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Patient-centered care for people living with multimorbidity

Cynthia M. Boyd^a and Gregory M. Lucas^b

^aDivision of Geriatric Medicine and Gerontology, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA

^bDivision of Infectious Diseases, Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA

Abstract

Purpose of review—The purpose of this review is to consider a patient-centred approach to the care of people living with HIV (PLWH) who have multimorbidity, irrespective of the specific conditions.

Recent findings—Interdisciplinary care to achieve patient-centred care for people with multimorbidity is recognized as important, but the evaluation of models designed to achieve this goal are needed. Key elements of such approaches include patient preferences, interpretation of the evidence, prognosis as a tool to inform patient-centred care, clinical feasibility and optimization of treatment regimens.

Summary—Developing and evaluating the best models of patient-centred care for PLWH who also have multimorbidity is essential. This challenge represents an opportunity to leverage the lessons learned from the care of people with multimorbidity in general, and vice versa.

Keywords

HIV; multimorbidity; multiple chronic conditions; patient-centred care

INTRODUCTION

Over the past two decades, highly active antiretro-viral therapy (HAART) has increased the life expectancy of people living with HIV (PLWH) dramatically [1]. Remarkable as the therapeutic developments have been, however, HIV will remain an incurable infection for the foreseeable future, and optimal management will be defined as chronic suppression of viral replication. In recent years, much attention has been focused on aging with HIV and on the high rates of comorbidity in PLWH, despite well controlled viremia. Researchers have debated whether this represents a premature aging phenotype and the degrees to which prior damage to the immune system, chronic inflammation and immune activation, HIV

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Correspondence to Cynthia Boyd, MD, MPH, Center on Aging and Health, Center Tower, 7th Floor, Mason F. Lord Building, 5200 Eastern Avenue, Baltimore, MD 21224, USA. Tel: +1 410 550 8676; cyboyd@jhmi.edu.

Conflicts of interest

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medications or a high prevalence of behavioral and socioeconomic risk factors among PLWH contribute to comorbidity and functional impairment in this population [2–4]. Irrespective of the underlying mechanisms, it is undeniable that older PLWH have a high burden of comorbidity [5–10] and that we have limited data to guide us in the optimal care of these individuals.

Feinstein [11] originally defined comorbidity as ‘any distinct additional clinical entity that has existed or may occur during the clinical course of a patient who has the index disease under study’. The concept of an index condition, however, is inherently clinician or researcher centric and tends to track poorly with what patients perceive as important [12]. Prior to the advent of HAART, HIV – an inexorable killer that afflicted primarily young people – was undoubtedly an archetypal index condition. However, as antiretroviral treatment options have evolved to be potent, durable and well tolerated with minimal toxicity, the classification of HIV as the index condition in aging individuals with multiple conditions may be less apt. The term ‘multimorbidity’ was coined to emphasize a patient-centric view in the context of multiple chronic conditions and threats to function and quality of life [13] (Fig. 1). Although there is not a universally accepted definition, multimorbidity is frequently defined as the presence of at least two chronic conditions within an individual at the same time, wherein one condition is not necessarily more central than the others [14–16]. There is increasing recognition that HIV may not always be the dominant or most pressing condition [17,18] and that considering HIV as one piece in the life of a person living with multimorbidity may foster an approach that is more responsive to patient priorities. Moreover, it is easy to imagine that the importance of HIV infection may vary substantially over an individual’s lifetime, assuming predominant and consuming role at diagnosis and in early treatment, but becoming less important after decades of viral suppression with a simple medication regimen and multiple competing conditions.

Interest in the topic of patient-centred care for PLWH has grown because of increased risk of multimorbidity with aging and its implications for management of specific conditions in PLWH [19]. The prevalence of two or more chronic comorbidities in PLWH ranges from one-fifth to more than two-thirds, and partially depends on which conditions are considered and age [5–7,20–29,30²², 31–33]. Less is known about the patterns and temporality with which other conditions develop in PLWH [20–22].

Other articles in this series focus on many of the common coexisting conditions in PLWH. The extensive content on pairs of conditions as described in the other articles in this issue is important to inform the care of people who may be living with three, four or five conditions, but a patient-centred approach is essential to integrate this knowledge. The purpose of the present article, taking guidance from the field of geriatrics, is to consider a patient-centred approach to the care of PLWH who have multimorbidity, irrespective of the specific conditions.

