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HIV Over 50: Managing Complex Care

Zeina R. Ghayad, DO and Todd P. Levin, DO

NEW JERSEY AIDS Line

December 2010

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Course Code: 12HC04-DE01 • Nursing Credit for this activity will be provided through December 31, 2012.

To obtain continuing education credit, complete the quiz, registration, and evaluation on the following pages, or go to: www.umdnj.edu/ccoe/aids

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Funding
This activity is supported by an educational grant from the New Jersey Department of Health and Senior Services (NJDHSS) – Division of HIV/AIDS Services through an MOA titled “Education and Training for Physicians and other Healthcare Professionals in the Diagnosis and Treatment of HIV/AIDS.”

Target Audience
This knowledge-based activity is designed for physicians, nurses, pharmacists, social workers, and other health care professionals in New Jersey who are involved in the care of persons with HIV/AIDS.

Statement of Need
HIV patients age 50 and over are much more likely to have metabolic, cardiovascular, and renal disease, due both to HIV disease and HIV medications. HIV care focuses on monitoring of HIV markers including CD4 and viral load, and prescription of antiretroviral medications. Many HIV patients use HIV as their primary care. However, HIV specialists and clinics usually provide care under a specialty care model. There may be poor coordination between specialists, or patients may expect the HIV clinician to provide care for all comorbidities. For patients over age 50, HIV clinicians should identify and coordinate treatment for comorbidities usually managed in primary care or specialty care, such as cardiovascular and metabolic disorders including diabetes and impaired kidney function. Many patients will need to be referred to specialists for further diagnostic testing and treatment. These diagnoses and their treatment may affect the selection of a HAART regimen.

When HIV patients are seen by multiple specialists in separate practices or institutions, there may be incomplete diagnostic and treatment records available in the HIV practice or other specialty care.

Patients risk toxic interactions and effects when combinations are contra-indicated. The HIV clinical team should review all medications for patients with comorbidities to minimize interactions and consult with expert pharmacists as needed.

Learning Objectives
Upon the completion of this activity, participants should be able to:

1) Recognize the need to incorporate primary care approach to HIV care to address comorbidities including metabolic, cardiovascular, and renal disease, which are especially common in HIV-positive individuals over age 50.
2) Develop appropriate treatment strategies for HIV patients who also have metabolic, cardiac, and/or renal disease.
3) Explain risks of polypharmacy and other complications of co-managing HIV and these complex chronic illnesses.

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Method of Participation
Participants should read the learning objectives and review the activity in its entirety. After reviewing the material, complete the self-assessment test which consists of a series of multiple-choice questions. Upon completing this activity as designed and achieving a passing score of 70% or more on the self-assessment test; participants will receive a letter of credit and the test answer key four (4) weeks after receipt of the self-assessment test, registration, and evaluation materials; or may complete the activity on the internet at www.umdnj.edu/ceco. Estimated time to complete this activity as designed is 1 hour.

Accreditation
Physicians: UMDNJ-Center for Continuing and Outreach Education is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians. UMDNJ-Center for Continuing and Outreach Education designates this educational activity for a maximum of 1.0 AMA PRA Category 1 Credit™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Nurses: UMDNJ-Center for Continuing Education and Outreach Education is an approved provider of continuing nursing education by NJNSA, an accredited approver, by the American Nurses Credentialing Center’s Commission on Accreditation. Provider Number P173-10/09-12. Provider Approval is valid through November 30, 2012. This activity is awarded 1.05 contact hours. (60 minute CH) Provider approved by the California Board of Registered Nursing, Provider Number CEP 13780. Nurses should only claim those contact hours actually spent participating in the activity.

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Review
This activity was peer reviewed for relevance, accuracy of content, and balance of presentation by Patricia Kloser, MD, MPH; Debbie Mohammed, MS, MPH, APRN-BC, ACRN; Humberto Jimenez, PharmD, AAHIVE, Clinical Assistant Professor, Ernest Mario School of Pharmacy, Rutgers University; and Brenda Christian, MEd, PA-C; Director of AIDS Education, UMDNJ-CCEO; and pilot tested for time required for participation by Kinshasa Morton, MD; Shobha Swaminathan, MD; Joji Cheriyian, MD; Mary C. Krug, MSN, APN; Renee Powell, MS, RN; Kara Winslow, BSN, RN; Polly Jen, PharmD; John Faragon, AAHIVE; and George Rusuoljo, PharmD.

Disclosure Statement
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Disclosure Declarations
There were no relevant financial relationships to disclose reported by the activity director, faculty, planning committee members, peer reviewers or field testers.

Off-Label Usage Disclosure
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HIV Over 50: Managing Complex Care

Zeina R. Ghayad, DO and Todd P. Levin, DO

YOU WILL LEARN TO:

- Recognize the need to incorporate primary care approach to HIV care
- Develop appropriate treatment strategies
- Explain risks of polypharmacy

(See complete learning objectives on next page)

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LEARNING OBJECTIVES:

1. Recognize the need to incorporate primary care approach to HIV care to address comorbidities including metabolic, cardiovascular, and renal disease, which are especially common in HIV-positive individuals over age 50.

