

## ORIGINAL RESEARCH

# What problems associated with ageing are seen in a specialist service for older people living with HIV?

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## Abstract

**Objectives:** By 2030 the majority of the people living with HIV in the United Kingdom will be over the age of 50. HIV services globally must adapt to manage people living with HIV as they age. Currently these services are often designed based on data from the wider population or from the experiences of HIV clinicians. This article aims to help clinicians designing inclusive HIV services by presenting the most common needs identified during the first year of a specialist clinic for older people living with HIV at the Ian Charleson Day Centre, Royal Free Hospital in London, United Kingdom.

**Methods:** The records of all thirty-five patients attending the inaugural nine sessions were reviewed.

**Results:** The median age of attendees was 69 (53–93) with 77% being male, 63% being White, 49% being heterosexual and 97% being virally suppressed respectively. The majority (83%) met the criteria for frailty using the Fried frailty phenotype. Eighteen issues linked to ageing were identified with the most common being affective symptoms (51%), memory loss (37%) and falls (29%).

**Conclusions:** Whilst older people living with HIV are a heterogeneous group frailty is common and appears to present earlier. HIV services either need to adapt to meet these additional needs or must support users in transitioning to existing services. We feel that our multidisciplinary model is successful in identifying problems associated with ageing in people living with HIV and could be successfully replicated elsewhere.

## KEYWORDS

ageing, cognitive impairment, depression, falls, frailty, HIV, sarcopenia

## INTRODUCTION

Ageing is at the forefront of current health policy, with the United Nations branding 2020–2030 the ‘decade of healthy ageing’ [1]. Conventional ageing research considers older people to be over the age of over 65; however, in

HIV research, age > 50 years classes you as older due to the precedent set by the US Centers for Disease Control’s original age stratification of HIV/AIDS [2]. Data from 2018 showed that in the UK 39% of those accessing HIV services were over the age of 50, which consisted of people ageing with HIV as well as those who were diagnosed at

an older age, and it is expected that by 2030 this will increase to 70% [3–5].

Ageing is associated with increased rates of frailty in both the general population and the HIV population as is, defined as ‘a condition in which a person has reduced homeostatic reserves resulting in increased vulnerability to both endogenous and exogenous stressors leading to them being at increased risk of negative outcomes’ [6,7]. Frailty is associated with increased rates of multi-morbidity, disability, long-term residential care placement, hospitalization and death and can present earlier in those living with HIV [8,9]. Frailty can be assessed for and managed by undertaking what is known in geriatric medicine as a ‘comprehensive geriatric assessment’ (CGA), which is a multidisciplinary assessment that covers domains including physical, psychological, functional and social abilities and has been shown to improve outcomes for older people [10].

Currently there is no gold standard model for managing people living with HIV as they age. Several models have been proposed internationally including joint HIV and geriatric medicine clinics such as the ‘Silver Clinic’ in Brighton, UK, and the ‘Golden Compass Programme’ in San Francisco, US [11,12]. As many HIV physicians may be unfamiliar with frailty, while geriatricians lack experience of HIV, joint services such as these may allow for more holistic care.

This paper explores our experience in establishing a specialist service for older people living with HIV as well as describing the main aspects of ageing with HIV identified in our cohort in the inaugural year.

## MATERIALS AND METHODS

The Ian Charleson Day Centre (ICDC) was established at the Royal Free Hospital in 1990 as the first open-access clinic for people with HIV in the UK and currently coordinates the care of 3200 people, just over half of whom are older than 50. Many service users were presenting with problems related to ageing, so a dedicated monthly multidisciplinary clinic, ‘The Sage Clinic’ (non-acronymous), was formed with the aim of identifying and managing these problems.

### Clinic design

The monthly 4-h multidisciplinary clinic allowed for six patients to be seen in a carousel format made up of three 30-min assessments, with each patient assessed for 90 min in total. The multidisciplinary team (MDT) consisted of the following members: HIV physician, geriatrician, physiotherapist, occupational therapist, HIV specialist

### Practitioner Points

1. Frailty in common and can present earlier in people living with HIV.
2. Prevalent features of ageing in people living with HIV includes depression, cognitive impairment, polypharmacy and falls.
3. A multidisciplinary model is successful in identifying and managing problems associated with ageing in older people living with HIV.

pharmacist and HIV specialist nurse. Dietetics, speech and language therapy, psychology and social work professionals were not available to attend and were referred onto as needed.