Interdisciplinary care to achieve patient-centred care

An important challenge in caring for PLWH as they age – a challenge that mirrors that faced in the care of aging individuals in general – is providing patient-centred, interdisciplinary care. Consider the following definition of an interdisciplinary approach: ‘An

interdisciplinary team consists of practitioners from different professions who share a common patient population and common patient care goals and have responsibility for complementary tasks. The team is actively interdependent, with an established means of ongoing communication among team members and with patients and families to ensure that various aspects of patients' healthcare needs are integrated and addressed' [34]. An interdisciplinary team strategy may be contrasted with other common approaches to medical care delivery: the disciplinary or independent medical management approach, in which a practitioner works autonomously with limited input from other practitioners; the multidisciplinary care approach, which involves various healthcare practitioners working independently – not collaboratively – and in parallel, each responsible for a different patient care need, and the consultative approach, in which one practitioner retains central responsibility and consults with others as needed [35,36].

In this definition of interdisciplinary care, a key element is the integrated provision of holistic healthcare for the patient. 'Patient-centred care' is a popular and sometimes overused term in current medical care discourse, but it retains an intuitive and important meaning. Stewart wrote that patient-centred care 'may be most commonly understood for what it is not – technology centered, doctor centered, hospital centered, disease centered [37]'. Patient-centred care is care that is attentive to patients' psychosocial as well as physical needs, explores patient's concerns and priorities for care; conveys a sense of partnership between the patient and interdisciplinary team, facilitates active patient involvement in decision making and is coordinated across professionals, facilities and support systems [38,39]. Communication between providers, coordination of care and a system of shared responsibility for the patients are fundamental aspects of interdisciplinary care that aims to provide patient-centred care.

Interestingly, the early years of the HIV epidemic were characterized by interdisciplinary care at many centers due to the manifold and often baffling manifestations of AIDS [40²², 41]. Experts in neurology, psychiatry, oncology and ophthalmology – often with a strong interest in or passion for working with PLWH – collaborated closely HIV primary care providers. However, aging and multi-morbidity in this population frequently leads to the involvement of specialties different from those involved in the early HIV treatment era, such as cardiology, endocrinology, orthopedics and chronic pain management. Going forward, research is needed to define and prioritize outcomes that matter to patients and characterize healthcare delivery models that optimally provide patient-centred care to aging PLWH with multimorbidity [42–45].

Living with multimorbidity

Multimorbidity affects quality of life, ability to work and get a job, functional status, independence and life expectancy. The effect of additional conditions is not linear and depends on what conditions are considered, and how the conditions are measured, and there is heterogeneity in the effects of specific conditions on these important outcomes [46–51].

The context in which people with multimorbidity live their lives is also fundamental to care. A recent National Institute of Health/Patient-Centered Outcomes Research Institute workshop on the context of multimorbidity identified that moving from 'what is the matter'

to ‘what matters to you’ was an essential shift in how we organize care, and how interdisciplinary teams approach the care of individuals [12]. People with multimorbidity have greater ‘self-care’ needs, but for many patients, this term may be a misnomer, given the role that family and trusted others (hereafter both groups are called family) play in the management of their health, most of which occurs outside of the healthcare system itself [52,53]. Thus, for many patients, patient-centred care may mean patient-centred and family-centred care [54].

Not surprisingly, people living with multimorbidity attend more healthcare visits, are prescribed more medications, undergo more interventions and are subject to more frequent medical monitoring than people with fewer conditions [22,55]. There has been increased scrutiny of the challenges in using single-disease guidelines for older patients with multimorbidity, a population that has been rarely represented in the efficacy trials underlying recommendations and vulnerable to the risks of polypharmacy [55–57]. For example, we explored the ramifications of applying relevant clinical practice guidelines to a hypothetical 79-year-old woman with five common chronic conditions (osteoporosis, hypertension, diabetes, chronic obstructive pulmonary disease and osteoarthritis). Assiduously following disease-specific clinical practice guidelines in this hypothetical patient led to the prescription of 12 medications for a total of 19 pills per day, a myriad of lifestyle and nonpharmacologic treatments, frequent medical follow-up and monitoring, potentially interacting medications and some [55]. Undoubtedly, this disease-centric approach would be perceived by many, if not most patients, as burdensome [52,55,58–62,63]. However, healthcare delivery models currently provide little guidance on eliciting individual patient preferences or for communicating potential benefits and risks in order to prioritize care in a patient-centred way.

