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Care of HIV Patients in Long-Term Care Facilities: A Growing Concern and a Call to Action

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Abstract

As the population of people living with HIV (PWH) ages, they face increased risks of chronic diseases and may require care in nursing homes (NHs). This study identifies systemic barriers to optimal HIV care in NHs through three case examples, illustrating issues such as knowledge gaps in HIV management across the care spectrum, miscommunication during transition of care, and stigma. Proposed solutions include targeted education, improved drug interaction software, and enhanced protocols for HIV care in NHs. Addressing these gaps is crucial for improving outcomes for this aging and vulnerable population.

Keywords: HIV, Long term care, aging and HIV, HIV in nursing homes, HIV stigma

Introduction

Persons living with HIV (PWH) are living longer. HIV prevalence data from 2021 shows 63.3% of PWH are over 45 years-old (and 40.6% are aged 55+) (1). The projection is that by 2030, over 70% of PLWH will be older than 50 years (2). As PWH ages, they face onset of inflammation and the increased risk of chronic diseases such as cardiovascular disease, diabetes, renal disease and musculoskeletal afflictions. These conditions could result in the need for temporary or permanent care in nursing homes (NH). HIV has become more manageable with single tablet regimens and long acting injectables. However, NH teams may lack the specialized training to address HIV care, leading to care gaps for PWH at NH settings. Literature suggests most NH do not provide HIV/AIDS specialty care (3) and challenges in care range from lower quality of care (4); to worse outcomes for PWH in NH compared to those not living with HIV (5). We have identified three cases of PWH hospitalized from NH to highlight some of the care gaps for PWH in NH settings. Our goal is not to critique the qualification of NH teams or the qualities of NH facilities but to highlight the need for systemic changes in education and institutional protocols around HIV care in NHs.

Case 1: A 63-year-old male was readmitted to a NH after recurrent hospitalizations. The patient's medication reconciliation was flagged by the NH pharmacy for duplicate therapy, noting that "Prezista (darunavir) and ritonavir have the same mechanism of action (protease inhibitor)." Investigation showed that darunavir and ritonavir were the only antiretrovirals on the medication reconciliation. Prior to the last hospitalization, his regimen was listed as lamivudine (3TC), darunavir/ritonavir (DRV/r). Records from three years prior showed he was on abacavir (ABC), 3TC, DRV/r. His last CD4 count was 577 cells/μL and 13% with an undetectable viral load. The

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patient was restarted on ABC/3TC/DRV/r with follow-up labs and appointment orders. The lead pharmacist later clarified that the alert should not have been sent to providers, but did not specify which drug reference system generated the alert.

Case 2: A 57-year-old male was admitted to a NH after a severe motor vehicle accident with multiple fractures and injuries leading to impaired memory. The NH staff was aware he had been followed by a local clinic but was not aware the clinic serves PWH. It was not until three months later when an alert NH staff member noticed the clinic name and realized the patient had been living with HIV. The patient was restarted on his antiretrovirals after additional records were obtained. His CD4 count was 461 cells/μL and 29% with a viral load of 148,339 copies when he resumed his antiretroviral therapy (ART).

Case 3: A 54-year-old female living with HIV was admitted from a NH with fever and pneumonia. Her medication reconciliation showed she was only on 3TC and lopinavir/ritonavir (LPV/r). She had been seen in the same hospital three times over the course of four years where her ART was always documented as only 3TC and LPV/r. The very first note from four years ago mentioned the patient's HIV was under control with a CD4 count over 500 cells/μL and an undetectable viral load. By the most recent admission, her CD4 count was 89 cells/μL and 26%, with a viral load of 756 copies. She was started on trimethoprim/sulfamethoxazole (TMP/SMX) prophylaxis, and viral load and genotype testing were ordered. She was started on tenofovir disoproxil fumarate/emtricitabine/dolutegravir (TDF/FTC/DTG) via G-tube at the time of discharge with follow-up scheduled.

