

HIV and Aging Annotated Bibliography

Source: AETC HIV and Aging Workgroup

April 2015

This page includes reviews of selected articles related to HIV and aging, organized by general subject area. Please [contact us](#) if you have any feedback or suggestions for additional articles.

Sections

- [Assessment](#)
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Assessment

- **Ances BM, Hammoud DA. [Neuroimaging of HIV-associated neurocognitive disorders \(HAND\)](#). *Curr Opin HIV AIDS*. 2014 Nov;9(6):545-51.**
Once HIV enters the brain after initial infection, with time, it can lead to HIV-associated neurocognitive disorders. In this review, recently developed noninvasive MRI and PET techniques in HIV-infected individuals are analyzed. It is hoped that continued progress will allow novel neuroimaging methods to be included in future HIV-associated neurocognitive disorder management guidelines.
- **Ball SC. [Increased longevity in HIV: caring for older HIV-infected adults](#). *Care Manag J*. 2014;15(2):76-82. Review.**
In this article, the author outlines several practice points that are explained

thoroughly. Three of those points directly reflect the purpose of the HIV and Aging project. They are:

- HIV infection will soon be a disease of older patients, with more than half the infected population in the United States over the age of 50 years by 2015.

Here the author addresses the shift in HIV demographics relative to age. She goes on to state that there will continue to be people diagnosed at this stage in life due to various circumstances such as late diagnosis, late acquisition of infection, and the aging of earlier-diagnosed individuals. There is a need to be able to care for the newly infected older population and those who are longstanding patients. It is important to effectively manage this population along with the comorbidities presented in some people in this age group.

- Identifying older patients at risk of HIV infection is essential to getting them into care; earlier diagnosis and treatment are linked to improved outcomes.

The author goes on to explain that it is vital to assess the transmission risk of this age group not only due to increased risky sexual behavior, but because of higher prevalence rates. She goes on to state that the U.S. Centers for Disease Control and Prevention (CDC) has estimated that by the year 2015 more than half of the HIV-infected population in the United States will be over 50 years of age. The rationale is that people are living longer with better treatment and earlier diagnosis. On the other hand, people continue to have risk factors into this stage of life that put them at risk of spreading the disease and acquiring it as well.

- Multidisciplinary care for older patients with HIV is essential.

The importance of having a multidisciplinary care team for older patients often is emphasized for many reasons that go beyond the normal potential comorbidities into specifics such as decreased renal and hepatic function. Medications in general have an effect on these functions and the stress of HIV infection and antiretroviral therapy (ART) can pose additional challenges. Undergoing long-term treatment for those entering this age group also poses the possibility of decreased cardiopulmonary function.

Situations in which multiple care providers are treating patients with numerous medications poses a challenge if all parties are not working together to share information. This could lead to ineffective or unnecessary treatments and poor medication efficacy.

- **Brothers TD, Rockwood K. [Biologic aging, frailty, and age-related disease in chronic HIV infection.](#) *Curr Opin HIV AIDS.* 2014 Jul;9(4):412-8. Review.**

HIV has been transformed into a chronic disease by various effective therapies, and new problems have risen related to aging. This article reviews the aging process, the age-related deficit accumulation and frailty, and how these might be affected by chronic HIV infection.

- **Centers for Disease Control and Prevention. HIV among older Americans. Available at <http://www.cdc.gov/hiv/risk/age/olderamericans/>. Accessed February 18, 2015.**

CDC website on fast facts and numbers and general information on HIV in older Americans (aged 55 and over). Published in Nov 2013 and the data is from 2010, 2011.

- **Chen MF, Gill AJ, Kolson DL. [Neuropathogenesis of HIV-associated neurocognitive disorders: roles for immune activation, HIV blipping and viral tropism.](#) *Curr Opin HIV AIDS.* 2014 Nov;9(6):559-64.**

Despite the effectiveness of active antiretroviral therapy, this review discusses why HIV-associated neurocognitive disorders (HAND) persist. Protection of the central nervous system by antiretroviral therapy is incomplete owing to the combined effects of incomplete HIV suppression, persistent immune activation, and host comorbidity factors. Adjunctive therapies to antiretroviral therapies are necessary for more effective protection.

- **Cysique LA, Brew BJ. [The effects of HIV and aging on brain functions: proposing a research framework and update on last 3](#)**

years' findings. Curr Opin HIV AIDS. 2014 Jul;9(4):355-64.

Review.

This review highlights patients aging with HIV and the acceleration of normal aging processes and the facilitated expression of age-associated diseases. There is limited research for dramatic neurodegeneration in aging HIV-infected persons. The complex effects of age- and nonage-related comorbidities and key HIV effects (as opposed to only HIV status) need to be taken into account in future research by increasing sample size and selecting the most appropriate control group(s).

- **Edelman EJ, Tetrault JM, Fiellin DA. Substance use in older HIV-infected patients. Curr Opin HIV AIDS. 2014 Jul;9(4):317-24.**

Review.

It is critical that providers and researchers alike understand the impact of substance use on older HIV-infected patients and the potential treatment options. In this review, literature focuses on the most commonly used substances in order to outline the epidemiology, health consequences, treatment options, and latest research relevant to older HIV-infected patients.

- **Fazeli PL, Marquine MJ, Dufour C, et al.; The HNRP Group. Physical activity is associated with better neurocognitive and everyday functioning among older adults with HIV disease. AIDS Behav. 2015 Mar 3.**

The authors examined the physical activity, neurocognitive impairment, and instrumental activities of daily living among 100 older HIV-infected adults and found that higher levels of physical activity was associated with lower odds of neurocognitive impairment in the study population.