2. Develop appropriate treatment strategies for HIV patients who also have metabolic, cardiac, and/or renal disease.

3. Explain risks of polypharmacy and other complications of co-managing HIV and these complex chronic illnesses.

Introduction

Over the last several years HIV/AIDS has become a chronic medical illness as compared to a rapidly fatal disease at the onset of the epidemic in the 1980’s. The CASCADE collaboration revealed that in industrialized European nations, the excess mortality rate due to HIV/AIDS (per 1,000 person-years) decreased from 40.8 excess deaths in the pre-HAART era (before 1996) to 6.1 in 2004-2006.1 Because of the effectiveness of HAART, persons with HIV/AIDS are living longer. Epidemiologists predict that by the year 2015, roughly 50% of HIV-infected individuals may be aged 50 and older.5 If rates continue to increase as they have, this growing population of “geriatric HIV patients” will need a health system implemented just for them.

HIGH RISK activities such as unprotected sexual intercourse and drug use are often associated with activities of youth which can lead to acquiring and transmitting HIV infection. However, older persons also participate in risky behaviors. Condoms are often thought of as birth control and may not be used by persons past their childbearing years. Also, older men may feel that condoms can interfere with their sexual performance. The widespread use of phosphodiesterase inhibitors such as sildenafil (Viagra) may increase sexual activity in the older patient. Substance use, including injection drug use, begun in youth and young adulthood, may continue into later life. All of these issues contribute to the rising rates of persons acquiring HIV/AIDS over the age of 50.

At the end of 2006, an estimated 1,106,400 persons in the United States were living with HIV infection, with 25.3% being 50 years of age or older.2 In 2008, the CDC estimated that there were 56,300 new HIV infections in the United States, 10.3% of which were in persons older than 50 years of age.3,4

In the state of New Jersey, the population of people living with HIV/AIDS is older than the national epidemic. At the end of 2009, 40% of the 35,012 persons living with HIV/AIDS were 50 years or older, and there had been a cumulative total of 72,512 HIV/AIDS cases reported, including 11% who were 50 years of age or older when diagnosed,5 (Figures 1 and 3). This group includes many people who were diagnosed when they were in their 30s or 40s. New Jersey has seen a steady increase in the number of persons over age 50 living with HIV/AIDS, from 22% in 2002 to 40% at the end of 2009.5 (Figure 2)
Because of the effectiveness of HAART, persons with HIV/AIDS are living longer. Epidemiologists predict that by the year 2015, roughly 50% of HIV-infected individuals may be aged 50 and older. If rates continue to increase as they have, this growing population of “geriatric HIV patients” will need a health system implemented just for them.

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<td>35,012</td>
<td>100%</td>
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CASE STUDY #1

Presenting problem:
LW is a 51-year-old man who presented to the hospital in December of 2007 with a three-day history of weakness, lethargy and a non-productive cough. He was intubated in the Emergency Department because of respiratory distress and had a fever of 101.7°F. A chest X-ray revealed right-sided alveolar opacities and he was started on ceftriaxone and azithromycin with a preliminary diagnosis of community acquired pneumonia. He was in acute renal failure and started on hemodialysis, and admitted to the hospital.

History:
His past medical history was significant for hypertension, arthritis in his right knee, and anal warts. His surgical history included a skin graft placement, hernia repair, and bullet removal from his left leg. He smoked one pack of cigarettes daily, drank two beers daily, and used cocaine both intranasally and intravenously. He was incarcerated from 2006 to 2007. He lived at home with his wife of 17 years, although he reported that he had fathered two children, both under the age of 10, with another woman. He reported a blood transfusion in the 1970’s after the gunshot wound to his leg. He did not have any known drug allergies and did not take any medications on a regular basis. According to his wife, he had not seen a doctor in years.

Physical exam:
On physical examination his maximal temperature was 101.7°F and his blood pressure was 99/47 mmHg on dopamine. He weighed 285 pounds. He was orally intubated. He was lethargic but moving all extremities. His heart was regular without murmurs heard. His lungs revealed decreased breath sounds over the right base. His abdomen was obese, soft and nontender. He did not have lower extremity edema.

Laboratory findings:
On admission his WBC was 17,500/uL with 82% neutrophils and 16% lymphocytes. His hemoglobin was 13.2 and platelets were 227,000. His sodium was 126 mmol/L, potassium 5.6 mmol/L, CO2 21 mmol/L, BUN 65 mg/dL and creatinine 10.8 mg/dL. His ALT was 294 U/L and AST 1661 U/L. A MRSA nasal screen was positive, a sputum culture grew normal respiratory flora, and a urinary Legionella antigen was positive. A urine drug screen was positive for Pneumocystis jiroveci organisms. A hepatitis A IgM and total antibody were nonreactive, as were a hepatitis B surface antibody and hepatitis B surface antigen. A hepatitis C antibody was reactive with a HCV viral load of 4,710,000 IU/mL.

Discharge from hospital; outpatient treatment:
After 36 days in the hospital he was discharged on Bactrim SS (trimethoprim/sulfamethoxazole) three times a week, amlodipine, and oxycodone/acetaminophen.