Prior to the clinic the referral and patients’ existing medical records were reviewed to formulate a summary highlighting potential issues including possible barriers to engagement or interventions. The first of the three assessments comprised a medical review led by a geriatrician focusing on the physical and psychological domains of the CGA [10]. The assessment was performed alongside a consultant HIV physician to provide a point of reference to the relevance of an HIV diagnosis and to ensure that there were no contraindications for any suggestions. The functional and social domains of the CGA were explored by a physiotherapist and occupational therapist who reviewed mobility and function while providing patient education, onward referral to therapy or social services and delivery of equipment. The final part of the CGA included a medication review by a HIV specialist pharmacist to evaluate concordance, tolerability and drug–drug interactions. Prior to the clinic patients were sent questionnaires to ascertain information to help guide the reviews; as these were often not completed, the final part of this session involved a HIV specialist nurse assisting with this.

At each stage attendees were provided with a summary of the professionals’ findings and suggestions and were invited to ask any questions. The MDT reconvened at the end of the clinic to construct an MDT report summarizing their findings, providing information on how best to support the patient who was then sent to the referring HIV clinician plus the primary care physician when permitted.

### Patient identification

Table 1 demonstrates the referral criteria for the Sage Clinic with patients identified by their regular HIV clinician or HIV specialist nurse [13].

## Objective outcome measures

The outcome measures collected during the Sage Clinic are summarized in Table 2.

The Fried Frailty Phenotype assesses five criteria (weight loss, exhaustion, low physical activity, slowness and weakness) to determine the degree of frailty, with a score of 0 indicating a person as robust, 1–2 as pre-frail and 3 or more as frail [13]. Table 2 illustrates the adapted version used within our service using subjective questions rather than the objective measures required in traditional Fried scoring to facilitate ease of use [13].

Fried scoring is limited as it does not account for the psychological or neurocognitive aspects of frailty so depression was screened for using the Patient Health Questionnaire-9 (PHQ-9), a nine question tool where a score of 10 or more is suggestive of depression (range 0–27) [14,15]. Anxiety was assessed for using the General Anxiety Disorder-7 (GAD-7) tool comprising seven questions again where a score of 10 or more is diagnostic (range 0–21) [16]. Cognitive screening

was performed using the Montreal Cognitive Assessment (MoCA), a one-page 30-point test of seven domains where a score of 26 or more is considered normal [17].

Quality of life (QOL) was assessed using the World Health Organization Quality of Life-HIV BREF (WHOQOL-HIV-BREF) which comprises thirty-one questions on the patient's perceptions of their well-being over the preceding 2 weeks [18]. Responses are given via a 1–5 Likert scale where 1 represents 'disagree' or 'not at all' and 5 represents 'completely agree' or 'extremely' [18]. Questions cover six domains: physical, psychological, level of independence, social, environmental and spiritual [18]. Finally, disability was assessed using the World Health Organization Disability Assessment Schedule (WHODAS 2.0), a 36-question tool which covers six areas: cognition, mobility, self-care, getting along, life activities and participation, using a 1–5 Likert scale, with 1 representing 'none' and 5 'extreme or cannot do' [19].

**TABLE 1** Referral criteria for the Sage Clinic – one or more required

Multiple medical comorbidities (one or more) in addition to HIV
Complex polypharmacy issues (five or more medications excluding those to manage HIV)
Reduced/impaired mobility or reduced muscle strength
More than one fall in the previous 6 months
Inability to maintain activities of daily living
Underweight/unintentional weight loss
Memory problems
Advance care planning

## Costings

HIV clinician, pharmacist and nursing time was provided directly from within the existing HIV departmental budget. The time of the geriatrician, physiotherapist and occupational therapist was paid for on a sessional basis, supported by an external grant.

## Statistical analysis

Data were summarized using descriptive statistics including frequency, median or with corresponding percentages or interquartile ranges.

**TABLE 2** Patient-reported outcome measures collected and the adapted Fried frailty criteria used by the Sage Clinic [13]