- **Gakumo CA, Enah CC, Vance DE, et al. "Keep it simple": older African Americans' preferences for a health literacy intervention in HIV management. Patient Prefer Adherence. 2015 Jan 29;9:217-23.**

This is a qualitative study of 20 African American older adults living with HIV using patient-centered participatory design methods and

semistructured individual interviews to determine the preferences of these patients for a health literacy intervention to promote HIV management. The study pointed out four major themes related to intervention development and design: keep health information simple; use a team-based approach for health education; tailor teaching strategies to patients' individual needs; and account for patients' low experience, but high interest, in technology.

- **Guaraldi G, Silva AR, Stentarelli C. [Multimorbidity and functional status assessment](#). *Curr Opin HIV AIDS*. 2014 Jul;9(4):386-97.**

Review.

This review conceptualizes multimorbidity and functional status impairment in people living with HIV and the implication of these conditions in clinical and research fields. The success of highly active antiretroviral therapy has significantly changed the clinical pattern of HIV infection, with the "graying" of the HIV-infected population a testament to its success. This has provided new challenges relating to the care of older patients, particularly with regard to the management of multimorbidity functional status impairment.

- **Hellmuth J, Milanini B, Valcour V. [Interactions between ageing and NeuroAIDS](#). *Curr Opin HIV AIDS*. 2014 Nov;9(6):527-32.**

Effective combination antiretroviral therapy has led to aging of the HIV-infected population, which in turn contributes to the prevalence of HIV-associated neurocognitive disorder (HAND). Biomedical advances in aging and neuroAIDS are summarized in this study by reviewing relevant articles from different databases.

- **Iwuji CC, Churchill D, Gilleece Y, et al. [Older HIV-infected individuals present late and have a higher mortality: Brighton, UK cohort study](#). *BMC Public Health*. 2013 Apr 26;13:397.**

In this 14-year cohort study of newly HIV diagnosed patients presenting in the United Kingdom, the authors examined factors associated with late HIV presentation (i.e., those presenting with CD4 counts less than 350 cells/mm³ or an AIDS-defining condition regardless of CD4 count) for 1,536 eligible patients, and factors associated with mortality for 1,965 eligible patients. Authors reported that 49% of patients in this cohort of newly HIV diagnosed

presented late. Factors associated with late presentation included adults over 50 years, male heterosexuals, African/Caribbean ethnicity, and diagnosed in earlier calendar periods (1996-2001 or 2002-2005). They found that there was overall improvement in early HIV diagnosis over time (authors suggest this was due to increased routine testing among men who have sex with men), but late presentation for adults over 50 years remained constant during the study. Authors reported that those older than 50 years and those diagnosed with CD4 counts less than 350 cells/mm³ were associated with higher mortality. In this study, late presentation was related to three times increased risk of mortality. Authors conclude that late presentation is common and continues in older adults and suggests expansion of routine HIV testing to increase early diagnosis.

- **Kaku M, Simpson DM. [HIV neuropathy](#). *Curr Opin HIV AIDS*. 2014 Nov;9(6):521-6.**

This review conveys HIV-associated distal symmetric polyneuropathy (HIV-DSP) and other HIV-related peripheral neuropathies in the post-highly active antiretroviral therapy era. The prevalence of those affected by HIV-DSP will continue to grow with the aging population of HIV-infected individuals. Compared with the diabetic neuropathy drug trials, trials in both symptomatic and disease-modifying agents for HIV-DSP have had little success. Other forms of HIV-related peripheral neuropathies are discussed briefly, and include acute and chronic inflammatory demyelinating polyneuropathy, autonomic neuropathy, polyradiculopathy, mononeuropathies, mononeuritis multiplex, cranial neuropathies, and amyotrophic lateral sclerosis-like motor neuropathy.

- **Mallon PW. [Aging with HIV: osteoporosis and fractures](#). *Curr Opin HIV AIDS*. 2014 Jul;9(4):428-35. Review.**

It is now understood that low bone mineral density (BMD) and fractures are more common in HIV-infected patients. This review details the epidemiology, pathogenesis, diagnosis, and management of osteoporosis and low BMD in HIV-infected patients, with a particular emphasis on aging.

- **Meeker RB, Asahchop E, Power C. [The brain and HAART: collaborative and combative connections](#). *Curr Opin HIV AIDS*. 2014 Nov;9(6):579-84.**

This review summarizes contemporary observations regarding the effects of highly active antiretroviral therapy (HAART) on the brain. HAART selection strategies are currently guided by efficacy, resistance testing, toxicity, potential drug interactions, and theoretical brain penetration. As improved strategies are developed to target the viral reservoir within the brain, greater knowledge of the effects of ARTs on neural tissues will be needed to operationalize their use in a rational manner that maximizes antiretroviral efficacy and minimizes the neurotoxic complications.

- **Nadkarni GN, Konstantinidis I, Wyatt CM. [HIV and the aging kidney](#). *Curr Opin HIV AIDS*. 2014 Jul;9(4):340-5.**

Although recent data do not support premature aging of HIV-infected individuals with respect to kidney disease, the risk of acute and chronic kidney disease is increased by HIV infection and its treatment. This review highlights unique considerations in the epidemiology, diagnosis, and management of kidney disease in older adults with HIV.

- **National Institutes of Health. [HIV and Aging: State of Knowledge and Areas of Critical Need for Research](#). *J Acquir Immune Defic Syndr*. 2012 Jul 1; 60(Suppl 1): S1-18.**

The response to antiretroviral therapy, susceptibility to HIV acquisition, and the progression of disease after infection all vary by age. Therefore, the Office of AIDS Research of the National Institutes of Health commissioned a working group to develop an outline of the current state of knowledge and areas of critical need for research in HIV and aging. The working group's findings and recommendations are summarized in this report.