Fundamental to achieving optimal care for people multimorbidity is the idea that must learn to prioritize which, of all possible interventions as summarized in Table 1, are actually most important for an individual patient. ‘Importance’ is defined here as those elements of the treatment regimen that are most likely to help an individual achieve the outcomes of importance to them. Individual characteristics affect risk of outcomes, and our ability to predict risk of specific outcomes reasonably accurately for individuals is highly variable across conditions and populations [64,65^{¶¶}]. Determining which are patient-important outcomes (benefits and harms) is vital to any assessment of the quality of the evidence, and that the estimated risk of these patient important outcomes are needed to understand the balance of benefits and harms of interventions being considered for people with multimorbidity. The combination of individualized risk profiles for all relevant outcomes, the quality of the evidence about treatment effects and preferences for specific outcomes are necessary to prioritize the relative importance of all possible interventions in people with multimorbidity [66,67,68^{¶¶}, 69,70]. All indicators suggest that providing care to aging PLWH will share similar challenges to prioritizing care as for all older patients with multimorbidity [67].

Caring for people with multimorbidity

Recently, the American Geriatrics Society organized an Expert Panel focused on Older Adults with Multimorbidity, and highlighted five domains that must be addressed in order to move from a disease-specific approach to one that is truly patient-centred [55,71¹¹]. The optimal methods for achieving this type of patient-centred care in people with multimorbidity are unknown [55,71¹¹–73¹¹].

The five domains are as follows:

1. **Patient preferences:** Elicit and incorporate patient preferences into medical decision-making for older adults with multimorbidity. Older adults with multimorbidity are able to evaluate choices and prioritize their preferences for care [74–76] and it is necessary to recognize that most decisions in people with multimorbidity are, in fact, preference sensitive. Adequately informing patients about the expected benefits and harms of treatment options is necessary prior to eliciting preferences for specific decisions, although discussing overarching goals of care first may be an appropriate lead-in to these conversations.
2. **Interpret evidence:** Recognizing the limitations of evidence base, interpret and apply the medical literature to older adults with multi-morbidity. To help evaluate whether specific information, from a clinical practice guideline, systematic review or continuing medical education lecture, as examples of the evidence base, applies to an older person with multimorbidity, the evidence should be examined on the basis of several key concepts. These include assessing the applicability and quality of evidence using established methodologies, determining whether the outcomes reported in the literature are meaningful to patients, or are they surrogate outcomes, determining harms and burdens, and recognizing that these may be different in people with multimorbidity compared with the general population, considering absolute risk reduction whenever possible, in light of variations in baseline risk according to patient profiles, and understanding the time horizon necessary to achieve benefit [77].
3. **Similar challenges exist in the interpretation of existing clinical data when managing multi-morbidity in PLWH.** In general, we must extrapolate results from efficacy trials conducted in the general population when managing coexisting conditions in PLWH. Although it is neither feasible nor scientifically desirable to repeat clinical trials for common conditions in HIV-infected populations, it is important to recognize HIV infection, HIV-associated immune activation or competing risks in HIV-infected persons that may modify the efficacy of some treatments compared with estimates from the general population [78,79]. An additional consideration is that surrogate markers for chronic conditions, such as glycosylated hemoglobin in type 2 diabetes mellitus, may vary in the degree to which they track with patient important outcomes across different populations. For example, in older individuals with diabetes and multiple conditions, HgbA1c is weakly correlated with survival or functional outcomes, and it may be a poor surrogate for patient important outcomes, as evidenced by the fact that tight glycemic control in older patients with type 2 diabetes mellitus has been associated

with a greater risk of death [80,81]. Thus, providers are right to be sceptical about the degree to which efficacy/risk estimates from trials from non-HIV-infected persons translate to aging PLWH and multimorbidity. Researchers are challenged to identify factors that might alter the efficacy of treatment of comorbid conditions in PLWH and to conduct targeted clinical trials when appropriate.