Frailty assessment	Local adapted version of the Fried Frailty Score [13] In the last 12 months have you noticed any of the following?
	1. Inability to grip with hands (e.g. opening a jam jar) <input type="checkbox"/> Yes (1) <input type="checkbox"/> No (0)
	2. Unexpected decrease (loss) of weight that's worrying you <input type="checkbox"/> Yes (1) <input type="checkbox"/> No (0)
	3. A slower walking pace than usual <input type="checkbox"/> Yes (1) <input type="checkbox"/> No (0)
	4. Not feeling full of energy most days of the week <input type="checkbox"/> Yes (1) <input type="checkbox"/> No (0)
	5. Being less or much less active compared with someone who spends 2 h on most days on activities such as walking, gardening, household chores or do-it-yourself projects <input type="checkbox"/> Yes (1) <input type="checkbox"/> No (0)
	Total frailty score: _____
Screen for depression	Patient Health Questionnaire-9 (PHQ-9) [15]
Screen for anxiety	General Anxiety Disorder-7 (GAD-7) [16]
Cognitive assessment	Montreal Cognitive Assessment (MoCA) [17]
Quality of life assessment	World Health Organization Quality of Life-HIV BREF (WHOQOL-HIV-BREF) [18]
Disability assessment	World Health Organization Disability Assessment Schedule (WHODAS 2.0) [19]

## RESULTS

The records of the 35 attendees (nine clinics) were reviewed for demographics and the issues identified and addressed within the appointments.

### Demographics

The median age of attendees was 69 years, with a preponderance of white men who have sex with men. Most patients had well-controlled chronic HIV, with 97% being virally suppressed. Full demographics including HIV markers and antiretroviral therapy (ART) regimes are outlined in Table 3.

### Issues identified during the consultations

Eighteen discreet issues related to ageing with HIV were identified with a median of three per person (range 1–7) with the full list and frequency outlined in Table 4.

**TABLE 3** Baseline demographic and clinical characteristics of people seen in the Sage Clinic

Clinical characteristics ( <i>n</i> = 35)	Results
Age (years) [median (range)]	69 (53–93)
Male [ <i>n</i> (%)]	27 (77)
White ethnicity [ <i>n</i> (%)]	22 (63)
Identified sexuality [ <i>n</i> (%)]	MSM: 18 (51) Heterosexual: 17 (49)
Time since HIV diagnosis (years) [median (range)]	22 (3–37)
Duration of ART (years) [median (range)]	21 (3–32)
Current ART-based regimen [ <i>n</i> (%)]	NRTI: 29 (83) NNRTI: 8 (23) PI: 11 (31) INI: 21 (60) CCR5 antagonist: 2 (6)
HIV RNA < 40 copies/mL [ <i>n</i> (%)]	34 (97)
Nadir CD4 (cells/ $\mu$ L) [median (IQR)]	74 (182)
Current CD4 (cells/ $\mu$ L) [median (IQR)]	477 (319)
CD4:CD8 ratio [median (IQR)]	0.8 (0.8)
Previous AIDS-defining condition [ <i>n</i> (%)]	21 (60)

Abbreviations: ART, antiretroviral therapy; CCR5, C-C chemokine receptor type 5; INI, integrase inhibitor; IQR, interquartile range; MSM, men who have sex with men; NNRTI, nonnucleoside reverse transcriptase inhibitors; NRTI, nucleoside/nucleotide reverse transcriptase inhibitors; PI, protease inhibitors.

Depression was the most common problem reported by over half of the sample (51%). Other common issues included memory problems (37%), falls (29%) and unexplained weight loss (20%). Polypharmacy (classified as five or more medications excluding ART) was present in 24 cases (69%) but only modifiable in three (9%).

Problems not directly related to ageing were also identified, such as smoking, alcohol use disorder, financial insecurity and immigration issues, but these are relevant as they can cause physical or psychological morbidity leading to frailty.

### Objective outcome measures

Thirty (86%) patients engaged with frailty scoring (Figure 1) with the majority (83%) being identified as frail, 10% as pre-frail and only 7% assessed as being robust (range 0–5).

Thirty-one (89%) attendees completed the PHQ-9 assessment with a median score of 11 [interquartile range (IQR): 11], and is consistent with the qualitative findings where approximately half of attendees reported feeling depressed. The GAD-7 assessment was completed by 30

**TABLE 4** Issues identified during assessment of patients in the Sage Clinic

Issue	Number of patients ( <i>n</i> = 35)	Percentage of patients (%)
Affective symptoms and depression	18	51
Memory loss	13	37
Falls	10	29
Urinary symptoms	9	26
Pain	8	23
Weight loss	7	20
Breathlessness	5	14
Bowel symptoms	5	14
Haematological problems	5	14
Anxiety	4	11
Isolation and loneliness	4	11
Alcohol use disorder	3	9
Modifiable polypharmacy	3	9
Financial insecurity	2	6
Smoking	2	6
Complications of diabetes mellitus	2	6
Visual symptoms and loss	1	3
Immigration issues	1	3

(86%) patients with a median score of 6 (IQR: 7), illustrating that this was less prevalent than depression and again mirroring the subjective results. Seventeen people met the criteria for depression and eight for GAD, respectively.