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- Centers for Disease Control and Prevention. HIV among older Americans. Available at <http://www.cdc.gov/hiv/risk/age/olderamericans/> **New York Department of Health. HIV in Older Adults: A Quick Reference Guide for HIV Primary Care Clinicians** Available at <http://www.hivguidelines.org/clinical-guidelines/hiv-and-aging/hiv-in-older-adults-a-quick-reference-guide-for-hiv-primary-care-clinicians/> . Accessed on March 11, 2015. This is a quick reference guide for HIV Primary care clinician by New York Department of health and published in November 2013.
- Paisible AL, Chang CC, So-Armah KA, et al. [HIV infection, cardiovascular disease risk factor profile, and risk for acute myocardial infarction](#). *J Acquir Immune Defic Syndr*. 2015 Feb 1;68(2):209-16.

This article pointed out the excess cardiovascular risk and risk for acute myocardial infarction (AMI) in HIV-infected patients. The study reviewed 81,322 participants (33% HIV infected) without prevalent cardiovascular disease (CVD) from the Veterans Aging Cohort Study Virtual Cohort (prospective study of HIV-positive and matched HIV-negative veterans) participated in this study. The study concluded that the prevalence of optimal cardiac health is low in HIV-infected veterans. Among those without major CVD risk factors, HIV-positive veterans have twice the AMI risk. Compared with HIV- veterans with high CVD risk-factor burden, AMI rates were still higher in HIV-infected veterans. Preventing/reducing CVD risk-factor burden may reduce excess AMI risk among HIV-infected people.

- **Pratt G, Gascoyne K, Cunningham K, Tunbridge A. [Human immunodeficiency virus \(HIV\) in older people](#). *Age Ageing*. 2010 May;**39(3):289-94**. Review.**

This review article summarizes the epidemiology of HIV among older people, including data from the city of Sheffield, UK, and discusses specific and practical issues in older patients such as risk, diagnosis, guidelines for HIV testing and also update on ART including drug interactions and side effects.

- **So-Armah K, Freiberg MS. [Cardiovascular disease risk in an aging HIV population: not just a question of biology](#). *Curr Opin HIV AIDS*. 2014 Jul;**9(4):346-54**. Review.**

This review utilizes recently published literature that describes the relationship between HIV, biologic and environmental risk factors, and cardiovascular disease risk, with particular emphasis on the aging HIV population. In addition, it is demonstrated that these biologic and environmental factors may interact to increase the risk of cardiovascular disease in the HIV population.

- **Valcour V, Paul R, Neuhaus J, et al. [The effects of age and HIV on neuropsychological performance](#). *J Int Neuropsychol Soc*. 2011 Jan;**17(1):190-5****

This review highlights that both HIV and aging impact performance on neuropsychological testing. Results show limited evidence for the interaction

effects between HIV and the age on neuropsychological performance. It is concluded that older age does not significantly influence neuropsychological performance among HIV patients when seronegative controls are largely composed of individuals from a similar socioeconomic background.

- **Wingood GM, DiClemente RJ. Application of the theory of gender and power to examine HIV-related exposures, risk factors, and effective interventions for women. Health Educ Behav. 2000 Oct;27(5):539-65.**

This article highlights gender and interventions for women specifically. It does not address the population that is our focus. It fails to address the over-50 age group and only validated the female gender. Our focus is not addressed in this article.

Treatment

- **Abrass CK, Applebaum JS, Boyd CM, et al; American Academy of HIV Medicine and AIDS Community Research Initiative of America. Updated - The HIV and Aging Consensus Project. Recommended Treatment Strategies for Clinicians Managing Older Patients with HIV. Available at <http://hiv-age.org/clinical-recommendations>. Accessed January 11, 2015.**

The HIV and Aging Consensus Project has an extensive compendium of information on the clinical management older patients with HIV infection. This recent update to the group's treatment strategies expands the recommendations for addressing sexual health issues with older patients. Topics include assessments of sexual health during health care visits, changes in sexual physiology for men and women with aging, current epidemiology of sexual behavior for older patients, and incorporating HIV prevention education, such as discussions on barrier protection and PrEP, into the provision of preventive health care at routine office visits. This consensus statement is very timely and addresses an area of health that has been ignored for our aging adults.

- **Beer G, James M, Summers S. Growing older positively: The challenge of ageing with HIV; August 2014. Available at: <http://www.2020health.org/2020health/Publications/Publications-2014/HIV.html>. Accessed on March 11, 2015. [Online book]**

This report reviews how HIV is strategically planned for and managed in the U.K. today and develops recommendations for Government and the NHS in light of changes in the patient profile. The goal is to ensure that with appropriate care and support everyone with HIV can live a long and fulfilled life. This research was produced by 2020health as a consultancy project for Gilead.

- **Chirch LM, Hasham M, Kuchel GA. [HIV and aging: a clinical journey from Koch's postulate to the chronic disease model and the contribution of geriatric syndromes](#). *Curr Opin HIV AIDS*. 2014 Jul;9(4):405-11. Review.**

With the development and widespread use of antiretroviral therapies, growing numbers of HIV-infected individuals can live into advanced age. However, as more individuals confront the prospect of a life with HIV, both they and their providers will need to shift their focus toward a broader and more encompassing perspective that considers the impact of multiple coexisting conditions and age-related changes on outcome measures associated with function, independence, and quality of life. Therefore, there is an urgent need for increased dialogue among various disciplines, ensuring that the care of older HIV-infected individuals is guided by research that incorporates relevant functional outcome measures.

- **Costagliola D. [Demographics of HIV and aging](#). *Curr Opin HIV AIDS*. 2014 Jul;9(4):294-301.**

This review demonstrates why the HIV-infected population is aging in high-income countries. In addition, the rate and causes of death in comparison with the general population, and the impact of combined antiretroviral therapy on life expectancy. is described.

- **Gebo KA. [HIV and aging: implications for patient management](#). *Drugs Aging*. 2006;23(11):897-913**

The author presents a framework for viewing the issues facing the aging HIV patient. The author used the Centers for Disease Control and Prevention definition of aged patients as those ≥ 50 years of age. This review addresses the epidemiology of the aging HIV patient as well as the newly infected older person. It includes brief reviews of the differences in immunologic recovery and responses to ART. The section addressing ART was informative in terms of the general principles of the impact of ART on an aged individual, but was limited in that it is out of date regarding antiretroviral agents currently in use. The major utility of this article is to outline the various issues that face our aging HIV patients.

