforts are made to notify the test subject of his or her results. The county health department contract provider or the healthcare facility or healthcare provider shall notify the patient of the results in person during a pre-scheduled return visit to the test site or a home visit by the healthcare provider.

No test results, negative or positive, shall be revealed to the patient by telephone or mail, except by blood banks or persons who collect blood, organs, skin, semen, or other tissue who find evidence of HIV infection in the donor. Patients should receive post-test counseling when the results are returned. Notification of a person with a positive test result should include information on the availability of appropriate medical and support services, the importance of notifying partners who may have been exposed, and prevention methods for the transmission of HIV. Notification of a person with a negative test result shall include, as appropriate, information on preventing the transmission of HIV.[17,18]

It is illegal to discriminate against individuals known to be infected with the HIV virus.[20] In fact, any person with or perceived as having an HIV infection shall have every protection made available to handicapped persons; to refuse to hire or to segregate or deprive these patients of employment opportunities based upon their HIV status is illegal. Furthermore, no person may require an individual to take a HIV-related test as a condition of hiring, promoting, or continuing employment unless the absence of an HIV infection is a bona fide occupational qualification for the job in question.

It is illegal to discriminate against individuals known to be infected with the HIV virus.

Anti-Retroviral Therapy

An untreated HIV infection may have detrimental effects at all stages of the infection. Anti-retroviral drugs should be used in HIV-infected patients. Treatment is beneficial even when initiated later in the infection; however, later therapy may not repair damage associated with viral replication during the early stages of infection. Earlier treatment may prevent the damage associated with HIV replication during early stages of infection. Anti-retroviral therapy for the treatment of HIV infection has improved steadily since the advent of potent combination therapy in 1996.[1,2] These drugs are called highly active anti-retroviral therapy (HAART). Anti-retroviral therapy is used to improve survival by reducing the viral load and increasing the CD4 + lymphocyte count. The effective use of anti-retroviral therapy is important in prolonging life and reducing the number of opportunistic infections.[1,2]

A highly active drug regimen is employed that uses combinations of drugs to suppress the replication of HIV and to restore a degree of immunocompetency to the host. This multidrug regimen is referred to as Highly Active Anti-Retroviral Therapy or HAART. The U.S. Food and Drug Administration (FDA) has approved more than 30 HIV medicines to treat HIV infection, some of which are available in combination (in other words, two or more different HIV medicines combined in one oral formulation). HIV medicines are grouped into seven drug classes according to how they fight HIV; a timeline of FDA approval is presented in Table 1.

Anti-retroviral Medications and Mechanism of Action

Nucleoside & nucleotide reverse transcriptase inhibitors (NRTIs). The nucleoside and nucleotide reverse transcriptase inhibitors are synthetic analogs of naturally occurring deoxyribonucleosides that are phosphorylated intracellularly. The first of such drugs was zidoduvidine (Retrovir®), which was approved in 1987.

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a. Non-nucleoside reverse transcriptase inhibitors (NNRTIs) and non-nucleoside/tide reverse transcriptase inhibitors ("non-nukes"). Members of the non-nucleoside reverse transcriptase class are structurally diverse and have similar mechanisms of action. They inhibit the reverse transcriptase enzyme system directly without having to be intracellularly activated by binding to the system itself and making it unavailable for use by the virus. Nevirapine (Viramune®) was the first of such drugs, approved in 1996.

b. Protease inhibitors are synthetic agents that are very potent and more active against the reverse transcriptase system when compared to both the NRTI and NNRTI classes. The first of these drugs was saquinavir (Invirase®), approved in 1995.

c. Fusion inhibitors block the fusion of HIV virus to host cells. The first and only one of these drugs is enfuvirtide (Fuzeon®), approved in 2003.

d. Integrase inhibitors block reproduction enzymes; the first of these was raltegravir (Isentress®), approved in 2007.

e. CCR5 antagonist keeps the virus from entering white blood cells. The first and only drug is maraviroc (Selzentry®).

f. Monoclonal antibody (blocks HIV-1 entry binding to domain 2 of CD4). The first drug approved was ibalizumab (Trogarzo®) in 2018.