Cognitive screening was performed for the first seven patients but was often impacted by the presence of affective symptoms which prevented engagement, and patients reported they found it tiring. It often took half of the consultation with the geriatrician to complete the MoCA, resulting in less time to explore more dominant problems. The MDT discussed this unforeseen challenge and subsequently a MoCA was only completed if memory loss was a predominant symptom. A total of eight (23%) were completed with a median score of 21 (IQR: 11). Six people had results suggesting cognitive impairment.

The WHOQOL-HIV-BREF was completed by 30 (86%) attendees, demonstrating worse QOL across the physical, psychological, level of independence and social domains (Table 5) when compared with results from previously

described cohorts [18,20,21]. Twenty-six (74%) patients completed the WHODAS 2.0 assessment with a median score of 36 (IQR 32), approximately correlating to the 90% population percentile demonstrating a high level of disability within the cohort [19].

## DISCUSSION

All patients reported issues related to ageing with HIV regardless of their Fried score, highlighting that lower frailty scores do not always equate to uncomplicated ageing. Frailty was prominent in our sample, with 83% classified as frail and a further 10% as pre-frail. Our sample is small and preselected and it is likely that we were referred those who were considered most symptomatic by their HIV clinicians, thus explaining why the prevalence is so high, although the full spectrum of Fried scores (0–5) was seen. As a result of our sampling, our results cannot be extrapolated to estimate the frailty rate among older people living with HIV in the wider UK population. For reference the prevalence of frailty in the UK in a sample of approximately half a million people aged 37–73 years was 3% [22]. Frailty in our sample was diagnosed using a bespoke adaptation of the Fried score using exclusively self-reported information potentially limiting results. Secondary analysis of data from the Irish Longitudinal Study on Ageing (TILDA) ( $n = 4961$ ) showed that the characteristics of frailty are similar regardless of whether solely self-reported or objective measures are used [23]. With regard to people living with HIV, a recent study ( $n = 80$ ) found similar rates of frailty when comparing an objective assessment utilizing gait speed (19%) with a subjective assessment utilizing a self-reported health questionnaire (20%) [24]. The prevalence in our study is higher than data from an Australian study which reported 28% and results from a service for older people living with HIV in Brighton, UK, which reported a prevalence of 65% [11,15]. These factors

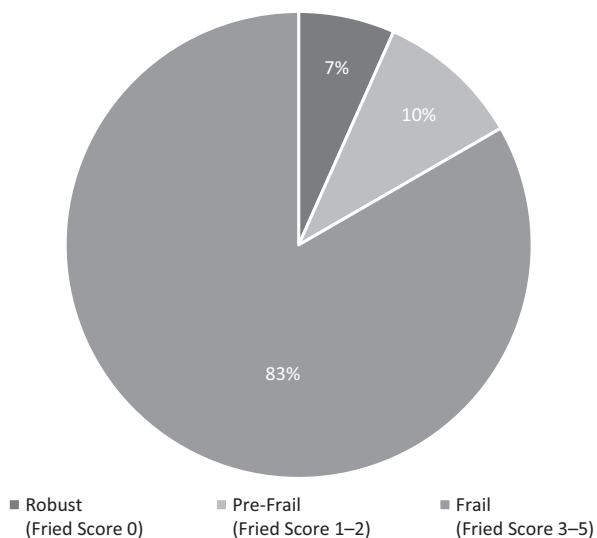


FIGURE 1 Distribution of Fried Frailty Scores

TABLE 5 Results of World Health Organization Quality of Life-HIV BREF (WHOQOL-HIV-BREF) domains in the Sage Clinic compared with previous studies [20,21]

WHOQOL-HIV-BREF domain	Sage clinic Mean (SD)	Pereira et al. (2014) <sup>a</sup> Mean (SD)	Meemon et al. (2016) <sup>b</sup> Mean (SD)
Physical	12.34 (3.79)	13.48 (1.17)	14.48 (2.68)
Psychological	12.47 (3.05)	16.56 (1.01)	14.99 (2.48)
Level of independence	11.15 (3.75)	13.72 (1.08)	13.35 (2.39)
Social	12.77 (3.10)	13.34 (1.01)	13.32 (2.76)
Environmental	13.95 (2.81)	25.97 (0.96)	13.91 (2.21)
Spiritual	14.24 (3.67)	13.20 (1.28)	14.90 (3.42)

<sup>a</sup>Portugal:  $n = 185$ ; mean age = 57.84 (6.79) years; mean CD4 count = 433.06 (275.65); mean years since diagnosis = 6.34 (5.20) years.

