Innovative models of care supporting people aging with HIV

Richard Dunville[a] *and Meredith Greene*[b]

Purpose of review
As the population of people living with HIV ages, the integration of geriatric principles into HIV care is increasingly important. This review synthesizes innovative care models, evidence-informed strategies, and emerging practices designed to address the unique needs of people aging with HIV.

Recent findings
People aging with HIV face an accelerated onset of age-related conditions, frailty, and multimorbidity due to a combination of factors, including chronic systemic inflammation, medication toxicities, and disparities in care. Emerging models of care integrate HIV and geriatric services, demonstrating promising outcomes in patient satisfaction, health improvements, and care team collaboration. Additionally, recently funded demonstration projects expand screening, case management, and holistic care delivery for older adults with HIV in new ways.

Summary
Although randomized controlled trials are limited, evidence-informed and emerging strategies show potential to improve outcomes for people aging with HIV. By combining geriatric and HIV care, addressing multimorbidity, incorporating additional specialties and care providers, and prioritizing patient-centered approaches, these innovative strategies lay the foundation for advancing health and enhancing the quality of life for this growing population.

Keywords
geriatric care, HIV and aging, holistic care, integrated care models, multimorbidity

INTRODUCTION

Advancements in HIV care, particularly the widespread use of antiretroviral therapy (ART), have transformed HIV from a fatal illness into a chronic condition. People living with HIV who receive early diagnosis and consistent treatment now often achieve lifespans comparable to those without the virus [1]. Thus, recent years in high-income countries have seen a shift in demographics, with roughly half of individuals living with HIV in the United States, the United Kingdom, and Europe now 50 years of age and older [2]. Comprehensive care models addressing aging-related comorbidities and mental health further enhance quality of life, ensuring long-term health and well being [1]. This article describes the emerging clinical interventions that hold promise to better integrate geriatric care and HIV treatment.

BACKGROUND

People aging with HIV face unique care considerations and challenges in receiving comprehensive care [3]. Initial HIV infection has been associated with epigenetic aging, such as genomic methylation changes and telomere shortening, compared to uninfected individuals with the same chronological age [4]. When poorly controlled, the chronic, low-grade inflammation associated with immune response to the HIV virus may further accelerate aging [5]. Even with viral suppression, persistent systemic inflammation and immune activation contribute to the accelerated onset of age-related conditions [4]. ART toxicities further exacerbate these risks, increasing the likelihood of multimorbidity and polypharmacy, while disparities in treatment access may deepen inequities in care.

[a]Department of Public Health, NORC at the University of Chicago, Atlanta, Georgia and [b]Division of General Internal Medicine & Geriatrics, Indiana University School of Medicine, Indianapolis, Indiana, USA

Correspondence to Richard Dunville, MPH, NORC at the University of Chicago, Public Health Department, 675 Ponce de Leon NE, Suite 8500, Atlanta, GA 30308, USA. Tel: +1 404 240 8400;
e-mail: dunville-rich@norc.org

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KEY POINTS

- People with HIV are increasingly older, and HIV care needs to evolve to include principles from geriatrics.
- Because the field of geriatric HIV is new, there is a paucity of evidence for care transformation and clinical outcome improvement.
- Numerous care models are currently being piloted and show early potential, and disseminating their evaluation findings will be critical for the field.

Frailty and geriatric syndromes are major concerns, as people with HIV often experience aging-related conditions earlier than their HIV-negative peers [6]. This population faces higher rates of falls, cognitive decline, and functional impairment, concurrent with higher rates of depression, necessitating earlier and more aggressive interventions [7]. Addressing these challenges requires a shift toward holistic, patient-centered care that integrates HIV treatment with chronic disease management, mental health services, and social support systems for loneliness and isolation to ensure sustained health and quality of life as they age [8]. New approaches can take the form of adapting general geriatric frameworks, such as the 'Matters, Medication, Mentation, Mobility, and Multimorbidity' Framework, more commonly known by its mnemonic '5Ms' [9]. The 5Ms hold promise for cognitive health, physical function, and individualized goals, especially for women [10]. Ensuring long-term health outcomes will depend on evolving care frameworks that prioritize early intervention, coordinated care, and equitable access to comprehensive healthcare services.

ASSESSING THE EVIDENCE

Ensuring the proper care for people aging with HIV requires a review of documented clinical advancements. Fortunately, numerous approaches exist to categorize the clinical evidence. The US Centers for Disease Control and Prevention offers a guide to systematically assess clinical evidence [11], and the US Health Resources and Services Administration (HRSA) HIV/AIDS Bureau offers a framework for categorizing the available evidence using implementation science [12]. These guidances describe three means of categorizing programs based on their available evidence:

(1) Evidence-based interventions are defined as those with published findings from high-quality studies that show demonstrable impacts on care and treatment.
(2) Evidence-informed interventions may have published, positive impacts on care and treatment, but the evidence may not rise to the level of being evidence-based by CDC's definition.
(3) Emerging strategies include recent innovations with real-world validity that are often unavailable in peer-reviewed journals.