Cabenuva®—the combination of cabotegravir or rilpivirine (an integrase inhibitor) and NNRTI—is indicated as a complete regimen for the treatment of HIV-1 infection in adults and adolescents 12 years of age and older and weighing at least 35 kg to replace the current anti-retroviral regimen in those who are virologically suppressed (HIV-1 RNA < 50 copies/mL) on a stable anti-retroviral regimen with no history of treatment failure and no known or suspected resistance to either cabotegravir or rilpivirine. Cabenuva® is administered as two intramuscular injections by a healthcare professional once a month or every two months. The most common adverse reactions in adults (incidence 2%, all grades) treated with Cabenuva® were injection site reactions, pyrexia, fatigue, headache, musculoskeletal pain, nausea, sleep disorders, dizziness, and rash. This formulation is unique and offers advantages that traditional HAART daily regimens do not. Adherence to the dosing schedule is strongly recommended.

Maraviroc (Selzentry®), a CCR5 antagonist, keeps virus from entering WBCs.

Antiretroviral therapy (ART) is recommended for all individuals with HIV regardless of CD4 T lymphocyte cell count to reduce the morbidity and mortality associated with HIV infections. Compliance or adherence to therapy is essential to ensure therapeutic effectiveness and minimize the occurrence of resistance. The podiatrist should be mindful of the potential drug interactions that exist with these agents so that they may be avoided when prescribing to the AIDS patient. However, challenges may vary in different age populations; for example, psychosocial turmoil may interfere with adherence in young adults, while comorbidity may pose significant problems in older adults. Therefore, it is essential to consider barriers to HIV care across the age spectrum, along with potential strategies to help patients of all ages, to achieve optimal clinical outcomes.

Cabenuva® is indicated as a complete regimen for the treatment of HIV-1 infection in adults; it is administered intramuscularly by a healthcare professional once monthly.

HIV in Older Adults

A growing number of older people live with HIV/AIDS, partly because improved treatments help people with the disease live longer. Nearly half of people living with HIV in the United States are aged 50 and older, and many of them were diagnosed with HIV in their younger years. However, thousands of older people are infected with HIV every year. Older people are less likely to get tested than their younger counterparts, thus they may not know they have HIV. Signs of HIV/AIDS can be mistaken for other diseases and/or the aches and pains of normal aging. Some older people may also feel ashamed or afraid of being tested. Additionally, doctors do not always think to test older people for HIV. Some people may not have access to high-quality health facilities and services, which can limit their treatment options. By the time an older person is diagnosed, the virus may be in the late stages and more likely to progress to AIDS. For people who have HIV, it is important to start treatment as soon as possible after diagnosis. Many older people have conditions such as heart disease or cancer that can complicate HIV treatment. Even when the disease is well controlled, people with HIV may develop aging-related conditions at a younger age.

HIV and its treatment can also affect other parts of the body, such as the brain and the heart; for example, people living with HIV are significantly more likely to develop cardiovascular disease than people without HIV. Older people living with HIV also have an increased risk of dementia, diabetes, osteoporosis, frailty, and some cancers. They also may be more likely to fall. Moreover,

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TABLE 1

FDA-Approved HIV Medicines

A Timeline with All the FDA Approval Dates for HIV Medicines, Categorized by Drug Class

1987	Zidovudine NRTI			
1991	Didanosine NRTI			
1992	Zalcitabine NRTI			
1994	Stavudine NRTI			
1995	Lamivudine NRTI	Saquinavir PI		
1996	Indinavir PI	Nevirapine NNRTI	Ritonavir PI	
1997	Combivir FDC	Delavirdine NNRTI	Nelfinavir PI	
1998	Abacavir NRTI	Efavirenz NNRTI		
1999	Amprenavir PI			
2000	Didanosine EC NRTI	Kaletra FDC	Trizivir FDC	
2001	Tenofovir DF NRTI			
2003	Atazanavir PI	Emtricitabine NRTI	Enfuvirtide FI	Fosamprenavir PI
2004	Epizicom FDC	Truvada FDC		
2005	Tipranavir PI			
2006	Atripla FDC	Darunavir PI		
2007	Maraviroc CA	Raltegravir INSTI		
2008	Etravirine NNRTI			
2011	Caomplera FDC	Nevirapine XR NNRTI	Rilpivirine NNRTI	
2012	Stribild FDC			
2013	Dolutegravir INSTI			
2014	Cobicistat PE	Elvitegravir INSTI	Triumeq FDC	
2015	Evotaz FDC	Genvoya FDC	Prezocobix FDC	
2016	Descovy FDC	Odefsey FDC		
2017	Juluca FDC			
2018	Biktarvy FDC Doravirine NNRTI Symfi Lo FDC	Cimduo FDC Ibalizumab-uiyk PAI Symtuza FDC	Delstrigo FDC Symfi FDC Temixys FDC	
2019	Dovato FDC			
2020	Fostemsavir AI			
2021	Cabenuva FDC	Cabotegravir INSTI		