- **Holtzman C, Armon C, Tedaldi E, et al; HOPS Investigators. [Polypharmacy and risk of antiretroviral drug interactions among the aging HIV-infected population.](#) *J Gen Intern Med.* 2013 Oct;**28(10):1302-10.****

This five-year cross-sectional analysis among patients within the HOPS cohort examines the potential impact of polypharmacy on the risk of drug-drug interactions between antiretrovirals (ARVs) and other medications (non-ARVs). In this cohort of 3,810 patients, 7% of patients were prescribed at least one ARV/non-ARV combination that was contraindicated and 33% were prescribed a combination that had moderate or high evidence of interaction. There was an increased risk of being prescribed a contraindicated ARV/non-ARV combination seen in patients who were ≥ 50 years of age; those who had anxiety, dyslipidemia, or higher daily non-ARV medication burden; and those who had been prescribed an HIV protease inhibitor. The authors conclude that, as HIV-infected patients age and experience multiple comorbidities, ongoing reviews of current medications by providers may reduce risk of such interactions. The authors include recommendations on how to minimize drug interactions for aging HIV-infected patients including guideline resources, medication therapy management services that include pharmacists, drug interaction databases, and electronic medical records.

- **Hunt PW. [HIV and aging: emerging research issues.](#) *Curr Opin HIV AIDS.* 2014 Jul;**9(4):302-8. Review.****

Through this review, it is clear that several unresolved issues need to be addressed by the research community in the future. It is crucial in order to further improve the health of HIV-infected individuals in the modern treatment era. Recent studies have helped to better define the contribution of HIV to life expectancy and morbidity in the modern antiretroviral therapy (ART) era. However, questions remain about the generalizability of these findings to a future HIV-infected population that is expected to be much older. Furthermore, although a consensus has emerged that the persistent inflammatory state contributes to morbidity and mortality in this setting, the relative contributions of this process, health-related behaviors, comorbidities, and medication toxicities remain incompletely understood. These issues are addressed in this review and recommendations for prioritizing the future research agenda are included.

- **Johnson CJ, Heckman TG, Hansen NB, et al. [Adherence to antiretroviral medication in older adults living with HIV/AIDS: a comparison of alternative models.](#) *AIDS Care.* 2009 May;**21** (5):541-51.**

Despite increasing HIV seroprevalence rates in older adults, most research examining adherence to antiretroviral therapy (ART) has focused on young HIV-infected persons and, in general, has been atheoretical in nature. This study examined two ART adherence conceptual frameworks to determine whether these models generalize to HIV-seropositive older adults.

- **Justice A, Falutz J. [Aging and HIV: an evolving understanding.](#) *Curr Opin HIV AIDS.* 2014 Jul;**9**(4):291-3.**

It is now understood that there has been an increasing availability of effective antiretroviral treatment, and this has dramatically extended life expectancy for persons infected with HIV. However, experts have varying opinions on the research regarding the different treatment strategies for patients aging with HIV.

- **Kalayjian RC, Spritzler J, Matining RM, et al. [Older HIV-infected patients on antiretroviral therapy have B-cell expansion and attenuated CD4 cell increases with immune activation reduction.](#)**

AIDS. 2013 Jun 19;27(10):1563-71. This multicenter, prospective study of older (=45 years) and younger (18-30 years) HIV-infected adults, who took antiretroviral therapy (ART) for 192 weeks, examined the associations between age group, thymic volume, immune activation, and viral load on CD4 cell restoration; and age-associated immune activation compared with age-matched HIV-uninfected controls. Authors reported that older HIV-infected adults had fewer naive and total CD4 cells and higher markers of immune activation than younger HIV-infected adults while on ART. Reductions in immune activation resulted in increases of naive, memory, and total CD4 cells, but this was reduced in older HIV-infected adults and those with small thymuses. Older HIV-infected adults had more cardiovascular events, diabetes, HIV-associated events and death, and lower CD4 cell responses with viral load suppression than younger HIV-infected adults. There was no difference between the age groups in those who achieved initial viral load suppression, but the younger group had higher rates of viral load rebound. Compared with controls, older HIV-infected adults had faster rates of B-cell increase and higher counts, and had a slower rate increase in hepatitis A antibodies after vaccination, but higher hepatitis A antibody concentrations. Younger HIV-infected adults had more immune disturbances and smaller thymuses than controls. Authors concluded that these findings may demonstrate age-related differences and support further study.

- **Linsk NL. [HIV among older adults: age-specific issues in prevention and treatment.](#) AIDS Read. 2000 Jul;10(7):430-40.**
An overview of the prevention and treatment issues surrounding HIV among adults aged 50 years and over are discussed in this article.
- **Torres RA, Lewis W. [Aging and HIV/AIDS: pathogenetic role of therapeutic side effects.](#) Lab Invest. 2014 Feb;94(2):120-8. Review**
This paper reviews how HIV/AIDS and its therapy cause *premature* aging or contribute mechanistically to HIV-associated non-AIDS illnesses (HANA). There is a robust interplay between the mechanisms for aging, toxicity of HIV/AIDS therapy, and other events that together serve as a pathogenic foundation for the aging phenotype. This review article focuses

primarily on side effects of antiretroviral therapy and how those side effects impact development and prevalence of non-immunologically driven diseases in HIV/AIDS patients.