In April of 2008, he followed up at the infectious diseases office. He was tolerating trimethoprim/sulfamethoxazole three times a week for PCP prophylaxis. His other medications included amlodipine and entapril. HIV genotype revealed a wildtype virus. An HLA B5701 test for abacavir hypersensitivity was negative. His creatinine was 1.8 mg/dL. We extensively discussed the importance of medication adherence on his follow up visit two weeks later, and he was started on efavirenz 600mg orally nightly, lamivudine 150mg orally daily, and abacavir 300mg orally every 12 hours. A hepatitis A and B vaccination series was started.

On follow up visits he was tolerating antiretroviral therapy and self reported 100% adherence. In October of 2008, his CD4 cell count was 252 cells/mL and viral load undetectable at <48 copies/mL. A hepatitis C viral genotype revealed genotype 1A, and a liver biopsy revealed chronic hepatitis C with Grade 2 (mild portal) inflammation and stage 1-2 (fibrous portal expansion and focal perportal) fibrosis. His creatinine improved to 1.3 mg/dL and the abacavir and lamivudine were changed to abacavir/lamivudine (Epzicom).

In March of 2010 his weight was up to 322 pounds and a fasting glucose was 132mg/dL. A repeat fasting glucose was 140mg/dL and he was diagnosed with diabetes mellitus and started on glyburide 5mg orally daily. In September of 2010 his weight was down to 289 pounds. He still stated 100% adherence to his antiretrovirals and his CD4 count was 270 cells/mL and viral load was <48 copies/mL. His hepatitis C will be restaged with a liver biopsy and treatment will be considered.

This case reinforces the importance of considering HIV as a diagnosis in persons over the age of 50. Primary care physicians and health care workers need to consider HIV in all over age 13, and obtain a history of drug use and sexual activity, regardless of the patient’s age.
Diagnosing older patients with HIV is often delayed for many reasons. HIV and HIV-related symptoms are often being attributed to other etiologies, such as dementia, lethargy, and failure-to-thrive, which can closely mimic HIV-related encephalopathy and wasting syndrome.

HIV Patients Over Age 50 Have More Chronic Illnesses

Beyond initial screening and diagnosis of older patients with HIV comes a new challenge to most primary care physicians, geriatricians, and infectious disease specialists. With the growing population of these individuals over the age of 50 comes the need to screen for and manage other comorbid conditions as well.

In non-HIV infected individuals, a third of all individuals will have one chronic illness by age 65. In contrast, by age 55, HIV-infected individuals will have four times as many comorbid conditions compared to those under 45.\(^\text{10}\)

In a study of 165 older patients with HIV, each had an average of 2.4 chronic conditions other than the disease, and took an average of 2.7 medications in addition to their HAART therapy.\(^\text{10}\) In addition to this, it appears that diagnosing older patients with HIV is still often delayed for many reasons. This is because of physicians’ lack of screening for HIV, and attribution of HIV-related symptoms in older individuals to other etiologies, such as dementia, lethargy, and failure-to-thrive, which can closely mimic HIV-related encephalopathy and wasting syndrome. The differences seen in baseline CD4 counts at the time of diagnosis have been attributed to lack of effective screening and testing in older adults.\(^\text{6}\) Thus the goal of primary care providers should begin with the prevention and diagnosis of the disease first and foremost. It is important to recognize the need to screen older individuals for HIV, especially in the presence of relevant risk factors and symptoms. The CDC currently recommends offering HIV testing to individuals between the ages of 13 and 64 regardless of the presence of known risk factors, as a routine clinical practice.\(^\text{7}\)

**FIGURE 4** Medical Characteristics of Older Versus Younger HIV-Infected Adults

**Older Adults are More Likely than Younger Adults to Have:**

- Decreased time span between HIV and AIDS diagnosis*  
- Lower CD4 cell counts at the time of HIV Diagnosis*  
- Slower rates of CD4 cell count increase after initiation of ART  
- Increased time span to viral suppression after initiation of ART  
- Lower peak CD4 cell counts on ART  
- Higher rates of comorbid illness, including cardiovascular disease  
- Increased mortality rates  

**ART** = antiretroviral therapy  

* Conflicting data in the literature; may be related to delayed diagnosis of HIV rather than a direct effect of age.