Currently, there are no evidence-based interventions specific to people aging with HIV, but there is a growing number of evidence-informed and emerging strategies that adapt evidence-based general geriatric interventions for this population. Therefore, this review includes program descriptions, preliminary findings, and early indications of intervention success from peer-reviewed and nonpeer-reviewed sources, such as conference proceedings, websites, and personal communication. Other criteria included implementation sites from the United States or Europe and results released within the last 10 years. A summary of included programs can be found in Table 1.

EVIDENCE-INFORMED STRATEGIES

The longstanding clinic in Chelsea and Westminster Hospital co-locates HIV providers with geriatricians and HIV-specialist pharmacists to serve clients over 50 years [13]. Using a comprehensive geriatric assessment (CGA) [14], the clinic assessed frailty, multimorbidity, and polypharmacy. Given the high prevalence of multimorbidity (46.6%) and polypharmacy (69.3%), the clinic created new HIV specialty clinics to expand their services and better manage comorbidities. A related study focusing on those 80 and older found 62% individuals were deprescribed medications, and 29% received modernized antiretrovirals [15▪▪].

The Golden Compass Program at the HRSA Ryan White-funded Ward 86 Program in San Francisco offers integrated geriatric and HIV services, with geriatric services co-located within the HIV clinic, medication reviews, geriatric screenings, and social support classes to 198 people 50 years and older beginning in 2017 [16]. The services were developed with community and provider input and modeled after the quadrants of a compass and included on-site services for cardiology and cognitive function; exercise and on-site consultations for bone health, physical fitness, and functional movement; dental, audiology, and eye health services; and social connections and community engagement. Evaluation components included a patient survey and interviews with patients and providers. Patients rated overall care satisfaction at 97%, with equally high ratings for each care component. Self-rated health

Table 1. Evidence-informed and emerging strategies to support people aging with HIV

Program name	Type of strategy	Co-location of HIV and geriatric services	Expanded screenings	Individualized care plans	Incorporation of CHWs, allied health professionals, and patient liaisons	Promotion of social connections	Medication review	Provider training[a]
Chelsea and Westminster Clinic	Evidence-informed	✓	✓	✓	✓	✓	✓	✓
Golden Compass	Evidence-informed	✓	✓	✓	✓	✓	✓	
Silver Clinic	Evidence-informed	✓	✓	✓	✓		✓	
Sunflower Clinic	Evidence-informed	✓	✓	✓	✓			
HIV and Aging Program	Evidence-informed	✓	✓	✓		✓		
New York State Pilot Programs[b]	Emerging	✓	✓	✓	✓	✓	✓	✓
HIVE Clinic	Emerging	✓	✓	✓			✓	
Premier Platinum Program	Emerging	✓	✓	✓	✓	✓	✓	
HIV Dementia Champions Program	Emerging		✓					✓
iCHANGE	Emerging	✓	✓	✓	✓			
E&E Program	Emerging	✓	✓	✓	✓	✓		
I^2C^2	Emerging	✓	✓	✓	✓	✓		
Comprehensive Program to Integrate Care for Older Adults with HIV	Emerging				✓			
Improving the 6Ms	Emerging	✓	✓	✓	✓	✓	✓	✓
Wake Forest Infectious Disease Specialty Clinic	Emerging	✓	✓	✓				
Yale University 4F Model	Emerging	✓	✓	✓	✓		✓	✓

[a]Many interventions offered training to providers on the new services, workflows, and so forth. This category refers to provider training that was an explicit intervention approach.
[b]The pilots are presented collectively, although each pilot offered a unique approach.

also increased following the clinic visits. Patients and providers reported high program satisfaction.

The Silver Clinic of Brighton was developed in 2016 by the Brighton and Sussex University Hospitals NHS Trust to support people living with HIV through a referral process that resulted in individual care plans [17▪], guided by the 5Ms [9]. The care team integrated HIV and geriatric specialists with an HIV pharmacist. Any HIV provider could refer a patient presenting with complex comorbidities, polypharmacy, or aging-related syndromes for a clinical visit that included a review of physical health and assessments for anxiety, depression, frailty, and quality of life. The resulting individualized care plan included referrals to the appropriate specialists, general practitioners, or social services. An initial evaluation indicated that half of patients referred were experiencing a geriatric syndrome, and screening resulted in additional referrals, medication adjustments, and patient education [18]. Both patients and care providers reported high levels of satisfaction (93 and 63%, respectively). A randomized controlled trial completed enrollment in October 2023, the results of which will provide the most robust evidence to date on integration of HIV care and geriatrics [19].