Barriers and gaps that we have identified based on the presented cases are:

- Due to the high cost of current co-formulated HIV medications, many inpatient pharmacies, particularly community-based ones, are unable to provide the combination pills. Instead, they are provided as individual components. This introduces complexity (multiple medications being reconciled into one single medication or vice versa during admissions/discharges) and confusion (due to lack of provider knowledge about appropriate combinations and/or substitutions of HIV medications).
- In a NH setting, PWH, even without regular visits for HIV care, might continue to receive antiretroviral regimens, including inadequate ones, often under the false impression that "something is better than nothing." It is insufficient for NH teams to recognize the importance of PWH taking HIV medications; it is also critical for providers to recognize inappropriate/inadequate ART regimens for escalation and further review.
- Drug-checking software used by the general public as well as pharmacies needs to be validated with regard to the appropriate classification of ritonavir (and cobicistat). We surveyed five online drug-checking websites (four available to general consumers and one healthcare provider-oriented/restricted). None of them marked ritonavir or cobicistat as duplicate therapy with any of the protease inhibitors (PIs) we assessed. However, the results from consumer-oriented websites are not uniformly satisfactory. One website consistently flagged multiple ritonavir+PI or cobicistat+PI combinations as “Serious - Use Alternative.” A second site also gives inconsistent warnings depending on the order of the two drugs. Most sites flag many of the boosted-PI combinations as “SERIOUS/MAJOR.” The website restricted to healthcare providers consistently has more accurate and nuanced discussions about the combinations, referencing the use of ritonavir and cobicistat specifically as boosting agents in available combinations (6, 7, 8, Additional Material).
- Finally, we do not consider this a true care gap but more of a reflection of the historical stigma associated with HIV infection. Many well-established HIV clinics either use euphemisms or do not mention HIV directly in their names. This does pose additional challenges during patient intakes.

These barriers can potentially undo years of excellent work by the medical community in reversing the devastating impact of HIV infections across the U.S. Possible approaches to address barriers identified above include:

- Targeted education during training (medical, pharmacy, nurse practitioner, and physician assistant schools; emergency, family, and internal medicine, as well as pharmacy residencies) plus continuing education about infections that require cocktail therapies (e.g., HIV, active tuberculosis) and basic awareness about what constitutes appropriate regimens for these infections.
- Enhancements to drug interaction-checking software to better recognize combination therapies. Disclaimers or prompts should be added to ensure that providers verify the completeness of prescribed regimens.
- Implement pharmacy protocols to escalate medications that are often part of combination therapies for infections mentioned above to ensure appropriate, complete regimens are being dispensed for the correct diagnoses (PrEP vs. HIV infection, or latent TB vs. active TB).
- Mandate HIV screening tests or verification of HIV status with the local department of health as a part of NH intake processes. The mandate would be in line with current recommendations on HIV screening from the CDC. (9).

PWH living in NH settings can be particularly vulnerable to receiving suboptimal HIV care. The cases presented highlight the need for systemic changes, including improved education, enhanced drug interaction software, and better protocols for the care of PWH in NH settings. Addressing these gaps is essential to improving outcomes for this aging and vulnerable population.

Additional Material:

"Evaluation of Online Drug Interaction Checkers" Excel Sheet. Accessed February 4th, 2025.

Author Contributions:

M.L.: Conceptualization. Case contribution. Writing.

W.D.K.: Conceptualization. Writing.

D.B.: Conceptualization. Case contribution. Writing - Review & Editing.

M.H.L.: Drug interaction checker investigation and data collection, curation, and analysis. Writing - Original Draft.

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IRB Statement and Consent

This project qualifies as a case report and is exempt from Institutional Review Board (IRB) review under the U.S. Department of Health and Human Services (HHS) regulations [45 CFR 46.102(l)].

A case report is defined as a descriptive presentation of clinical information from the treatment of one or two patients, and is not considered "research" as defined by federal regulations because it does not involve a systematic investigation designed to contribute to generalizable knowledge. Instead, the intent is to share unique clinical observations for educational or professional purposes, without hypothesis testing or data analysis across multiple patients.

This case report Involves three patients. It is based solely on retrospective, clinical care documentation.

Does not involve any prospective data collection or experimental intervention. Does not use identifiable private health information without consent, in compliance with HIPAA. It is not intended as a research study and does not include a methodology to test or validate hypotheses. Therefore, in accordance with HHS guidelines and institutional policy, this case report does not constitute human subjects research and is exempt from IRB review.