**Source:**  
The Older HIV-Positive Adult: A Critical Review of the Medical Literature
Age and HIV Disease Progression

Untreated older individuals with HIV progress more rapidly to AIDS than their younger counterparts. Several studies have shown that older HIV-infected individuals have a higher mortality rate than younger HIV-infected patients, however, most of these studies were performed before HAART was available.6 Also, the time to viral suppression after appropriate therapy is started seems to be slower in older patients. This could be due to the fact that both age and HIV contribute to a faster decline in immune function by decreasing both B-cells and T-cells. Age alone causes the thymus to produce hypo-responsive T cells and depletes patient’s stores of naïve CD4 T cells. Thus older individuals with HIV on HAART less often see their CD4 T cells increase as those younger than them would. In addition, more than half of older adults with HIV reach a diagnosis of AIDS or death in less than one year, which is in large contrast to younger adults and children, though the data on this subject is still conflicting.6 It has been suggested that HIV itself accelerates the aging process. This could be due to a multitude of comorbidities, lifestyle factors, and a chronic inflammation and/or immune activation which persists in HIV-affected individuals even with suppressed viral loads. Such entities as cardiovascular disease, non-AIDS cancers, and osteopenia are now all thought to be due to or exacerbated by HIV viral replication and chronic immune activation, which are all associated with aging. In contrast to this, one smaller study showed that increasing age at time of seroconversion, between ages 18 to over 40 years old, was actually associated with a better virological and CD4 cell response to HAART.13 The authors also found that older patients who seroconverted were able to maintain longer virus suppression before viral rebound than younger patients. Another larger study also showed that in 3,000 subjects, HIV patients over the age of 50 years at the time of initiation of HAART had virological response at a faster rate than those patients younger than them.16 Many reasons have been postulated for these outcomes, including better patient adherence to medication at older ages, as well as differences in drug absorption and metabolism.

Age, HIV, and Antiretroviral Therapy: Effects on Metabolism

The combination of HIV, aging, antiretroviral therapy, and many other medical conditions, is a clinical scenario in which care and attention is needed. It is known that the kidneys, the brain, as well as cholesterol, and bone mineral density (BMD) are affected by HIV. However, conclusions of individual studies on HIV and age related to these conditions are less clear. The HIV metabolic syndrome has been identified in many HIV-individuals who have started treatment, and in part may represent something known as the “return to health” phenomenon,7 in which successful introduction of a combination antiretroviral treatment causes weight gain. The rate of diabetes mellitus in HIV-infected patients receiving combination antiretroviral therapy has ranged from 5.7 to 47 per 1,000 patient-years, which rates are up to four-times as much as in HIV-negative patients.7 Among HAART medications, the greatest risk is found with stavudine, followed by zidovudine and didanosine.7 In diabetes mellitus and in aging, there is a depletion of skeletal muscle mitochondrial content. With the combination of this depletion and the mitochondrial toxicity associated with nucleosidase reverse transcriptase inhibitors, there is an increase in diabetes with combination antiretroviral therapy. Additionally, the use of protease inhibitors has been shown to be associated with increased insulin resistance. It is important to not only treat HIV-positive individuals with increased insulin resistance early, with diabetes medications or life-style changes, but to also avoid drugs that can lead to these specific toxicities in HIV-positive individuals with metabolic risk factors.
Renal Disease

KIDNEY FUNCTION DECREASES WITH AGE AND HIV INFECTION. The incidence of kidney disease in HIV-infected patients increases with age and the type of HAART medications used in treatment. Kidney disease is much more common in HIV-infected African-American individuals, and is exacerbated by depletion in CD4 T cell stores, lack of viral suppression, and HIV virus replication in the kidney itself. Along with the HIV-positive individual’s increased risk of chronic kidney disease comes a vicious cycle of decreased drug clearance and the risk of HIV drug toxicities. This can contribute to increased mortality due to cardiovascular events. Additional risk factors for loss of kidney function include age greater than 45, a CD4 T cell count less than 200, and a ritonavir-boosted protease inhibitor drug regimen. The increased rates of hypertension, diabetes, and hyperlipidemia in HIV-infected individuals can also contribute to high rates of renal disease in this population.

Cardiovascular Disease and Age

Aging has also been independently associated with increased risk of myocardial infarction (MI) in HIV-infected individuals. Multiple factors for this rise in cardiovascular risk have been shown, including early atherosclerosis development, antiretroviral toxicity, and endothelial dysfunction. Elevations in C-reactive protein (CRP) even in well-controlled HIV patients have been shown, and links between CRP, increased vessel wall thickness and the occurrence of MIs have been shown. Thus screening and management of dyslipidemia and hyperlipidemia in aging HIV-infected population is necessary. In the post-HAART era, there are numerous ongoing studies of the effects of long-term use of HAART. One such prospective, multi-cohort study, the Data Collection on Adverse Effects of Anti-HIV Drugs (DAD) study has shown that PI-based regimens are associated with increases in MI risk for patients, mainly because of increases in total cholesterol, triglycerides, and LDL levels. In addition, analysis of NRTIs from the DAD study has also suggested that there is an increased risk of cardiovascular events in those currently on abacavir and didanosine. How these drugs create an increased risk is still uncertain. The authors of the study derived an association with vascular inflammation caused by the drugs that was quickly reversed when they were stopped. This, however, remains controversial since it has been both corroborated and contradicted in other studies. Furthermore, the NNRTI class of drugs has also been implicated in development of dyslipidemia, but the mechanism as to how two commonly used drugs in this class, efavirenz and nevirapine, cause an increase in MI, remains unclear. Not only are these individuals at risk because of medication regimens, but also because of the proatherogenic state caused by HIV infection. As a consequence, older individuals are also doubly at risk for cardiovascular disease. Treatment strategies in this case would require avoidance of whole classes of HAART therapy, if possible, in those aging HIV-patients with significant cardiovascular risk factors.