Since 2016, the Sunflower Clinic has supported the unique needs of women of all ages living with HIV served by the Brighton and Sussex University Hospitals NHS Trust with screenings and services informed by community input [20]. The multidisciplinary Sunflower care team integrates HIV physicians and nurses with women's health specialists, such as reproductive health physicians, a women's health advisor, and a women's social worker. A typical clinic visit incorporates a 'one-stop-shop' for women's health needs, including aging-related concerns, such as bone density scans, cardiovascular exams, sexual health services, education on menopause, and assessments for domestic violence, social health, and mental health. The records of 50 participants were compared to those of 50 women in the routine HIV clinic, and the results showed that the Sunflower clinic improved assessments for domestic violence, mental health, cytology, and sexual health, including contraception.

The HIV and Aging program of the Center for Special Studies (CSS) began in 2015 at the Weill Cornell campus of the New York Presbyterian Hospital [21]. Primary care physicians, other staff, or patients could request a referral for a CGA. The CGA included a basic history and physical exam and a battery of assessments that were preprogrammed in the electronic medical record. Some notable assessments included the PHQ-4 for mental health, Montreal Cognitive Assessment (MoCA),

and Gérontopôle frailty screen. The geriatricians performing the CGA also asked questions about activities of daily living, pain, hearing, vision, and falls. Of the 105 patient records that were reviewed, 40% struggled with at least one instrumental activity of daily living, with the same number experiencing possible mild cognitive impairment. Patients also expressed challenges with community support. Following the CGA, the geriatrician presented the case to the CSS interdisciplinary care team and developed a care plan. However, it should be noted that an evaluation found few of its recommendations were followed [22]. The program no longer offers co-located services and has evolved into a geriatric consultation service (Eugenia Siegler, MD, 10 February 2025, personal communication).

EMERGING STRATEGIES

Much of the interventions in this field could be considering emerging strategies based on available evidence, but numerous efforts are underway to evaluate the emerging strategies and translate those findings into tools for the field.

NEW YORK STATE PILOT PROGRAMS

Within the US state of New York, 638 patients across 13 sites participated in a pilot project to enhance screening for vision, hearing, and memory impairments [23▪▪]. Sites used a modified WHO Integrated Care for Older People (ICOPE) framework screening tool [24]. Of the screening assessments, hearing loss was the most frequent referral at 27%. Positive screens did not always result in a referral, as the patient may have already been receiving care for that issue, there were no services available for referral, or the patient declined a referral. All sites have modified their standard of care to include the screenings, even though the pilot concluded. New York State is also funding a 5-year large scale pilot program for people aging with HIV. Unique to this approach, programs are located in each region of the state and include both healthcare and community-based sites. Each site has adopted a unique program based on their client needs and the services they offer [25]. Program approaches included expanded ICOPE screening [24], which focuses on maintaining and improving intrinsic capacity and functional ability with patient input. All referrals are supported with case management services.

STRONG DEMONSTRATION PROJECT

The 'Strengthening Therapeutic Resources for Older patients Aging with HIV' (STRONG) project in Baltimore, Maryland, USA was developed by the University of Maryland School of Medicine with input from community members and providers [26]. Patients received screening for physical and mental health, quality of life, and cognition, along with medication reviews and assessments for aging-related conditions. Facilitators of implementation include patient and provider input, while challenges include resource constraints affecting sustainability.

HEALTH RESOURCES AND SERVICES ADMINISTRATION'S HIV/AIDS BUREAU-FUNDED EMERGING STRATEGIES

In 2022, HRSA's HIV/AIDS Bureau (HAB) Special Projects of National Significance (SPNS) Program funded 10 demonstration sites, a capacity building provider, and an evaluation provider to implement and test emerging strategies to support HRSA HAB Ryan White Program clients with HIV aged 50 years and older. The selection of strategies was site-driven, and community participation was encouraged in all stages of the projects. Implementation concluded in August 2024, and preliminary findings have been presented in initiative-focused meetings and made publicly available [27▪]. Full evaluation results, including client-level outcomes are expected in 2025 [28]. An overview of the 10 demonstration projects is provided here.

Boston Medical Center implemented a referral-based, combined geriatric and infectious disease clinic called the HIV Elders (HIVE) clinic. HIVE focused on comprehensively screening and managing comorbidities, geriatric conditions, behavioral health, and psychosocial needs through four strategies: creating a referral workflow, completing a CGA and individualized care plans, reviewing medications, and initiating and documenting advanced care planning decisions.