Legend:

AI	Attachment Inhibitor	PE	Pharmacokinetic Enhancer
CA	CCR5 Antagonist	PI	Protease Inhibitors
FDC	Fixed Dose Combinations	PAI	Post Attachment Inhibitor
INSTI	Integrase Inhibitor		
NNRTI	Non-Nucleoside Reverse Transcriptase Inhibitor		
NRTI	Nucleoside Reverse Transcriptase Inhibitor		

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it is common for older adults with HIV to experience mental illness, especially depression and addiction, and they tend to be more isolated. About two-thirds of all older Americans with HIV say they have been victims of stigma, not only pertaining to their disease but also their age. Table 2 describes what we can do to erase that stigma and educate more people about HIV in the elderly.

TABLE 2

Suggestions for How Society Can Shift the Stigma and Start Diagnosing and Treating Seniors Earlier

Training health care providers in how to properly screen for HIV in order to make an early diagnosis.
Target prevention, education, and outreach programs toward older adults.
Publicize treatment guidelines for older individuals suffering from HIV.
Offer funding in line with this demographic.
Engage communities, local organizations and social service providers in regards to outreach, mental health, and social support.
Educate older people about preventing risky behaviors, utilizing age-sensitive information and education.
Encourage physicians to screen patients of all ages for HIV.

Challenges for Older HIV Patients

Older people with HIV face unique challenges because they are widely perceived by society, including healthcare professionals, as being at a lesser risk of contracting new HIV infections. Because society assumes that older people are not sexually active and do not use drugs, there are barriers to access protective health information and early HIV testing. Consequently, nearly half of older adults with HIV are diagnosed late in the course of their disease (defined as having CD4 cell counts among older people living with HIV (PLWH)); in 2015, 95% were aware of their infection, 69% received care, 56% were retained in care, and 60% were virally suppressed.[21-26]

Mitra, et al. suggest that older adults displaying new onset mood or cognitive changes must be screened for HIV infection.

Older people are more likely than younger people to have multiple comorbid conditions (multi-morbidity). However, older people with HIV also have higher levels of multi-morbidity compared with people of similar age without HIV. There is a considerable gap in research in understanding how HIV affects the aging process. Healthcare systems globally are not equipped to meet the needs of the growing population of older people with the condition. Healthcare systems provide fragmented care to older people with HIV, worsened by the lack of integrated ageing and HIV-related service and support systems.

Adverse effects from HIV and other medicines may occur more frequently in older people with HIV than in their younger counterparts. Age-related changes can also affect an older person's ability to think or remember, which can make it harder to stick to the HIV treatment regimen. While older patients tend to be more adherent than younger patients, some factors related to non-adherence may be more prevalent in this age group, such as high pill burden and medication cost, complex dosing requirements, limited health literacy, neurocognitive impairment, and depression.[21]

Additionally, healthcare professionals face several distinct challenges in caring for older adults with HIV, including 21-23 age-related co-morbidities that complicate HIV management; polypharmacy, which can lead to increased drug-to-drug interactions; early onset of frailty and other age-related clinical syndromes; and high rates of traditional risk factors, such as smoking, substance abuse, and obesity. Chronic inflammation in people living with HIV (even when virally suppressed on antiretroviral therapy) is associated with chronic illness, overall fitness, and increased mortality.

Multidisciplinary Teams

Multidisciplinary teams can work together to help tackle complex health issues and optimize medical care in older people living with HIV.[21] A 2018 update to the HIV and Aging Consensus Project—a set of clinical best practices for the treatment and care of older patients with HIV published by the American Academy of HIV Medicine (AAHIVM), American Geriatrics Society (AGS), and the AIDS Community Research Initiative of America (ACRIA)—highlights insights from the geriatric literature that may help inform older patients living with HIV. These include:[24] 1) Careful consideration of the toxicity risk from HIV and non-HIV medications, especially those with the potential for cumulative cognitive effects; 2) the development of care strategies to prevent and reverse functional decline, including early antiretroviral therapy (ART) as well as behavioral interventions to support improved adherence, smoking cessation, decreased alcohol consumption, decreased obesity, and increased exercise.[25,26]