<sup>b</sup>Thailand:  $n = 329$ ; mean age = 41.95 (7.82) years; mean CD4 count = 489.51 (249.35); mean years since diagnosis = 10.40 (6.04) years.

emphasize that the method of defining and identifying frailty impacts the results of prevalence.

The reported low QOL and higher proportion of disability within our sample are similar to results found in previous studies [20,21,25,26]. Pereira et al. (2014) used the WHOQOL-HIV-BREF to determine the QOL in a Portuguese sample of 185 people while Meemon et al. (2016) did the same in a Thai sample of 329 participants [20,21]. Both samples were younger than ours (mean ages 58 and 42, respectively) and had also lived with HIV for less time (6.34 and 10.40 years, respectively) which may explain our cohort scoring lower across the physical, psychological, level of independence and social domains [18,20,21]. The UK and Portugal are high-income countries but there was a large discrepancy in the environmental domain (13.95 vs. 25.97), suggesting that our cohort are less satisfied with their living conditions, more comparable to Thailand (13.91) [20,21]. This could be the case, as our sample came from one site while the Portuguese sample was recruited from 10, although it may also demonstrate the impact of older age and a prolonged time living with HIV, suggesting that an earlier year of diagnosis may still be impacting a person's environment and therefore QOL [20,21].

Socioeconomic factors such as poverty rates have been shown to impact rates of frailty directly [27]. The 2017 UK national HIV patient survey, 'Positive Voices', found that financial insecurity was common, with 46% of women and 32% of men with HIV living at or below the poverty line (annual household income < £20 000), and 68% of women and 44% of men with HIV not always having enough money to meet their basic needs [28]. British governmental data demonstrate higher rates of poverty, particularly in the context of older people, in urban areas such as London than in rural regions [29]. Migrants are also more likely to be frail, a finding not fully accounted for by confounding factors, highlighting the importance of enquiring about immigration issues [30]. Although not highly prevalent in our cohort, these factors may be contributing to our sample's frailty rate, supporting the idea that strategies for the management of frailty in older people living with HIV should be determined at the local level.

Our results also highlight the wide nature of ageing with HIV, with 18 different issues identified. Depression was common, with 51% of patients subjectively reporting affective symptoms supported by the median PHQ-9 score being 11, confirming a similar rate objectively. A high prevalence of depression in older people living with HIV has been reported previously, with a US study reporting a rate of 52% of participants ( $n = 1000$ ) feeling depressed within the last year [31]. However, ageing alone is unlikely to be responsible for this, so these results support

the recommendations of the British HIV Association (BHIVA) and European AIDS Clinical Society (EACS) to screen all patients, as our service does, for affective symptoms at least annually [32,33]. Just over a third (37%) of patients in our sample reported memory problems, with 63% of those who completed a MoCA ( $n = 8$ ) having an abnormal result. Cognitive impairment in older people living with HIV is commonly reported when the HIV-associated neurocognitive disorders (HAND) criteria are applied [34]. This shows that while our sample is small, our results corroborate previous studies, emphasizing the importance of enquiring about memory problems with services having clear local protocols for either in-house objective assessment or onward referral. Patients within our cohort with depression, anxiety or suspected cognitive impairment were managed by referrals to in-house peer support, psychology or liaison psychiatry services with a high rate of uptake by attendees.

Finally, 29% of the patients reported recurrent falls, which is similar to the findings of a US study ( $n = 155$ ) where 26% reported falling often [35]. Falls are well reported in the literature on geriatric medicine, with evidence recommending a multidisciplinary approach combining medical review with pharmacist-led medication review and therapy-led balance and strengthening exercises and appropriate walking aids [36–38]. Given the complications of HIV and its treatment, knowledge of ART as well as other medications was critical and the involvement of an HIV specialist pharmacist was invaluable in managing this problem. Polypharmacy was prevalent in the sample (69%) but in most cases was appropriate due to the multi-morbidity associated with ageing with HIV and was not modifiable [15,31]. Cases where medications could be withdrawn predominately involved long-term use of opioids and benzodiazepines. Use of these classes of medications has been shown to be both prevalent among older people living with HIV and linked to an increased risk of falling [11,39,40]. Medical and pharmacy reviews were performed alongside assessments by an experienced physiotherapist and occupational therapist who could provide brief interventions and refer on to appropriate community services. Given the high prevalence of falls in older people living with HIV this supports the use of our multidisciplinary model.