Bone Health

People with HIV have higher rates of osteoporosis, osteopenia, and vitamin D deficiency. These comorbidities have become more common metabolic complications in the aging HIV population.

ONE META-ANALYSIS REVIEW of cross-sectional studies found that patients treated with combination HAART were 2 to 3 times more likely to have lower bone mineral density (BMD) than those not yet started on treatment. However, there is conflicting evidence as to whether it is in fact a result of HIV infection or antiretroviral therapy that bone loss occurs. One study found an overall fracture prevalence to be 50% higher in HIV-infected versus non-infected individuals. Fractures also occur at younger ages in HIV-infected individuals than those who are not infected. Studies have also shown that continuous HAART versus intermittent therapy has been associated with reduced BMD, implying an effect associated with drug therapy. Although studies with alendronate have shown to significantly increase BMD in HIV-infected individuals, none have actually specifically targeted older HIV individuals. Rates of bone loss appear higher with PIs or some NRTIs associated with initial ART regimens. Thus more research is needed in this area. But preliminary discussions have established the need to address this condition in the older HIV population, as the risk of osteopenia, osteoporosis, and fracture remains.
Hepatitis C and Liver Disease Progression

It can also be deduced that the effect of aging and HIV on the patient’s immune response can lead to complications with co-infection with Hepatitis C (HCV). Liver disease alone has become a leading cause of mortality in patients receiving combination ART. In fact, factors such as older age, CD4 cell depletion, uncontrolled HIV viral replication, and HBV or HCV co-infection, among others, are strong predictors of liver-related deaths in HIV-infected patients. The rate of progression of HIV is accelerated with HCV and HBV infection, compared to HIV alone. In older patients, there is a decline in liver volume, blood flow, drug metabolism and the ability of the liver to regenerate as patients get older. With HIV and HCV co-infection added to the picture, a complicated scenario of drug toxicities and increased mortality emerges. Both NNRTIs and PIs are metabolized by the liver, however, the lower hepatic mortality that comes with the increase in CD4 count achieved with combination therapy seems to outweigh the adverse affects of these medications.

Cancer and Neurotoxicity

People with HIV have higher rates of non-AIDS related malignancies. This risk is independently associated with older age, smoking status, as well as longer exposure to HAART. Transplant patients when compared to HIV patients show a similarity in the cancers observed, which suggests a role in cancer development of lower CD4 cell counts and the decreased effectiveness of the immune response and/or greater inflammation. An ever bigger area of study includes cognitive impairment as a well-recognized manifestation of ongoing HIV infection. As the HIV population ages, there is now more recognition of the overlap between HIV-associated dementia and Alzheimer’s Disease (AD). The pathology typically seen in AD has been reported in HIV-infected patients, including increased brain B-amyloid deposition and increased intracellular amyloid plaques. The Hawaii Aging with HIV-1 Cohort study showed that older adults may be three times more likely than younger patients to meet the criteria for HIV-associated dementia. Treatment with HAART, with its associated neurotoxicities, may also play a role. There is still a lack of research in this area, such that adequate treatment and prevention regimens for these individuals are not known. It can be assumed that medications used to slow the progression of Alzheimer’s Disease in older individuals now may be beneficial to the aging HIV population. HIV should be recognized as a possible contributor to cognitive impairment in the elderly patient who is assumed to be HIV-negative.

Care of the HIV+ Patient Age 50 or Older: A Comprehensive Health Approach

In the current era, where HIV is seen as a chronic medical condition in an expanding older population, attention needs to be given to the care of these individuals. Appropriate screening and awareness of drug regimens and potential toxicities need to be recognized in order to prevent sudden death, for example. Routine blood work, preventative medicine, as well as health maintenance, are crucial to the primary as well as sub-specialty care of older HIV-infected patients. Baseline panels of cardiovascular risk assessments, lipid panels, and complete metabolic profiles as well as regular monitoring of these levels are required. Bone mineral density assessments in the form of blood work and/or DEXA scans should also be routinely ordered. Attention should be paid specifically to prevention of concurrent diseases in order to avoid comorbidity diagnoses occurring at the same time, either with or after an HIV diagnosis is made. In short, screening should be comprehensive, and should include a holistic approach to the individual, including physical, social and mental health. Patients should be guided at an earlier age on the importance of diet and exercise, not only to prevent comorbid diseases, but to implement in their daily living, from the moment they are diagnosed with HIV and onward.
Guidelines should also be based on a “functional status” in HIV-infected individuals, much as is done with other chronic conditions, such as cancer and COPD. The notion of frailty has been used to assess the overall status of an HIV-infected individual. This is constituted by the presence of unintentional weight loss, low physical activity level, exhaustion and slowness. The likelihood of being frail increases with age, duration of HIV infection, having less than 350 CD4 cells, and having high viral loads. Frailty thus is associated with poorer outcomes in HIV patients, who are more likely to progress more rapidly to frailty than non-HIV patients. This supports an argument for the CDC recommendations of routine HIV testing to be expanded to individuals 65 and older. Other changes to treatment strategies include the possible need to screen and monitor HIV-infected individuals for age-related comorbidities earlier than their non-infected cohorts. Attention should still be paid to the primary care physician as the overseer of their care, but communication among specialists is key. The ability to have specialists on hand, perhaps even the same day and in the same location as primary care visits, could facilitate coordination and continuity of care. Education about the health complications faced by HIV-positive individuals over age 50 should begin early for both of the HIV-infected individual and the clinician. Older individuals should be counseled on safer-sex practices and avoidance of drugs as much as younger populations should. Clinicians should also be taught about the growing population of older HIV patients as early as medical school.