- **Tsoukas C. [Immunosenescence and aging in HIV](#). *Curr Opin HIV AIDS*. 2014 Jul;9(4):398-404. Review**
 This review focuses on the dynamic process of immune remodeling, also known as immunosenescence, which occurs during HIV infection, and how it impacts long-term comorbidities. There is hope for successfully treated individuals to achieve a longevity approaching that of the general population in this era of antiretroviral therapeutic efficacy.
- **Vigouroux C, Bastard JP, Capeau J. [Emerging clinical issues related to management of multiorgan comorbidities and polypharmacy](#). *Curr Opin HIV AIDS*. 2014 Jul;9(4):371-8. Review.**
 This article demonstrates that, despite the accessibility of effective antiretroviral therapy (ART), HIV-infected individuals are living longer but present with an increased incidence of age-related multiorgan comorbidities. New clinical issues have come about from these comorbidities, and age-associated frailty needs to be diagnosed and managed. Aging HIV-infected patients require appropriate screening for age-related comorbidities and personalized management to optimize their lifespan and quality of life.
- **Wang H, Kotler DP. [HIV enteropathy and aging: gastrointestinal immunity, mucosal epithelial barrier, and microbial translocation](#). *Curr Opin HIV AIDS*. 2014 Jul;9(4):309-16. Review.**
 In HIV infection, gastrointestinal dysfunction is very common. Treated patients are at risk of many complications of "premature" aging. Complications include cardiovascular disease, osteopenia, neurocognitive decline, malignancies, and frailty. This review summarizes the recent observations in this field.
- **Youle M, Murphy G. HIV Training and Resource Initiative; July 2010. [A comprehensive guide to better living for HIV-infected patients over the age of 50](#). Available at:**

<http://www.hivandhepatitis.com/recent/lipo/ComingAgeBook.pdf>.

Accessed on March 11, 2015. [Online book]

Prevention

- **Agate LL, Mullins JM, Prudent ES, et al. Strategies for reaching retirement communities and aging social networks: HIV/AIDS prevention activities among senior in South Florida. J Acquir Immune Defic Syndr. 2003 Jun 1;33 Suppl 2:S238-42.**

This article describes in detail a prevention initiative program targeting older individuals in South Florida: SHIP (Senior HIV Intervention Project). It targets both men and women of all sexual orientations. It discusses the design and elements of a successful program:

- Be sensitive to the beliefs and values of your audience
- Package the educational program in labels and titles that will be acceptable to the intended older audience such as "safe sex after 50" or "sex, seniors, and the new millennium."
- Locate HIV/AIDS programming for older adults within the context of other adult programs, such as osteoporosis for women and a local outbreak of hepatitis A.
- Tailor programming to match the physical needs and limitations of older adults: short presentations, question and answer sessions, less reliance on the use of technology.
Programming that takes into account the special characteristics and needs of transient (seasonal) residents has had some limited impact despite a general ambivalence in this subpopulation.

- **Arrington-Sanders R, Leonard L, Brooks D, et al. Older partner selection in young African-American men who have sex with men. J Adolesc Health. 2013 Jun;52(6):682-8.**

This article describes a mixed study involving YAAMSM and sexual behavior with older men. Interviews with a group of YAAMSM suggest that they may

seek older partners to fulfill desires for a stable, emotionally mature relationship, and for exposure to a larger community. It alludes to the importance of prevention strategies aimed at targeting adolescent MSM age-discordant relationships.

- **AVERT website**. Available at <http://www.avert.org/>.
AVERT is an international HIV and AIDS charity, based in the UK, working to avert HIV and AIDS worldwide, through education, treatment and care. This is a Global resource for HIV/AIDS education and information on prevention, transmission and testing, treatment and care, living with HIV, global epidemic, and HIV/AIDS science. In a particular session of living with HIV "Growing Older and Aging with HIV", HIV, aging and other health conditions seen in older adult and potential drug interactions of antiretroviral drugs with commonly used drugs for comorbidities in older adults living with HIV.
- **Brooks JT, Buchacz K, Gebo KA, et al. HIV infection and older Americans: the public health perspective. Am J Public Health. 2012 Aug;102(8):1516-26.**
The authors describe that HIV infection among the older population is on the increase, estimating that 10.8% of the HIV infections that occur annually in the U.S. are among adults =50. This article presents a framework for viewing issues facing the aging HIV population. This review addresses risk factors for older HIV-uninfected people and highlights the importance for risk reduction programs for the aging population. It addresses the following:
 - Continued risk for older HIV-uninfected adults
 - HIV testing for elderly adults
 - HIV risk-reduction programs for HIV-uninfected older adults
 - Adults aging with HIV infection
 - Older adults more likely to be diagnosed late with HIV
 - Inferior responses to ART in elderly
 - Burden of select chronic illnesses among HIV-infected patients

- Importance of primary and preventive care

- **Fredriksen-Goldsen KI, Emlet CA, Kim HJ, et al. The physical and mental health of lesbian, gay male, and bisexual (LGB) older adults: the role of key health indicators and risk and protective factors. *Gerontologist*. 2013 Aug;53(4):664-75.**

The author team for this paper has extensive experience in exploring health care issues related to LGB persons. In this analysis, they use a new methodology of a resilience conceptual framework. Resilience is defined as the beneficial behavioral patterns, functional competence, and cultural capabilities that individuals, families, and communities utilize under adverse circumstances. Using logistic regression analysis, the authors found that financial barriers, smoking, and obesity were health factors that predicted poor health outcomes. Interestingly, excessive drinking was not, but the authors posited that this may be a reflection of their definition. Internalized stigma and lifetime victimization were markers for predicting disability. Although this study does not specifically address HIV and aging, it deals with health issues for the LGB community and thus offers insights into predictors for poor health outcomes for this group of HIV-infected persons.

- **Jacobs RJ, Kane MN, Ownby RL. Condom use, disclosure, and risk for unprotected sex in HIV-negative midlife and older men who have sex with men. *Am J Mens Health*. 2013 May;7(3):186-97.**

MSM represent approximately 4% of the U.S. population but account for 53% of all people living with HIV/AIDS (PLWHA). The authors describe that there are complex factors affecting sexual risk of HIV infection among MSM, including drug use. They suggest that prevention programs may be more effective if they are tailored for older cohorts of MSM and address interpersonal communication, erection problems, and substance use to reduce health risks.