People living with HIV are two-thirds more likely to be current tobacco smokers despite smoking having been shown to significantly increase the risk of frailty [41,42]. Meanwhile, the prevalence of alcohol use disorders in people living with HIV is approximately 30%, with high usage associated with falls and cognitive decline, and a recent study linked chronic alcohol use to the development of frailty in people living with HIV [43–46]. Despite the low prevalence of smoking and alcohol use disorder within our cohort, it remains important to screen for these

due to their potential impact on ageing when assessing older people living with HIV.

Models of care for older people living with HIV vary worldwide. Management of ageing-related problems and frailty is becoming more central to the design and delivery of HIV services, with EACS emphasizing the importance of frailty screening and BHIVA promoting the incorporation of geriatricians into the care of complex older people living with HIV [32,33]. Similar models of care, incorporating geriatricians into HIV services to deliver CGA, have been discussed previously, but given our location and population we have achieved almost equivalent numbers of patients through the service in a considerably shorter time, as well as having greater variability in gender, race and sexual orientation, which can impact the presentation of frailty [11].

Feedback from attendees was predominately positive, with many happy to have had the opportunity to discuss issues not typically explored. Several highlighted the clinic being conducted within the HIV outpatient department as an incentive for them to attend, as they were fearful of mainstream services due to concerns about discrimination. This is not unexpected as a previous study identified that anticipated or experienced stigma was a key barrier to accessing healthcare services for people living with HIV, with 35% worrying that they would be treated differently, 14% having experienced discrimination and 11% having been denied or refused a treatment or procedure due to their HIV status [47]. The majority felt that the therapy and pharmacy reviews were useful, although some reported feeling that not all areas of the assessment were relevant to them and would have preferred to self-select which to undertake. Several of the patients, primarily those with affective or cognitive symptoms, struggled with the length of the appointment and reported that they would have preferred to have done them separately. The high burden of questionnaires was conveyed as a deterrent to attending.

During the COVID-19 pandemic the clinic was suspended due to staff reallocation and national recommendations to conduct appointments virtually where possible. Clinicians were advised to follow the referral procedures in place prior to the formation of the Sage Clinic such as referral to local outpatient or community therapy services, although discussion of complex cases with the relevant professionals was available throughout.

After our interim analysis we streamlined the service, removing the pre-clinic questionnaires, instead allowing the selection of appropriate tools to be chosen following clinical assessment and to be conducted on the day. We now also identify before the clinic those who would benefit from a full MDT assessment versus those who require only certain reviews, in order to prevent overwhelming attendees. Further information has been given to referrers to ensure patients are fully aware of what the clinic will entail,

but also to refer patients with pre-frailty. We have recommended screening for affective symptoms prior to referral, with those with high scores being referred to psychology in tandem to allow for a more meaningful patient experience. We also now offer shorter follow-up appointments to allow for the review of investigations and interventions.

To our knowledge our holistic multidisciplinary model incorporating nursing, therapy and pharmacy colleagues alongside physicians has not been described previously with regard to people living with HIV. We present these initial findings while we collect data around long-term outcomes and cost-effectiveness which will be published in future. Despite limitations, this is an evolving area with a paucity of evidence, and these early data can contribute to the discussion of how best to deliver services to older people living with HIV [48]. Our current recommendations would be that services start by ensuring they have a clear strategy in place for frailty screening to determine local prevalence, and have clear referral pathways to existing geriatric medicine and therapy services in place at this stage. Once local needs are established, a bespoke clinic can be considered, but as attendees may fear stigma or discrimination, we support welcoming external healthcare professionals into patients' existing space as the preferred model of care. We endorse an MDT approach, offering CGA with a particular focus on the geriatric medicine syndromes of cognitive impairment, depression, falls and polypharmacy [49].

## CONCLUSIONS

Although older people living with HIV are a heterogeneous group, frailty is common and appears to present earlier. Our data demonstrate a high prevalence of affective and cognitive symptoms within this cohort. HIV services either need to adapt to meet these additional needs or must support users in transitioning to existing services. We feel that our multidisciplinary model of incorporating geriatricians, HIV physicians, physiotherapists, occupational therapists, HIV specialist pharmacists and HIV specialist nurses into a single clinic is successful in identifying problems associated with ageing with HIV and, funding permitting, may be successfully replicated elsewhere depending on local clinic size, demographics and need.

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## AUTHOR CONTRIBUTIONS

HTJ, AS, NC, JW, LS, AK, AM-T and TJB were the professionals involved in the delivery of the service and involved

in data collection and curation. HTJ and TJB were responsible for the analysis. HTJ led on preparing the manuscript. All authors critically reviewed and approved the final version of the manuscript.