4. Prognosis: Frame clinical management decisions within the context of risks, burdens, benefits and prognosis (remaining life expectancy, functional status, quality of life) for older adults with multimorbidity. Each person's prognosis should inform, not dictate, clinical management decisions within the context of a patient's preferences. A discussion about prognosis can serve as a springboard for difficult conversations, in terms of identifying what matters to the patient, patient preferences, treatment rationales, and can be used to inform prioritization of treatments for the individual. With increasing interest in using accurate risk prediction to tailor care in PLWH, similar challenges to those faced in the aging population with multimorbidity exist, and include how to discuss such prognostic information with patients and families, including uncertainty about estimates [30¹¹, 55,71¹²,79,82,83].
5. Clinical feasibility: Consider treatment complexity and feasibility when making clinical management decisions for older adults with multimorbidity. Increasing regimen complexity is associated with a higher likelihood of non-adherence, adverse events, economic burden and declines in quality of life for patients, and with greater strain and depression in caregivers [52,84–88]. Clinical feasibility and patient preferences should inform treatment decisions. Concordance between providers and patients leads to greater motivation, persistence and adherence. Care transitions are important opportunities to reevaluate treatment regimens, including the potential for interactions, treatment regimen complexity and adherence. Poly-pharmacy is common in PLWH [89]. Gains in reducing the complexity of HAART for PLWH should not be counterbalanced by such large extent of chronic medications for other chronic conditions that adherence is diminished. Rather, we must thoughtfully choose which treatments for other chronic conditions are most likely to benefit the PLWH and effectively prioritize among all the possible treatments in light of the person's own preferences and context.
6. Optimizing treatment regimens: Use strategies for choosing therapies that optimize benefit, minimize harm and enhance quality of life for older adults with multimorbidity. People with multimorbidity take more medicines and have a greater risk of adverse events exacerbated not only by the condition-specific changes to organ systems but also age-related changes in pharmacokinetics and pharmacodynamics. Reducing the number of medications, particularly high-risk medications, can lower the risk of adverse drug reactions. Several criteria exist to identify potentially inappropriate medications, but consideration of the full list of a patient's medications may identify additional opportunities to eliminate medications that people no longer need or are not likely to be beneficial [90,91]. If a decision is made to stop a medication, most medications can be discontinued

safely without tapering, and generally in the outpatient setting, it is recommended to make one change at a time in older adults.

CONCLUSION

Developing and evaluating the best models of patient-centred care for PLWH who also have multi-morbidity is essential. This challenge represents an opportunity to leverage the lessons learned from the care of people with multimorbidity in general, and vice versa.

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KEY POINTS

- Communication between providers, coordination of care and a system of shared responsibility for the patients are fundamental aspects of interdisciplinary care that aims to provide patient-centred care.
- HIV may not always be the dominant or most pressing condition, and considering HIV as one piece in the life of a person living with multimorbidity may foster an approach that is more responsive to patient priorities.
- The combination of individualized risk profiles for all relevant outcomes, the quality of the evidence about treatment effects and preferences for specific outcomes are necessary to prioritize the relative importance of all possible interventions in people with multimorbidity.
- Achieving patient-centered care in people living with multimorbidity depends on incorporating patient preferences, the interpretation of available evidence, prognostic information and clinical feasibility to achieve optimal treatment regimens that optimize outcomes important to PLWH.

FIGURE 1.

Conceptual diagram of comorbidity: index disease, with one or more comorbid condition or diseases affecting its course and treatment comorbidity has often been studied and treated in clinical practice from the perspective of an index disease, and one or more comorbid diseases may typically be considered. These diseases may affect the course and treatment of the index disease to varying degrees (varied weight of connecting bars). This framework may create disjointed treatment plans for each of the diseases and become cumbersome in patients with several coexisting diseases. Conceptual diagram of multimorbidity within an individual person's circumstances and preferences. The perspective of multimorbidity may be useful for treating patients with multiple conditions. Conditions not only include traditional diseases but also may reflect conditions such as falls, hearing impairment and sarcopenia that fall outside the traditional disease model. These conditions may overlap to varying degrees. The intersecting conditions exist within a context of biological health and reserves, as well as the psychological circumstances of a person (i.e. a positive affect). The conditions also unfold for given people within their social, educational, cultural, economic and environmental circumstances, and these will affect management of the multimorbid conditions. The person with multimorbidity also has individual values and priorities for their life and healthcare, which need to be elicited and factored into treatment plans. Adapted with permission from Boyd and Fortin [14].

Clinical Practice Guideline-based treatment regimen for hypothetical 79-year-old woman with hypertension, diabetes mellitus, osteoarthritis, osteoporosis and chronic obstructive pulmonary disease