Centro Ararat, Inc. of Ponce, Puerto Rico developed the Premier Platinum Program (PPP) by integrating geriatric, mental, and neuropsychological health services in a single site to expand screening and management of comorbidities and provide supportive health services. On a referral basis, clients of PPP could see a geriatrician, receive a neurological assessment, and have a medication review. Referrals and follow-up were overseen by two medical case managers and social workers.

The University of Chicago created the HIV Dementia Champions Training Program to expand dementia assessment and management capacity within its HIV specialty care clinics. The trained champions provide screening, support, and referrals to memory care services within the University of

Chicago network to older adults with HIV and dementia and their caregivers.

Colorado Health Network (CHN) designed the Integrated Care for Healthy Aging and Navigation of Geriatric Effects (iCHANGE) Project to expand, refine, and evaluate CHN's prior HealthWell (Healthy Aging and Wellness) model to support clients aging with HIV. The added services help reduce risk for cognitive and functional impairment through increased physical, social, and nutritional services.

Empower U, Inc., a community health center, expanded their existing one-stop-shop for their older clients with HIV with the E&E Program: Educating and Empowering People Aging with HIV. This program incorporates additional screenings and on-site services, including dental services, nutritional services, social support groups, and cognitive support services.

Family Health Centers of San Diego established their 'Intensive Individualized Care Coordination to Enhance Health and Quality of Life for HIV-Positive Older Adults in San Diego, CA' (I^2C^2) program to screen for and manage HIV and aging-related conditions, such as heart disease, diabetes, substance abuse, alcohol dependency, stigma, and social isolation.

Mount Sinai Beth Israel added a Community Health Worker (CHW) to their geriatric assessments called the 'Comprehensive Program to Integrate Care for Older Adults with HIV'. Based on the 5Ms, the CHW helps patients navigate the healthcare system and community services, ensures the programs meets patient needs, and realigns team members roles to optimize their efforts.

The University of Pittsburgh Medical Center Presbyterian Shadyside (UPMC Shadyside) featured the 'Improving the 6Ms at Pittsburgh Area Center for Treatment' or IMPACT model to promote provider training, patient screening, and improve clinical workflows with the addition of a geriatric consultant in their clinic. IMPACT incorporated the medication review with support from an on-site pharmacist and trainees. Concurrently, UPMC Shadyside expanded their partnerships with the Area Council on Aging to promote IMPACT and increase program linkages to better support clients.

Wake Forest Infectious Disease Specialty Clinic (IDSC) made use of a cumulative deficit score in their electronic medical record. Based on the Rockwood model, the score is calculated based on total deficits, such as hospitalizations, labs, and total diagnoses, rather than clinical criteria like weight loss or slow walking speed [29]. The clinical staff review the score to determine if patients may need additional frailty assessments or referral for other services. IDSC also expanded partnerships with aging-related service providers to characterize and mitigate frailty and prefrailty.

Yale University relied upon the 4F model (Falls, Fragility, Fracture, and Polypharmacy) to create a collaborative care model at Yale HIV clinics that uses a CGA tool. Clients are assessed during the annual visit, and those with moderate to high scores are referred for care coordination and additional assessment. Yale also trained clinical staff in the management of age-related conditions and health disparities, focusing on aspects of the 4Fs.

URBAN-FOCUSED AND RURAL-FOCUSED EMERGING STRATEGIES

The US Department of Health and Human Services recently announced the recipients of two national challenges to address the needs of people aging with HIV. For the first phase, 20 community-based organizations in urban and rural areas received $15 000 to develop community-driven solutions to support people aging with HIV in their communities [30▪]. The selected programs focus on a wide array of needs, including strategies to support nutrition, social isolation, and caregiver support, particularly among racial and ethnic minorities. For the second phase, 10 of the phase 1 organizations received $70 000 to further develop and test their strategies [31▪]. Future research will report on the activities as implemented, as well as the results of these interventions. This work will further build the evidence base, particularly for community-led and community-driven supports.

FUTURE RESEARCH

As an emerging field, additional research is needed to expand the current evidence base through disseminating the findings from current and recently completed pilot and demonstration projects, including updated findings from long-standing clinics.

CONCLUSION

The average age of people with HIV is increasing, requiring HIV care to incorporate a geriatric lens. Although several geriatric frameworks, there is little evidence regarding the outcomes of their implementation within a HIV care setting. Fortunately, there are numerous evidence-informed and emerging strategies currently being tested, and many of these strategies involve co-location of geriatric services within an HIV clinic, expanded assessments for geriatric conditions, and polypharmacy reviews. The results of their evaluations, both for

implementation factors and resulting health outcomes, will greatly advance the evidence in this field.

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Conflicts of interest

There are no conflicts of interest.

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