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## REFERENCES

- World Health Organization. *Decade of Healthy Ageing 2020–2030*. World Health Organization; 2020;2021.
- Poindexter C, Emler C. HIV-infected and HIV-affected older adults. In: Berkman B, D'Ambruso S, eds. *Handbook of Social Work in Health and Aging*. Oxford University Press; 2006:91-99.
- Public Health England. Progress towards ending the HIV epidemic in the United Kingdom. Vol 2021, 2018.
- Wing EJ. HIV and aging. *Int J Inf Dis*. 2016;53:61-68.
- Guaraldi G, Zona S, Brothers TD, et al. Aging with HIV vs. HIV seroconversion at older age: a diverse population with distinct comorbidity profiles. *PLoS One*. 2015;10:e0118531.
- Cesari M, Calvani R, Marzetti E. Frailty in older persons. *Clin Geriatr Med*. 2017;33:293-303.
- Falutz J. Frailty in people living with HIV. *Curr HIV/AIDS Rep*. 2020;17:226-236.
- Kooij KW, Wit FW, Schouten J, et al. HIV infection is independently associated with frailty in middle-aged HIV type 1-infected individuals compared with similar but uninfected controls. *AIDS*. 2016;30:241-250.
- Cunha ALL, Veronese N, de Melo BS, Ricci NA. Frailty as a predictor of adverse outcomes in hospitalized older adults: a systematic review and meta-analysis. *Ageing Res Rev*. 2019;56:100960.
- Welsh TJ, Gordon AL, Gladman JR. Comprehensive geriatric assessment—a guide for the non-specialist. *Int J Clin Pract*. 2014;68:290-293.
- Levett T, Alford K, Roberts J, Adler Z, Wright J, Vera JH. Evaluation of a combined HIV and geriatrics clinic for older people living with HIV: the silver clinic in Brighton, UK. *Geriatrics*. 2020;5:81.
- Greene M, Myers J, Tan JY, et al. The golden compass program: overview of the initial implementation of a comprehensive program for older adults living with HIV. *J Int Assoc Provid AIDS Care*. 2020;19:2325958220935267.
- Fried LP, Tangen CM, Walston J, et al. Frailty in older adults: evidence for a phenotype. *J Gerontol A Biol Sci Med Sci*. 2001;56:M146-M156.
- Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med*. 2001;16:606-613.
- Bloch M. Frailty in people living with HIV. *AIDS Res Ther*. 2018;15:19.
- Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med*. 2006;166:1092-1097.
- Nasreddine ZS, Phillips NA, Bédirian V, et al. The montreal cognitive assessment, MoCA: a brief screening tool for mild cognitive impairment. *J Am Geriatr Soc*. 2005;53:695-699.
- WHOQOL HIV Group. WHOQOL-HIV for quality of life assessment among people living with HIV and AIDS: results from the field test. *AIDS Care*. 2004;16:882-889.
- Ustun TB, Kostanjsek N, Chatterji S, Rehm J, World Health O. *Measuring health and disability: manual for WHO Disability Assessment Schedule (WHODAS 2.0)*. edited by T.B. Üstün, N. Kostanjsek, S. Chatterji, J.Rehm. World Health Organization; 2010.
- Pereira M, Martins A, Alves S, Canavarro MC. Assessing quality of life in middle-aged and older adults with HIV: psychometric testing of the WHOQOL-HIV-Bref. *Qual Life Res*. 2014;23:2473-2479.
- Meemon N, Paek SC, Yenchai D, Wan TT. Application of the WHOQOL-HIV-BREF questionnaire in HIV-infected Thai patients: reliability and validity of the instrument. *J Assoc Nurses AIDS Care*. 2016;27:698-708.
- Hanlon P, Nicholl BI, Jani BD, Lee D, McQueenie R, Mair FS. Frailty and pre-frailty in middle-aged and older adults and its association with multimorbidity and mortality: a prospective analysis of 493 737 UK Biobank participants. *Lancet Public Health*. 2018;3:e323-e332.
- Theou O, O'Connell MDL, King-Kallimanis BL, O'Halloran AM, Rockwood K, Kenny RA. Measuring frailty using self-report and test-based health measures. *Age Ageing*. 2015;44:471-477.
- Beanland A, Alagaratnam J, Goffe C, et al. Objective and subjective rapid frailty screening tools in people with HIV. *HIV Med*. 2021;22:146-150.
- Fuster-RuizdeApodaca MJ, Laguía A, Safreed-Harmon K, Lazarus JV, Cenoz S, del Amo J. Assessing quality of life in people with HIV in Spain: psychometric testing of the Spanish version of WHOQOL-HIV-BREF. *Health Qual Life Outcomes*. 2019;17:144.
- Nyirenda M, Chatterji S, Falkingham J, et al. An investigation of factors associated with the health and well-being of HIV-infected or HIV-affected older people in rural South Africa. *BMC Public Health*. 2012;12:259.
- Youn HM, Lee HJ, Lee DW, Park E-C. The impact of poverty transitions on frailty among older adults in South Korea: findings from the Korean longitudinal study of ageing. *BMC Geriatrics*. 2020;20:139.
- Kall M, Kelly C, Auzenbergs M, Delpech V. *Positive Voices: The National Survey of People Living with HIV - findings from the 2017 survey*. Public Health England; 2020.
- Department for Environment Food & Rural Affairs. Rural poverty statistics 2017-2018. Vol 2021, 2019.
- Walkden GJ, Anderson EL, Vink MP, Tilling K, Howe LD, Ben-Shlomo Y. Frailty in older-age European migrants: cross-sectional and longitudinal analyses of the survey of health, aging and retirement in Europe (SHARE). *Soc Sci Med*. 2018;213:1-11.
- Havlik RJ, Brennan M, Karpiak SE. Comorbidities and depression in older adults with HIV. *Sexual Health*. 2011;8:551-559.
- British HIV Association. *British HIV Association Standards of Care for People Living with HIV 2018*. BHIVA; 2018;2021.
- European AIDS Clinical Society. *EACS guidelines 2019*. EACS; 2019;2021.
- Winston A, Spudich S. Cognitive disorders in people living with HIV. *Lancet HIV*. 2020;7:e504-e513.
- Greene M, Covinsky KE, Valcour V, et al. Geriatric syndromes in older HIV-infected adults. *J Acquir Immune Defic Syndr*. 1999;2015(69):161-167.