- **Justice AC. HIV and aging: time for new paradigm. *Curr HIV/AIDS Rep*. 2010 May;7(2):69-76.**

The author addresses the issues related to HIV and aging, noting that new infections are occurring in older individuals (21% of new AIDS cases are

among =50 years old) and, because of combination antiretroviral therapy, patients are living longer and developing a spectrum of non-AIDS diseases. The author also discussed a study about the usage of erectile dysfunction medications and increased high-risk behavior and HIV transmission specifically among men who have sex with men (MSM) and blacks.

- **Klein H. [A comparison of HIV risk practices among unprotected sex-seeking older and younger men who have sex with other men.](#) *Aging Male*. 2012 Sep;15(3):124-33.**

HIV is becoming an increasing problem for older adults. This study provides a comparison in understanding the HIV risk behaviors and the factors that underlie the risk-taking behavior of these issues among younger and older men who have sex with men. The data were collected from a national study of 322 men who use internet to find other men for unprotected sex through telephone interview.

- **Mustanski B, Newcomb ME. [Older sexual partners may contribute to racial disparities in HIV among young men who have sex with men.](#) *J Adolesc Health*. 2013 Jun;52(6):666-7.**

The authors discussed how disparities in HIV incidence cannot be explained by individual risk behavior but by the sexual network of black YMSM with older partners: YMSM reported being attracted to older men because of emotional, financial, and instrumental support. Thus, power imbalances in partnerships can have important implications for condom use.

- **U.S. Public Health Service. [Preexposure Prophylaxis for the Prevention of HIV Infection in the United States - 2014 Clinical Practice Guideline.](#) Available at <http://stacks.cdc.gov/view/cdc/23109>. May 14, 2014.**

These Guidelines summarize previous studies in HIV primary prevention and provide guidance for providers to use FTC/TDF for prevention of HIV infection. There is no age limit for the implementation of PrEP.

Psychosocial

- **Brennan DJ, Emlet CA, Brennenstuhl S, et al; OHTN Cohort Study Research Team and Staff. [Socio-demographic profile of older adults with HIV/AIDS: gender and sexual orientation differences.](#) *Can J Aging.* 2013 Mar;32(1):31-43.**

The authors focused their research on a cohort of PLWHA over the age of 50 living across Canada. Increased age is often associated with late HIV diagnosis and engagement in HIV care. In Canada and the United States, PLWHA over 50 are more likely to be diagnosed with AIDS within the first year after their HIV diagnosis than their younger counterparts. Older PLWHA also are more likely to have comorbid conditions that delay the diagnosis of HIV.

The study goal was to expand the available literature outlining the sociodemographic profile of HIV-positive Canadians over age 50. The findings revealed that a majority of over-50 PLWHA are white gay men. Their mean age was 57, and their personal income was \$20,000 annually. Several cross-sample analyses demonstrated differences in smoking habits, alcohol use, and viral load and CD4 counts.

The study also found that gay men are more likely than their heterosexual or female counterparts to live with an HIV diagnosis 10 years or longer. Gay men were more likely to engage in risk behaviors such as excessive alcohol use. Gay men had lower depression scores and overall better scores in mental health surveys, and they utilized HIV services more often.

The authors note that this study provides the first data on the sociodemographics of PLWHA in Canada. They suggest future research to investigate the differences found in the various PLWHA populations.

- **Chesney MA, Chambers DB, Taylor JM, et al. [Social support, distress, and well-being in older men living with HIV infection.](#) *J Acquir Immune Defic Syndr.* 2003 Jun 1;33 Suppl 2:S185-93.**

Study objectives in this article were to assess whether the association between perceived health functioning and psychological distress and well-being is moderated (or influenced) by social support and age. In addition, it was assessed whether the impact of social support on distress and well-being

was more pronounced for older than for younger men living with HIV infection/AIDS.

- **Grov C, Golub SA, Parsons JT, et al. [Loneliness and HIV-related stigma explain depression among older HIV-positive adults](#). *AIDS Care*. 2010 May;22(5):630-9.**

In the "Research on Older Adults with HIV" (ROAH) study, the authors administered self-assessments to 914 men and women over the age of 50 in New York City to determine associations between depression, loneliness, health and HIV-related stigma. Surveys were collected to evaluate self-reported depression, HIV-related stigma, five perceived health indicators (i.e., pain, physical function, social function, energy/fatigue and cognitive function), objective health indicators (i.e., recent CD4 count and AIDS diagnosis), loneliness, and drug use. Results showed that 39% of participants had major depressive symptoms. Both higher rates of loneliness and HIV-related stigma were linked to increased risk of major depressive symptoms. Two perceived health indicators, decreased cognitive function and reduced energy/increased fatigue, were significantly related to major depressive symptoms; and all five perceived health indicators were associated with stigma and loneliness. Authors concluded that researchers and providers must focus on both physical and psychosocial factors effecting older adults living with HIV, and that reducing loneliness and HIV-related stigma may decrease major depressive symptoms and improve perceived health.

- **Degroote S, Vogelaers D, Vandijck DM. [What determines health-related quality of life among people living with HIV: an updated review of the literature](#). *Arch Public Health*. 2014 Nov 17;72(1):40.**

As infection with the human immunodeficiency virus (HIV) has evolved to a chronic disease, perceived health-related quality of life (HRQoL) is becoming a prominent and important patient-reported outcome measure in HIV care. Literature discusses different factors influencing HRQoL in this population; however, no consensus currently exists about the main determinants. In this review, a clear, up-to-date overview of the determinants influencing HRQoL among people living with HIV is provided.