**CASE STUDY #2**

**Presenting Problem and History**

BW is a 65-year-old woman who was diagnosed with HIV/AIDS in January of 2008 after her husband, LW (see Case 1), was diagnosed with AIDS. She presented to our office in February of 2008. She acquired HIV from her husband, with no other history of risks such as drug abuse or blood transfusions. She did not recall any illnesses consistent with the acute retroviral syndrome. Her past medical history revealed many comorbidities related to her advanced age including gastroesophageal reflux disease, hypertension, arthritis, and diverticulitis. She was allergic to sulfa which causes hives. Her chronic medications were amlodipine, enalapril, conjugated estrogens (Premarin), esomeprazole, acetaminophen, and a multivitamin.

**Physical Exam**

On physical exam she was afebrile with a temperature of 98.6°F, blood pressure 152/76 mm/Hg, and heart rate 122 bpm. She was 5 foot 2½ inches tall and weighed 122 pounds. She did not have thrush. Her heart had a regular rate and her lungs were clear to auscultation. Her abdomen was soft and nontender.

**Laboratory Results**

Bloodwork revealed a CD4 count of 793 cells/mm^3^ and a viral load was 96,696 copies/mL. A HIV genotype revealed wildtype virus. Her WBC was 6,400/uL, hemoglobin 11.6, and platelets 398,000. Her creatinine was 0.7 mg/dL, ALT 19 U/L, and AST 20 U/L. Hepatitis serology for A, B, and C were non reactive. She was given vaccinations for influenza, pneumococcus, and started on the Hepatitis B vaccination series. At this time antiretroviral treatment was not initiated, since she was considered asymptomatic and had a relatively high CD4 cell count. Counseling was provided, discussing the important of safer sex since it was possible that her husband’s virus could develop resistance, since he would likely be taking antiretroviral medications in the near future.

**Outpatient Care**

Over the next year and a half she remained clinically stable, but her CD4 count slowly decreased. By June of 2009 her CD4 count was 443 cells/mm^3^ and her viral load was 217,839 copies/mL. She was started on tenofovir/emtricitabine/efavirenz (Atripla). Two months later she was tolerating antiretroviral therapy and her CD4 count was 747 cells/mm^3^ and her viral load improved to 1,658 copies/mL, but her total cholesterol increased to 274 mg/dL, LDL 182 mg/dL, and HDL 70 mg/dL. She was started on pravastatin 40 mg orally daily. In September of 2010, her CD4 count was 886, viral load undetectable at <48 copies/mL, total cholesterol 239 mg/dL, LDL 179 mg/dL, and HDL 76 mg/dL. The pravastatin was increased to 80 mg orally daily.

This case again reminds us to consider HIV as a diagnosis even in someone who appears to be at low risk. Perhaps a more detailed family history would have led to a diagnosis of HIV at an earlier age.
Treatment Adherence and Complications

Several studies have shown that older adults maintain better adherence to their HAART than younger HIV infected patients, despite higher risks of drug toxicities and the presence of other medications in their daily regimens. A recent large retrospective study of patients initiated in HAART showed that adherence was the most important factor in older patients having better viral response and comparable long-term CD4 cell counts as younger patients. Research is still needed on the aging HIV patient population and such concerns as the pharmacokinetics and side effects of antiretroviral medications and safety profiles of newer classes of HIV medications. In general, antiretroviral medication is often delayed in individuals, and thus can be deduced, in older HIV individuals, because of concerns of drug: drug interactions and the effects of medications on pre-existing comorbid conditions. Many HIV infected individuals are co-infected with Hepatitis C, and thus there is concern about use of several HIV medications and their metabolism and potential toxicities with liver disease. This is also a concern for treatment of renal and cardiac disease, as all three conditions can greatly interfere with drug metabolism. Aging itself can also alter drug kinetics, including reduction in the cytochrome P450 system which can affect the metabolism of PIs and NNRTIs with other drugs metabolized in this system, including anti-fungals, anti-histamines, calcium-channel blockers, and psychotrophic drugs. For example, simvastatin and lovastatin are metabolized by the P-450 system and thus are contraindicated for anyone on a PI-based regimen. Lower doses of pravastatin, atorvastatin, and rosuvastatin are permitted, and increased in dosage as needed. Fibrates can often be used to lower triglyceride levels, however, there is risk of myopathy if fibrates and statins are used concurrently, so these individuals should be monitored. Switching patients to a lower dyslipidemic antiretroviral regimen is another consideration, though much easier said than done.