Diagnosing frailty is important,

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as it is an independent risk factor for developing new chronic conditions, falls, cognitive decline, polypharmacy, hospitalization, loss of independence, and increased mortality.[27] An earlier onset of age-related co-morbidities and geriatric syndromes leads to aging trajectories referred to as either accelerated, wherein HIV accelerates processes of aging, or accentuated, where HIV is an additional factor increasing the risk of developing comorbidities.[28] Evidence to support both processes in people living with HIV have been demonstrated.[29,30]

In frail, older HIV-negative persons, the basic principles of care include an exercise program with a strength training component, protein-calorie supplementation if weight loss or undernutrition is present, assessment for polypharmacy[31], assessment and management of sarcopenia, evaluation and management of reversible causes of exhaustion (anemia, depression, hypothyroidism and B12 deficiency), and evaluation and supplementation of vitamin D if indicated.[32] Multicomponent frailty prevention programs have limited the progression of frailty and shown improvement in physical function and some cognitive domains.

Mental Health

Mental health disorders are a growing concern in aging people with HIV. A heightened risk of mood disorders, including anxiety and depression, has been observed in this population. Screening for depression and management of mental health issues is critical in caring for persons with HIV; therefore, the podiatric physician must consider these challenges when prescribing and monitoring medication therapy to older people living with HIV, as summarized in Table 3.

Mitra, et al. reviewed and asserted that most recent findings show that untreated HIV illness over a long period of time may further worsen both pre-existing neuropsychiatric illness and cause new onset behavioral and cognitive symptoms.[33] They also proclaimed that HIV induces immune phenotypic changes that have been compared to accelerated aging.[33] It is known that low CD4 counts and high viral counts are indicative of poor prognosis.[1,2,33] According to Mitra, et al., evaluation for potential HIV infections may be overlooked in older adults and require screening.[33]

Further, older adults experience accelerated CD4 cell loss. Mitra, et al. also suggest that older adults exhibiting new onset moods or cognitive changes must be screened for HIV infection, and new onset neurobehavioral symptoms should be carefully screened for and treated simultaneously in patients with HIV infection.[33]

Summary Points

Jaqua, et al. offer summary points centered on the impact of HIV infections in older patients.[34] Even though fall frequency in older adults living with HIV is similar to or lower than in people without HIV, fall assessment is appropriate, especially in the high-risk elderly living with HIV.[34] HIV also impacts motor function and memory loss, especially in advanced cases.[34] Anti-retroviral therapy (ART) does not cross the blood-brain barrier, leading to major neurocognitive disorders with age.[34]

The etiology of HIV and cardiovascular disease (CVD) is multifactorial, including the effect of ART.[34] Both pitavastatin and pravastatin cause fewer interactions with ART.[34] While the treatment for HIV decreases the risk of opportunistic infections, it may also cause several bone-related abnormalities, including low bone mineral density (BMD), osteoporosis, and fractures.[34] Moreover, polypharmacy is associated with disability and mortality and may increase the risk of ART drug-drug interaction.[34] People aging with HIV also have an increased mortality risk when co-infected with COVID-19.[34]

Jaqua, et al. offer the observation that the reason anti-retroviral therapy (ART) leads to major neurocognitive disorders with age is because ART does not cross the blood-brain barrier.

TABLE 3

Anti-retroviral Medication Challenges in Older Patients for Prescribers

Comorbidities are more common
The need to learn a new specialty, drug interactions, side effects of medication regimens in older patients
Are symptoms due to age, HIV, or medications
The importance of adherence and continuity of care
Need to understand and address the impact of stigmas (HIV, sexual minorities, ageism, drug abuse)
Older adults suffer more poverty and social isolation
Age-related disabilities along with HIV complications

Conclusion

The management of HIV/AIDS involves the complex coordination

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of many healthcare professionals. It requires educational efforts on the part of these professionals as well as the patients. Significant advances in the therapeutic management have occurred since AIDS was first reported. The role of the podiatrist in the management of AIDS-related illnesses is to actively provide care to older AIDS patients, be an active participant in educational programs and prevention strategies, safeguard staff from potential exposure, and protect the confidentially and the dignity of the patient. Early diagnosis and counseling to prevent secondary transmission remains an important aspect of the care of older people with HIV. **PM**

While the treatment for HIV decreases the risk of opportunistic infections, it may also cause several bone-related abnormalities, including low bone mineral density (BMD), osteoporosis, and fractures.