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Liu M, et al., Arch Clin Med Case Rep 2025
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Additional Material

Drug Interaction Checkers	Protease Inhibitor	Drugs Interactions (with ritonavir)	Drugs Interactions (with cobcistat)
https://reference.medscape.com/drug-interactionchecker	Amprenavir.	N/A	N/A
		Monitor Closely atazanavir + ritonavir	
		atazanavir will increase the level or effect of ritonavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Use Caution/Monitor.	
		atazanavir + ritonavir	
		atazanavir and ritonavir both increase risk of immune reconstitution syndrome. Use Caution/ Monitor.	
			Serious - Use Alternative atazanavir + cobicistat
		Minor	atazanavir will increase the level or effect of cobicistat by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Avoid or Use Alternate Drug.
	Atazanavir.	ritonavir + atazanavir	
		ritonavir will increase the level or effect of atazanavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Minor/Significance Unknown.	cobicistat + atazanavir
			cobicistat will increase the level or effect of atazanavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Avoid or Use Alternate Drug.
		Serious - Use Alternative ritonavir + darunavir	
		ritonavir will increase the level or effect of darunavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Avoid or Use Alternate Drug.	
		Monitor Closely darunavir + ritonavir	
		darunavir will increase the level or effect of ritonavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Use Caution/Monitor.	
			Serious - Use Alternative cobicistat + darunavir
		darunavir + ritonavir	cobicistat will increase the level or effect of darunavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Avoid or Use Alternate Drug.
	Darunavir.	darunavir and ritonavir both increase risk of immune reconstitution syndrome. Use Caution/Monitor.	
			darunavir + cobicistat
			darunavir will increase the level or effect of cobicistat by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Avoid or Use Alternate Drug.
		Monitor Closely indinavir + ritonavir	
		indinavir will increase the level or effect of ritonavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Use Caution/Monitor.	
		ritonavir + indinavir	
		ritonavir will increase the level or effect of indinavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Use Caution/Monitor.	

Liu M, et al., Arch Clin Med Case Rep 2025
DOI:10.26502/acmcr.96550727

		Contraindicated cobicistat + indinavir
	indinavir + ritonavir	cobicistat will increase the level or effect of indinavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Contraindicated. Contraindicated with cobicistat coadministered with atazanavir only; both atazanavir and indinavir are associated with indirect (unconjugated) hyperbilirubinemia
	indinavir will increase the level or effect of ritonavir by P-glycoprotein (MDR1) efflux transporter. Use Caution/Monitor.	
		Serious - Use Alternative indinavir + cobicistat
Indinavir.	indinavir + ritonavir	indinavir will increase the level or effect of cobicistat by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Contraindicated.
	indinavir and ritonavir both increase risk of immune reconstitution syndrome. Use Caution/ Monitor.	
	Serious - Use Alternative ritonavir + fosamprenavir ritonavir will increase the level or effect of fosamprenavir by affecting hepatic/ intestinal enzyme CYP3A4 metabolism. Avoid or Use Alternate Drug.	
	Monitor Closely fosamprenavir + ritonavir	
	fosamprenavir will increase the level or effect of ritonavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Use Caution/Monitor.	
	fosamprenavir + ritonavir	
Fosamprenavir.	fosamprenavir and ritonavir both increase risk of immune reconstitution syndrome. Use Caution/ Monitor.	
		No Interactions Found
	Monitor Closely ritonavir + lopinavir	
Lopinavir.	ritonavir will increase the level or effect of lopinavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Use Caution/Monitor.	
		No interactions Found
	Monitor Closely nelfinavir + ritonavir	
	nelfinavir will increase the level or effect of ritonavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Use Caution/Monitor.	
	ritonavir + nelfinavir	
	ritonavir will increase the level or effect of nelfinavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Use Caution/Monitor.	
	ritonavir + nelfinavir	
	ritonavir will increase the level or effect of nelfinavir by P-glycoprotein (MDR1) efflux transporter. Use Caution/Monitor.	