Table 1

Time	Medications	Nonpharmacologic interventions	Daily	Periodic
7 : 00 a.m.	Ipratropium MDI	Check feet	Joint protection	Pneumonia vaccine
	Alendronate 70 mg p.o. weekly	Sit upright for 30 min on day of alendronate	Energy conservation	Yearly influenza vaccine
		Check blood glucose	Exercise	Yearly test for microalbuminuria if not already present
8 : 00 a.m.	Calcium (500 mg) + Vit D (200 IU) p.o.	2.4 g sodium	Nonweight-bearing if foot disease, weight-bearing for osteoporosis	Evaluate self-monitoring of blood glucose
Eats breakfast	HCTZ 12.5 mg p.o.	90 mmol potassium	Aerobic exercise for 30 min on most days	Foot examination at all provider visits if neuropathy, otherwise check annually for protective sensation, foot structure, biomechanics, vascular status and skin integrity.
	Lisinopril 40 mg p.o.	Decreased dietary saturated fat and cholesterol	Muscle strengthening exercises	BP check at all provider visits, at times check BP at home ^b
	Glyburide 10 mg p.o.	Adequate magnesium and calcium	Range of motion exercises	Blood tests
	Aspirin 81 mg p.o.	Medical nutrition therapy for diabetes ^a	Avoid environmental exposures that might exacerbate COPD	Biannual to quarterly glycosylated hemoglobin, depending on control
	Metformin 850 mg p.o.	DASH ^a	Wear appropriate footwear	Check creatinine and electrolytes at least 1–2 times per year
	Naproxen 250 mg p.o.		Albuterol MDI as needed	
	Omeprazole 20 mg p.o.		Limit alcohol	
9 : 00 a.m.			Maintain normal body weight (BMI 18.5–24.9 kg/m ²)	
10 : 00 a.m.				
11 : 00 a.m.				
12 : 00 p.m.		2.4 g sodium		
Eats lunch		90 mmol potassium		
		Decreased dietary saturated fat and cholesterol		
		Adequate magnesium and calcium		
		Medical nutrition therapy for diabetes ^a		

Time	Medications	Nonpharmacologic interventions	Daily	Periodic
1 : 00 p.m.	Ipirtropium MDI calcium (500 mg) +Vit D (200 IU) p.o.	DASH ^a		Yearly cholesterol check Biannual liver function tests Referrals Physical therapy Yearly ophthalmologic examination Pulmonary rehabilitation DEXA scan every other year Patient education High-risk foot conditions, foot care, foot wear Osteoarthritis COPD medication and delivery system training Diabetes mellitus
2 : 00 p.m.				
3 : 00 p.m.				
4 : 00 p.m.				
5 : 00 pm				
6 : 00 p.m. Eats dinner				
7 : 00 p.m.	Ipirtropium MDI Meformin 850 MG p.o.	2.4 g sodium 90 mmol potassium		
	Calcium (500 mg) +Vit D (200 IU) p.o.	Decreased dietary saturated fat and cholesterol		
	Lovastatin 40 mg p.o.	Adequate magnesium and calcium		
	Naproxen 250 mg p.o.	Medical nutrition therapy for diabetes ^a		
		DASH ^a		
8 : 00 p.m.				
9 : 00 p.m.				
10 : 00 p.m.				
11 : 00 p.m.	Ipirtropium MDI			

Twelve separate medications. Medication Complexity Score = 14, with 19 doses of medications per day, assuming 2 pm (as needed) doses of Albuterol MDI, as well as weekly alendronate. Medication Complexity Score: A regimen with seven different medications consisting of four once-a-day and three twice-a-day drugs generates a complexity score of three (1 +2). A regimen with one nightly drug, two twice-a-day drugs and one thrice-a-day drug has a complexity score of six (1 +2 +3). BP, blood pressure; COPD, chronic obstructive pulmonary disease; DASH, Dietary Approaches to Stop Hypertension; DEXA, Dual-energy X-ray absorptiometry; HCTZ, hydrochlorothiazide; IU, international units; MDI, metered dose inhaler; mg, milligram; p.o., orally; Vit, Vitamin. Clinical Practice Guidelines: (See citations for guidelines in Boyd CM *et al.* JAMA 2005), Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure VII. American Diabetes Association. Glycemic control is recommended by ADA guidelines; however, specific medicines are not described. American College of Rheumatology. Recent evidence about the safety and appropriateness of cyclooxygenase inhibitors, particularly in people with comorbid cardiovascular disease, led us to omit them from the list of medication options, although they are discussed in the reviewed CPGs. National Osteoporosis Foundation. This regimen assumes dietary intake of 200 IU of Vitamin D. National Heart Lung Blood Institute/WHO. Reproduced with permission from Boyd *et al.* [55].

^aIt is possible to synthesize the dietary recommendations present in DASH with ADA recommendations into a diet with variety. The help of a registered dietitian is specifically recommended. The ADA Medical Nutrition Therapy recommendations include foods containing carbohydrate from whole grains, fruits, vegetables and low-fat milk. Avoid protein intake >20% of total daily energy. Limit saturated fat (<10% of total energy intake) and dietary cholesterol (<200–300 mg). Limit intake of transunsaturated fatty acids, with 2–3 servings per week of fish. Polyunsaturated fat should be about 10% of energy intake. Lower protein intake if overt nephropathy (about 10% of daily calories).

^b Ambulatory blood pressure monitoring is helpful if "white coat hypertension" is suspected and no target organ damage, apparent drug resistance, hypotensive symptoms with antihypertensive medication or episodic hypertension.