- **Emlet CA, Fredriksen-Goldsen KI, Kim HJ. [Risk and protective factors associated with health-related quality of life among older gay and bisexual men living with HIV disease.](#) *Gerontologist*. 2013 Dec;53(6):963-72.**

This article identified risk and protective factors associated with mental and physical health-related quality of life, after controlling for key background characteristics, in a population of older gay and bisexual men living with HIV infection. Previous research examining quality of life among persons living with HIV rarely included older adults. Comorbidity, functional limitations, and lifetime victimization are risks to quality of life among older gay and bisexual men with HIV disease. Self-efficacy and social support represent intrapersonal and interpersonal resources that can be enhanced through interventions to improve health-related quality of life.

- **Emlet CA, Tozay S, Raveis VH. ["I'm not going to die from the AIDS": resilience in aging with HIV disease.](#) *Gerontologist*. 2011 Feb;51(1):101-11.**

The research identified the importance of strengths and resilience among older adults living with HIV/AIDS. Further research is needed to explore these phenomena with larger samples. Practitioners should identify and implement methods for assessing resilience among older HIV-infected adults.

- **Fang X, Vincent W, Calabrese SK, et al. [Resilience, stress, and life quality in older adults living with HIV/AIDS.](#) *Aging Ment Health*. 2015 Jan 30:1-7.**

This review depicts the mediating effect of resilience on the relationship between life stress and the health-related quality of life in people aged 50 and older who are living with HIV/ AIDS (OPLWHA). It was shown that resilience may reduce the negative influence of life stress on physical, emotional, and the functional/global well-being in this population.

- **Gallego L, Barreiro P, López-Ibor JJ. [Psychopharmacological treatments in HIV patients under antiretroviral therapy.](#) *AIDS Rev*. 2012 Apr-Jun;14(2):101-11.**

The HIV patient population shows high rates of psychiatric conditions, thus the effective management of these conditions can enhance the quality of life and improve antiretroviral adherence of this population. This article reviews the indications and precautions to consider with the use of psychoactive drugs for HIV patients. The authors encourage prescribers of psychoactive medications to take into account the drug-drug interactions, medication tolerance of the HIV patient, presence of metabolic or cardiovascular abnormalities due to prolonged use of ART, history of substance abuse, and unexpected responses to psychoactive medications in HIV patients. More specifically, the authors discuss the use of anxiolytics, antidepressants, mood stabilizers, and antipsychotic drugs. Additionally, alcohol and substance-abuse treatment is discussed, including current recommendations for the use of methadone and naltrexone. Overall, psychotropic medications are effective treatment within the HIV patient population, and the appropriate use of these medications can improve the quality of life for these individuals. However, to further advance this area of research, more controlled studies are needed in the HIV patient population.

- **Gooding PA, Hurst A, Johnson J, et al. [Psychological resilience in young and older adults](#). *Int J Geriatr Psychiatry*. 2012 Mar;**27**(3):262-70.**

This study investigated psychological resilience in the older adults (>64 years) compared with that of the young ones (<26 years). Questionnaire measures of depression, hopelessness, general health, and resilience were administered to the participants. The resilience measure comprised three sub-scales of social support, emotional regulation, and problem solving. These results highlight the importance of maintaining resilience-related coping skills in both young and older adults but indicate that different psychological processes underlie resilience across the lifespan.

- **Heckman TG, Barcikowski R, Ogles B, et al. [A telephone-delivered coping improvement group intervention for middle-aged and older adults living with HIV/AIDS](#). *Ann Behav Med*. 2006 Aug;**32**(1):27-38.**

The Centers for Disease Control and Prevention predicts that 50% of all

cases of HIV/AIDS in the United States will occur in persons 50 years of age or older in 2015. This research tested whether a 12-session, coping improvement group intervention delivered via teleconference technology could improve life quality in 90 middle-age and older adults living with HIV/AIDS. Although findings from this research suggest that telephone-delivered, coping improvement group interventions have potential to facilitate the adjustment efforts of HIV-infected older adults, more rigorous evaluations of this intervention modality for this group are needed.

- Heckman TG, Kochman A, Sikkema KJ, et al. [Late middle-aged and older men living with HIV/AIDS: race differences in coping, social support, and psychological distress.](#) *J Natl Med Assoc.* 2000 Sep;92(9):436-44.

The current study examined race differences in stressor burden, ways of coping, social support, and psychological distress among late middle-aged and older men living with HIV/AIDS. Compared with their African-American counterparts, HIV-infected older white men reported elevated levels of depression, anxiety, interpersonal hostility, and somatization. African-American men also received more support from family members and were less likely to disclose their HIV serostatus to close friends. As AIDS becomes more common among older adults, mental health interventions increasingly will be needed for this group. The development of intervention programs for this group should pay close attention to race-related differences in sociodemographic, psychosocial, and behavioral characteristics.

- Hill L, Lee KC. [Pharmacotherapy considerations in patients with HIV and psychiatric disorders: focus on antidepressants and antipsychotics.](#) *Ann Pharmacother.* 2013 Jan;47(1):75-89.

HIV-infected individuals show a higher incidence of depression than the general population; furthermore, research suggests that concomitant depression with HIV can lead to worse HIV outcomes. Thus, the purpose of this review article was to evaluate literature regarding the efficacy, safety, and drug interactions of antidepressants and antipsychotics in patients with HIV. Based on the inclusion and exclusion criteria, the authors found 11

articles for depression treatment and 1 article addressing psychosis treatment. The authors' review of the use of SSRIs and tricyclic antidepressants showed that both appear to be effective in treating depression in HIV patients; the use of testosterone and stimulants also may be an option in the treatment of depression in HIV patients. There are very limited data on the use of antipsychotics in patients with HIV. The consideration of drug-drug interactions in the prescribing of antidepressants and antiretrovirals is important for clinicians to note, as is the increased susceptibility of HIV patients to extrapyramidal symptoms (EPS) and metabolic disturbance with the use of antipsychotics. The authors recommend larger controlled studies to further investigate superiority of agents, dosing ranges, and reduction of adverse effects in order to enhance treatment approaches for HIV patients.