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Continued on page 117

HIV-AIDS *(from page 116)*

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Dr. Smith is in private practice in Ormond Beach, FL.

CME **EXAMINATION**

SEE ANSWER SHEET ON PAGE 119.

1) Identify maraviroc (Selzentry®), a CCR5 antagonist's mechanism of action.

A) It blocks HIV-1 entry binding to domain 2 of CD4
B) It blocks fusion of HIV virus to host cell.
C) It inhibits the reverse transcriptase enzyme system directly.
D) It keeps virus from entering WBCs

2) It is _____ to discriminate against individuals known to be infected with the HIV virus.

A) unethical
B) illegal
C) moral
D) legal

3) The most effective way to prevent HIV infection is _____.

A) ingestion of antibiotics
B) using hand sanitizer
C) obtaining HIV tests on every patient
D) avoiding high-risk behaviors

4) All factors related to non-adherence that may be more prevalent in an older age group include the following, EXCEPT:

A) high pill burden
B) medication cost
C) easy dosing requirements
D) neurocognitive impairment

5) Identify the barrier methods below that podiatric physicians should use whenever body fluids might splatter, soak, or permeate the podiatrist's clothing or may contact the skin.

A) gloves and gowns
B) masks and face shields
C) aprons
D) all the above are considered barrier methods

6) Mitra, et al. suggest that older adults displaying new onset mood or _____ must be screened for HIV infection.

A) hypertension
B) cognitive changes
C) hyperthyroidism
D) pain

7) Jaqua, et al. offer the observation that the reason anti-retroviral therapy (ART) leads to major neurocognitive disorders with age is because _____.

A) they are zwitterions
B) they are not absorbed in the digestive system
C) they are all completely excreted by the plasma
D) ART does not cross the blood-brain barrier

Continued on page 118

Continuing Medical Education

CME EXAMINATION

(Continure from page 117)

8) Cabenuva®, indicated as a complete regimen for the treatment of HIV-1 infection in adults, is administered _____.

A) intramuscularly by a healthcare professional once monthly.
B) topically by a healthcare professional once weekly.
C) orally by a healthcare professional once daily.
D) intravenously by a loved one yearly.

9) According to Jaqua, et al., while the treatment for HIV decreases the risk of opportunistic infections, it may cause several bone-related abnormalities listed below EXCEPT

A) Low bone mineral density (BMD)
B) Osteoporosis
C) Fanconi syndrome
D) Fractures

10) Reviewing the history of anti-retroviral therapeutic approval, identify the correct statement:

A) Saquinavir (Invirase®) was approved in 1995
B) Zidoduvidine (Retrovir®) was approved in 1987
C) (Isentress®) was approved in 2007
D) All Answers are Correct

SEE ANSWER SHEET ON PAGE 119.

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EXAM #5/23
A Podiatric Perspective of the Older HIV-AIDS Patient
(Smith)

Circle:

1.	**A**	**B**	**C**	**D**	**6.**	**A**	**B**	**C**	**D**
2.	**A**	**B**	**C**	**D**	**7.**	**A**	**B**	**C**	**D**
3.	**A**	**B**	**C**	**D**	**8.**	**A**	**B**	**C**	**D**
4.	**A**	**B**	**C**	**D**	**9.**	**A**	**B**	**C**	**D**
5.	**A**	**B**	**C**	**D**	**10.**	**A**	**B**	**C**	**D**

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Strongly agree [5]	Agree [4]	Neutral [3]	Disagree [2]	Strongly disagree [1]

1) This CME lesson was helpful to my practice ____

2) The educational objectives were accomplished ____

3) I will apply the knowledge I learned from this lesson ____

4) I will makes changes in my practice behavior based on this lesson ____

5) This lesson presented quality information with adequate current references ____

6) What overall grade would you assign this lesson?

A B C D

7) This activity was balanced and free of commercial bias.

Yes _____ No _____

8) What overall grade would you assign to the overall management of this activity?

A B C D

How long did it take you to complete this lesson?

_____hour _____minutes

What topics would you like to see in future CME lessons ? Please list :

_____

_____

_____

_____

_____