<table>
<thead>
<tr>
<th>Examples of Drug Interactions with HIV Medications</th>
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<tr>
<td><strong>Non-Antiretroviral Drug</strong></td>
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<td><strong>Rifabutin</strong></td>
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<td><strong>Decreased concentration of PI</strong></td>
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<tr>
<td><strong>Rifampin</strong></td>
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<td><strong>Proton-pump inhibitors (PPIs)</strong></td>
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<td><strong>H2-blockers</strong></td>
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<td><strong>Statins</strong></td>
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<td><strong>Corticosteroids</strong></td>
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<td><strong>Antihistamines</strong></td>
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<td><strong>Methadone</strong></td>
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<td><strong>St. John’s Wort</strong></td>
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<td><strong>SSRIs</strong></td>
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<td><strong>Benzodiazepines</strong></td>
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<td><strong>Calcium channel blockers (CCB)</strong></td>
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<td><strong>Beta Blockers (BB)</strong></td>
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<td><strong>Azole antifungals</strong></td>
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<td><strong>Phosphodiesterase type 5 (PDE-5) inhibitors</strong></td>
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CONCLUSION

Currently we are at a turning point in the era of HIV/AIDS. With the emergence of new, better tolerated antiretroviral therapies, the ability to suppress the virus has allowed HIV to emerge as a medical condition that patients can live with.

As the population of HIV patients over 50 continues to grow, so does the need for expanding our knowledge of this subject. We need to know what the implications are of living with this disease at an older age. Will patients no longer die of complications of HIV, but rather of complications of their other comorbid conditions? If this is the trend of HIV patient care in the future, then there should be an emphasis on focused attention to understanding and managing this patient to the best of our ability. We should remember the importance of treating the whole patient. For the individual with HIV over 50, this implies a very delicate balance between the HIV virus itself, the complications of the disease and that of its treatment, as well as complications of the aging process. These all, it would seem, go hand in hand. Thus it is the treatment of all aspects of the patient’s health that should be our long-term goal. HIV has evolved from a disease that kills into a condition where we continue to strive for survival.

REFERENCES


Resources

National Association on HIV Over Fifty (NAHOF) SAGE (Senior Action in a Gay Environment), NYC: CDC Webpage: HIV/AIDS – Persons Aged 50 and Over Data and bibliography on HIV prevention and treatment issues

http://www.hivoverfifty.org
http://www.sageusa.org (212) 741-2247
http://www.cdc.gov/hiv/topics/over50
Questions refer to the content of the article and the notes that follow. To receive CME/CE/CEU credit: complete exam, registration, and evaluation forms on-line at www.umdnj.edu/ccoe/aids or fill in the forms on the following pages, and mail or fax to UMDNJ-CCOE (see Registration Form).

1. Which of the following antiretroviral medication is associated with the greatest risk of developing Diabetes Mellitus type 2 in the older HIV-positive patient?
   A. Didanosine
   B. Efavirenz
   C. Stavudine
   D. Zidovudine

2. Which cholesterol-lowering medication is absolutely contraindicated in patients on combination therapy with a Protease Inhibitor (PI)?
   A. Atorvastatin
   B. Lovastatin
   C. Pravastatin
   D. Rosuvastatin

3. What is the “return to health” phenomenon?
   A. Overweight patients who are HIV-positive are started on HAART and make lifestyle changes.
   B. Patients who are HIV-positive are started on HAART and gain weight, developing metabolic syndrome and possibly Diabetes Mellitus 2.
   C. HIV-positive patients with metabolic syndrome that lost weight while continuing on their HAART.
   D. Patients who seroconvert to HIV-positive status and gain weight because of taking HAART.

4. Which of the following is NOT a risk factor that contributes to the loss of kidney function in HIV-positive individuals?
   A. Hyperlipidemia
   B. Ritonavir-boosted regimens
   C. Age >45
   D. CD4 count < 200

5. In what age range does the CDC currently recommend routine screening for HIV?
   A. Between 10 and 70
   B. Between 13 and 64
   C. Between 16 and 65
   D. Between 18 and 55

6. What percentage of persons living with HIV/AIDS in the State of New Jersey were over the age of 49 by the end of 2009?
   A. 10%
   B. 30%
   C. 40%
   D. 50%
CASE: A 58 year-old male is newly diagnosed with HIV and comes to your office for follow-up visit and to discuss treatment regimens. He has a history of CAD, hypertension, and hyperlipidemia. He is currently taking amlodipine (Norvasc) 5 mg daily, metoprolol (Lopressor) 50 mg BID, and lovastatin 40 mg qHS. His weight is 319 lbs. and his fasting glucose was 105 from lab results that you ordered one-week prior. DEXA scan results also showed parameters consistent with osteopenia.