- **Kalichman SC, Heckman T, Kochman A, et al. [Depression and thoughts of suicide among middle-aged and older persons living with HIV-AIDS](#). *Psychiatr Serv*. 2000 Jul;51(7):903-7.**

This study examined the prevalence and characteristics of suicidal ideation among middle-aged and older persons who have HIV infection or AIDS. People who are in midlife and older and are living with HIV-AIDS experience significant emotional distress and thoughts of suicide, suggesting a need for targeted interventions to improve mental health and prevent suicide.

- **Lin C, Li L, Ji G, et al. [Emotional social support and access to care among older people living with HIV in rural China](#). *Int J Geriatr Psychiatry*. 2015 Feb 6.**

This cross sectional study investigated 225 people living with HIV/AIDS (PLWHA) who were 50 + years of age or older in Anhui, China, through computer-assisted personal interview. The study findings point to the importance of providing emotional support for older PLWHA. It is suggested that emotional support should be provided for older patients in addition to tangible assistance, in order to engage them in treatment and care.

- **Liu H, He X, Levy JA, et al. [Psychological impacts among older and younger people living with HIV/AIDS in Nanning, China](#). *J***

Aging Res. 2014;2014:576592.

This study examined and compared self-efficacy, depression, well-being, and the quality of life among older and younger people living with HIV/AIDS (PLWHA) in China. The findings suggest that older PLWHAs face psychological problems and mental health challenges beyond those experienced by younger PLWHAs. Intervention programs dedicated to improving mental health and quality of life are greatly needed for HIV infected older adults.

- **Lutgendorf S, Antoni MH, Schneiderman N, Fletcher MA. [Psychosocial counseling to improve quality of life in HIV infection](#). Patient Educ Couns. 1994 Dec;24(3):217-35. Review.**

Psychosocial interventions such as cognitive behavioral stress management (CBSM), may enhance coping and social support, which contribute to an improvement of quality-of-life factors such as emotional functioning, social functioning, and sense of well-being, for HIV-infected men during several phases of HIV disease spectrum. Examining the relationships among coping strategies, social support, emotional well-being, realistic appraisals of one's functioning in comparison to their aspirations, and the influence of psychosocial functioning on disease course are central missions of our research program.
- **McGowan J, Sherr L, Rodger A, et al. [Effects of age on symptom burden, mental health and quality of life amongst people with HIV in the UK](#). J Int AIDS Soc. 2014 Nov 2;17(4 Suppl 3):19511.**

In this study, participants completed a questionnaire that included standard inventories on symptoms and health-related quality of life (HRQoL). Physical and psychological symptoms are common among people living with HIV, but the burden of these symptoms is not highest among the older age group. While HRQoL tended to worsen with older age, physical symptom distress did not, and mental health improved. This may reflect greater resilience in older adults, or the potential for "successful aging": maintaining mental health despite age-related health losses.

- **Moore RC, Eyler LT, Mausbach BT, et al. [Complex interplay between health and successful aging: role of perceived stress, resilience, and social support.](#) *Am J Geriatr Psychiatry.* 2014 Aug 15. pii: S1064-7481(14)00229-2.**

This review utilized moderate mediation analyses to examine the role of perceived stress in the relationships between physical and mental health functioning. In addition, it examined whether differences between people in the level of resilience and social support change the role of perceived stress in these relationships.

- **Moore RC, Moore DJ, Thompson WK, et al. [A case-controlled study of successful aging in older HIV-infected adults.](#) *J Clin Psychiatry.* 2013 May;74(5):e417-23.**

This study aimed to understand the risk and protective factors associated with self-rated successful aging (SRSA) with HIV. Successful psychosocial aging is possible in older HIV-infected individuals. Positive psychological traits such as resilience, optimism, and sense of personal mastery have stronger relationship with SRSA than duration or severity of HIV disease. Research on interventions to enhance these positive traits in older HIV-infected adults is warranted.

- **Rueda S, Law S, Rourke SB. [Psychosocial, mental health, and behavioral issues of aging with HIV.](#) *Curr Opin HIV AIDS.* 2014 Jul;9(4):325-31.**

This review conveys the psychosocial challenges that older adults living with HIV face. Older people with HIV are more likely to experience neurocognitive impairment and mental health issues than their HIV-uninfected counterparts. In addition, social isolation is experienced more often as a result of decreased social participation and engagement. This field of research is evolving and many research gaps are to be addressed, including a better conceptualization and measurement of successful aging and the development of high-quality integrated care, programs, and services tailored to the needs of older people with HIV.

- **Wendelken LA, Valcour V. [Impact of HIV and aging on neuropsychological function](#). J Neurovirol. 2012 Aug;18(4):256-63.**

HIV-infected individuals are aging in large numbers, with estimates that more than half are now over the age of 50. Despite successes in treatment including viral control that maintains immune health, a sizeable number of patients in this age group suffer from HIV-associated neurocognitive disorders (HAND). Patients with HAND report cognitive deficits such as memory loss, easy distraction, mood swings, and learning difficulties. Other associated problems include depression, balance disorders, and decreased manual dexterity. Several studies suggest the difficulty in diagnosis and treatment is attributable to the similarity of symptoms seen in dementia, Alzheimer disease, and Parkinson disease. Distinguishing which diagnosis is responsible for the symptoms often is not achievable, thus complicating the recommendation for appropriate treatment. Neuropsychological testing performance is clouded by overlap of HIV effects and normal aging effect. This article includes a useful Table 2 in which the findings of several studies of neuropsychological testing are summarized. There also is a discussion of the distinguishing factors such as delayed HIV diagnosis, prolonged high viremia, low CD4 counts for prolonged periods, and comorbid conditions that may facilitate the interpretation of neuropsychological testing. The expectation that PLWHA will live into the eighth decade of life amplifies the importance of developing strategies to optimize cognitive health and assist with accurate diagnosis in order to provide appropriate treatment. The authors suggest further research in this area.

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