Liu M, et al., Arch Clin Med Case Rep 2025
DOI:10.26502/acmcr.96550727

	Nelfinavir.	nelfinavir + ritonavir	
		nelfinavir and ritonavir both increase risk of immune reconstitution syndrome. Use Caution/ Monitor.	
			No interactions Found
		Serious - Use Alternative saquinavir + ritonavir	
		saquinavir will increase the level or effect of ritonavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Avoid or Use Alternate Drug.	
		Monitor Closely ritonavir + saquinavir	
		ritonavir will increase the level or effect of saquinavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Use Caution/Monitor.	
			Serious - Use Alternative cobicistat + saquinavir
		ritonavir + saquinavir	cobicistat will increase the level or effect of saquinavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Avoid or Use Alternate Drug.
		ritonavir will increase the level or effect of saquinavir by P-glycoprotein (MDR1) efflux transporter. Use Caution/Monitor.	
			cobicistat + saquinavir
		ritonavir + saquinavir	cobicistat will increase the level or effect of saquinavir by P-glycoprotein (MDR1) efflux transporter. Avoid or Use Alternate Drug.
	Saquinavir.	ritonavir and saquinavir both increase risk of immune reconstitution syndrome. Use Caution/ Monitor.	
			saquinavir + cobicistat
			saquinavir will increase the level or effect of cobicistat by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Contraindicated.
			Contraindicated cobicistat + tipranavir
		Monitor Closely ritonavir + tipranavir	cobicistat will increase the level or effect of tipranavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Contraindicated.
		ritonavir will increase the level or effect of tipranavir by affecting hepatic/intestinal enzyme CYP3A4 metabolism.	
			Serious - Use Alternative tipranavir + cobicistat
		ritonavir + tipranavir	tipranavir will increase the level or effect of cobicistat by affecting hepatic/intestinal enzyme CYP3A4 metabolism. Contraindicated.
	Tipranavir.	ritonavir and tipranavir both increase risk of immune reconstitution syndrome. Use Caution/ Monitor.	
	Amprenavir.	N/A	N/A
		MONITOR CLOSELY	
		Significant interaction possible (monitoring by your doctor required).	

Liu M, et al., Arch Clin Med Case Rep 2025
DOI:10.26502/acmcr.96550727

		Atazanavir + Ritonavir	
		Atazanavir will increase the level or effect of Ritonavir by altering drug metabolism.	
		Atazanavir and Ritonavir both increase risk of immune reconstitution syndrome MINOR	
		Interaction is unlikely, minor, or nonsignificant.	SERIOUS
			Potential for serious interaction; regular monitoring by your doctor required or alternate medication may be needed.
	Atazanavir.	Ritonavir + Atazanavir	
		Ritonavir will increase the level or effect of Atazanavir by altering drug metabolism.	Atazanavir + Cobicistat
			Atazanavir will increase the level or effect of Cobicistat by altering drug metabolism.Atazanavir will increase the level or effect of Cobicistat by altering drug metabolism. Atazanavir will increase the level or effect of Cobicistat by altering drug metabolism.Atazanavir will increase the level or effect of Cobicistat by altering drug metabolism.
			SERIOUS
		SERIOUS	Potential for serious interaction; regular monitoring by your doctor required or alternate medication may be needed.
https://www.webmd.com/interaction-checker/default.htm		Potential for serious interaction; regular monitoring by your doctor required or alternate medication may be needed.	
			Darunavir + Cobicistat
	Darunavir.	Ritonavir + Darunavir	Darunavir will increase the level or effect of Cobicistat by altering drug metabolism.Darunavir will increase the level or effect of Cobicistat by altering drug metabolism. Darunavir will increase the level or effect of Cobicistat by altering drug metabolism. Darunavir will increase the level or effect of Cobicistat by altering drug metabolism.
		Ritonavir will increase the level or effect of Darunavir by altering drug metabolism.	
			DON'T USE TOGETHER
			Never use this combination of drugs because of high risk for dangerous interaction.
		MONITOR CLOSELY	
		Significant interaction possible (monitoring by your doctor required).	Cobicistat + Indinavir
			Cobicistat will increase the level or effect of Indinavir by altering drug metabolism.
		Indinavir + Ritonavir	
		Indinavir will increase the level or effect of Ritonavir by altering drug metabolism.	Additional Information: Cobicistat increases levels or effect of indinavir. This combination should be avoided. SERIOUS
		Indinavir will increase the level or effect of Ritonavir by affects how the drug is eliminated from the body Indinavir and Ritonavir both increase risk of immune reconstitution syndrome	Potential for serious interaction; regular monitoring by your doctor required or alternate medication may be needed.
		Indinavir will increase the level or effect of Ritonavir by altering drug metabolism.	
	Indinavir.		Indinavir + Cobicistat
			Indinavir will increase the level or effect of Cobicistat by altering drug metabolism.