7. Which HAART drug class has been proven to increase risk of MI in HIV-positive patients, and should be avoided in this man?
   A. Protease Inhibitors
   B. NNRTIs
   C. NRTIs
   D. Both A and B

8. If started on a Protease-Inhibitor based regimen, which drug levels does the patient run the risk of increasing?
   A. Rifampin
   B. Methadone
   C. St.John's Wort
   D. Amlodipine

9. Which class of drugs is most likely to cause this patient's fasting glucose to worsen?
   A. NNRTIs
   B. NRTIs
   C. NNRTIs and PIs
   D. NRTIs and PIs

10. Is this HIV patient more or less likely to have a fracture than someone who is the same age but does not have HIV?
    A. 30% less likely to have a fracture.
    B. No difference based on HIV status.
    C. 50% higher likelihood of fracture.
    D. 100% higher likelihood of fracture.
In order to obtain continuing education credit, participants are required to:

1. Read the learning objectives, and review the activity, and complete the post-test.
2. Complete this registration form and the activity evaluation form on the next page, and record your test answers below.
3. Send the registration and evaluation forms to: UMDNJ-Center for Continuing and Outreach Education
   - VIA MAIL: PO Box 1709, Newark, NJ 07101-1709
   - VIA FAX: (973) 972-7128
4. Retain a copy of your test answers. Your answer sheet will be graded and if you achieve a passing score of 70% or more, a credit letter and the test answer key will be mailed to you within four (4) weeks. Individuals who fail to attain a passing score will be notified and offered the opportunity to complete the activity again.

Online option: This activity will be posted at www.umdnj.edu/ccoe/aids where you may obtain a credit letter upon successful completion of the post-test and evaluation.

Please note: CE credit letters and long-term credit retention information will only be issued upon receipt of completed evaluation form.

**SELF-ASSESSMENT TEST**
Circle the best answer for each question.

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

----- PLEASE PRINT -----

First Name __________________________ M.I. __________________________ Last Name __________________________

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Affiliation/Specialty __________________________

Indicate the type of continuing education credit you wish to obtain as a result of your participation in this activity.

- □ Nurses: 1.05 CNE Contact Hour(s). Contact Hours Claimed: ______
- □ Physicians: 1.0 AMA PRA Category 1 Credit(s)™: Credits Claimed: ______
- □ Pharmacists: 1.0 CPE Contact Hour(s). Contact Hours Claimed: ______
- □ General: Continuing Education Units (CEUs) (up to 0.10) Claimed: ______

One credit/contact hour for each hour of participation. Continuing Education Units: one unit per ten hours of participation.
I attest that I have completed this activity as designed. I will report the number of credits/contact hours claimed during my filing of continuing education credit with professional organizations, licensing boards, or other agencies.

Signature __________________________ Date __________________________

Release date: December 1, 2010 • Expiration date: Credit for this activity will be provided through December 31, 2012.
Nursing credit for this activity will be provided through December 31, 2012.
A CE credit letter will be mailed to you in approximately 4 weeks.

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CE Activity Code: 12HC04-DE01 This form may be photocopied.
The planning and execution of useful and educationally sound continuing education activities are guided in large part by input from participants. To assist us in evaluating the effectiveness of this activity and to make recommendations for future educational offerings, please take a few moments to complete this evaluation form. Your response will help ensure that future programs are informative and meet the educational needs of all participants.

Please note: CE credit letters and long-term credit retention information will only be issued upon receipt of completed evaluation form.

PROGRAM OBJECTIVES:
Having completed this activity, are you better able to:

<table>
<thead>
<tr>
<th>Objective 1:</th>
<th>Recognize the need to incorporate primary care approach to HIV care to address comorbidities including metabolic, cardiovascular, and renal disease, which are especially common in HIV-positive individuals over age 50.</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
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<th>Objective 2:</th>
<th>Develop appropriate treatment strategies for HIV patients who also have metabolic, cardiac, and/or renal disease.</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
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<th>Objective 3:</th>
<th>Explain risks of polypharmacy and other complications of co-managing HIV and these complex chronic illnesses.</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
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OVERALL EVALUATION:

<table>
<thead>
<tr>
<th>The information presented increased my awareness/understanding of the subject.</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
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<tr>
<th>The information presented will influence how I practice.</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
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<tr>
<th>The information presented will help me improve patient care.</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
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<th>The faculty demonstrated current knowledge of the subject.</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
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<th>The program was educationally sound and scientifically balanced.</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
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<th>The program avoided commercial bias or influence.</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
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<th>Overall, the program met my expectations.</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
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<th>I would recommend this program to my colleagues.</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
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Based on the content of the activity, what will you do differently in the care of your patients? (check one)

☐ Implement a change in my practice.
☐ Do nothing differently as the content was not convincing.
☐ Seek additional information on this topic.
☐ Do nothing differently. System barriers prevent change.
☐ Not applicable. I do not see patients in my current position.

If you anticipate changing one or more aspects of your practice as a result of your participation in this activity, please provide us with a brief description of how you plan to do so.

May we contact you in two months to see how you are progressing on the changes indicated above?

☐ Yes. Please provide your email address. __________________________  ☐ No. I do not wish to participate in the follow-up assessment.

If you are not able to effectively implement what you learned at this activity, please tell us what the system barriers are (e.g., reimbursement issues, managed care rules, formulary decisions, countervailing practice guidelines, etc).

Please list any topics that you would like addressed in future educational activities.