36. Moylan KC, Binder EF. Falls in older adults: risk assessment, management and prevention. *Am J Med.* 2007;120:493.e1-493.e6.
37. Barnett A, Smith B, Lord SR, Williams M, Baumand A. Community-based group exercise improves balance and reduces falls in at-risk older people: a randomised controlled trial. *Age Ageing.* 2003;32:407-414.
38. Marvin V, Ward E, Poots AJ, Heard K, Rajagopalan A, Jubraj B. Deprescribing medicines in the acute setting to reduce the risk of falls. *Eur J Hosp Pharm.* 2017;24:10-15.
39. Erlandson KM, Allshouse AA, Jankowski CM, et al. Risk factors for falls in HIV-infected persons. *J Acquir Immune Defic Syndr.* 1999;2012(61):484-489.
40. Silverberg MJ, Ray GT, Saunders K, et al. Prescription long-term opioid use in HIV-infected patients. *Clin J Pain.* 2012;28:39-46.
41. Johnston PI, Wright SW, Orr M, et al. Worldwide relative smoking prevalence among people living with and without HIV. *AIDS.* 2021;35:957-970.
42. Kojima G, Iliffe S, Jivraj S, Liljas A, Walters K. Does current smoking predict future frailty? The English longitudinal study of ageing. *Age Ageing.* 2017;47:126-131.
43. Duko B, Ayalew M, Ayano G. The prevalence of alcohol use disorders among people living with HIV/AIDS: a systematic review and meta-analysis. *Subst Abuse Treat Prev Policy.* 2019;14:52.
44. Kojima G, Jivraj S, Iliffe S, Falcaro M, Liljas A, Walters K. Alcohol consumption and risk of incident frailty: the English longitudinal study of aging. *J Am Med Dir Assoc.* 2019;20:725-729.
45. Rehm J. The risks associated with alcohol use and alcoholism. *Alcohol Res Health.* 2011;34:135-143.
46. Maffei VJ, Ferguson TF, Brashear MM, et al. Lifetime alcohol use among persons living with HIV is associated with frailty. *AIDS.* 2020;34:245-254.
47. Smithson K, Gold D, Petretti S, et al. Healthcare needs beyond HIV in a changing NHS: participant exploration of positive voices data. *HIV Med.* 2019;20:61-62.
48. Cresswell FV, Levett T. Specialist care of older adults with HIV infection in the UK: a service evaluation. *HIV Med.* 2017;18:519-524.
49. Morley JE. The new geriatric giants. *Clin Geriatr Med.* 2017;33:xi-xii.

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