



# Cardiovascular Risk Management among Persons Living with HIV: Does Provider Specialty Matter?



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## Introduction

- Persons living with HIV (PLWH) are at 1.5-2x increased risk of major cardiovascular disease (CVD) events than uninfected persons.
- CVD risk factor management in PLWH is often rendered by specialty providers because of the varied models of chronic disease care delivery in this population.
- The implications of provider specialty on meeting evidence-based CVD risk factor goals among PLWH is unclear.

## Methods

- Retrospective analysis of all PLWH with hypertension and/or hyperlipidemia receiving outpatient care at three university-based infectious disease (ID) clinics: Duke, Wake Forest Baptist, Medical University of South Carolina (MUSC) between 2013 and 2017.
- Clinical data was obtained from the Carolinas Collaborative Research Network Database, a compendium of clinical data from the EMR of 9 healthcare systems in North and South Carolina, and part of the Stakeholders, Technology and Research (STAR) Clinical Research Network.
- Data was abstracted on persons with hypertension and/or hyperlipidemia prior to the start of the study period and without history of ASCVD (acute coronary syndrome, stroke, coronary artery intervention or peripheral vascular disease).
- Hypertension and hyperlipidemia were determined by the presence of either diagnosis on a patient's EMR problem list.
- In the database, clinic of origination of medication prescription order was used as a surrogate for provider specialty, given absence of identifying data for individual providers.
- Responsible clinic for hypertension/hyperlipidemia management (and associated specialty) were defined by prescriptions ordered (antihypertensive or statin) and classified as follows: ID clinic only ( $\geq 3$  prescriptions without evidence of prescription entry from alternate clinic), non-ID primary care clinic only, co-managed by ID and primary care, medication prescribed by other (non-ID or PCP) clinic, no evidence of prescription.
- Patients followed until ASCVD event, death or end of study observation period.
- Primary outcome for hypertension was meeting JNC 8 goals at end of observation period; for hyperlipidemia: change in end observation LDL from baseline.
- Logistic regression model adjusted for age, gender, race/ethnicity and insurance status.

## Hypothesis

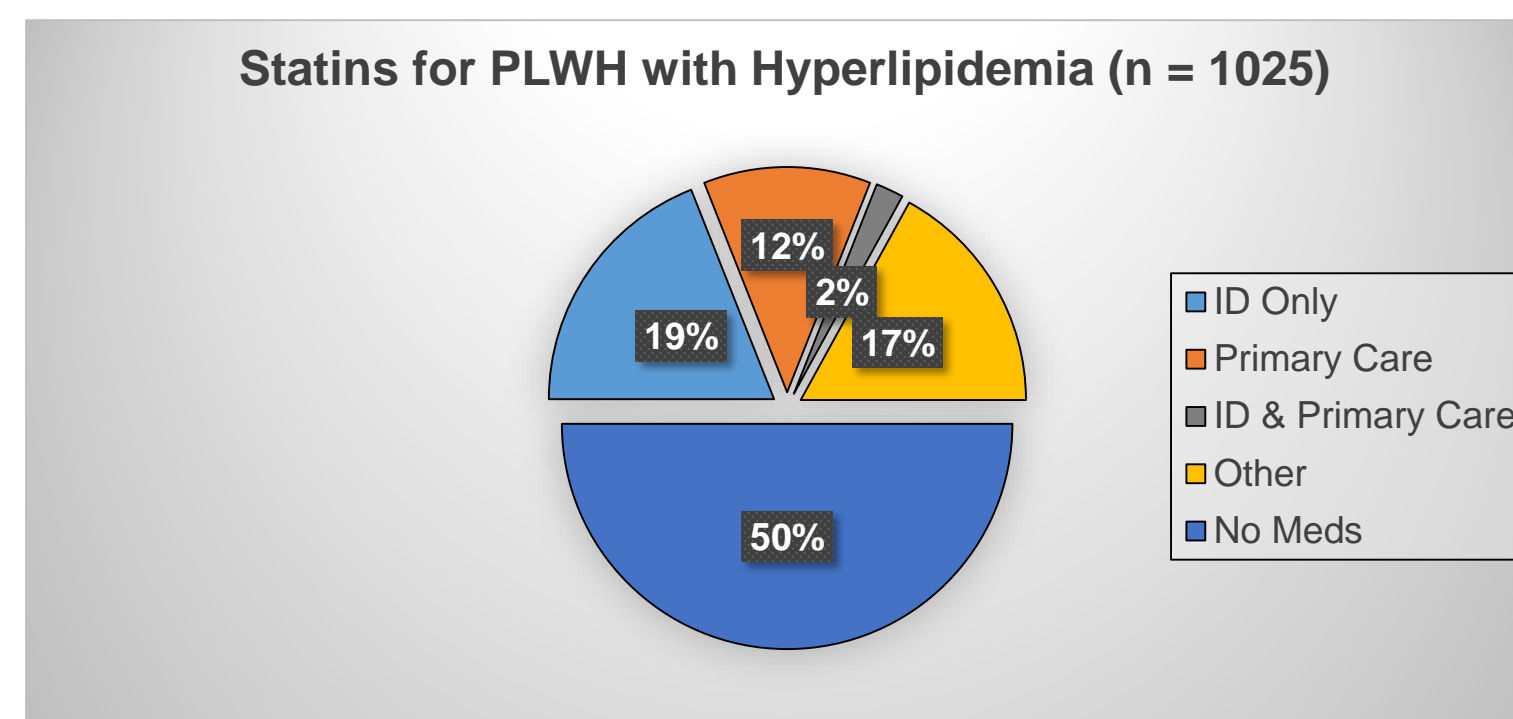
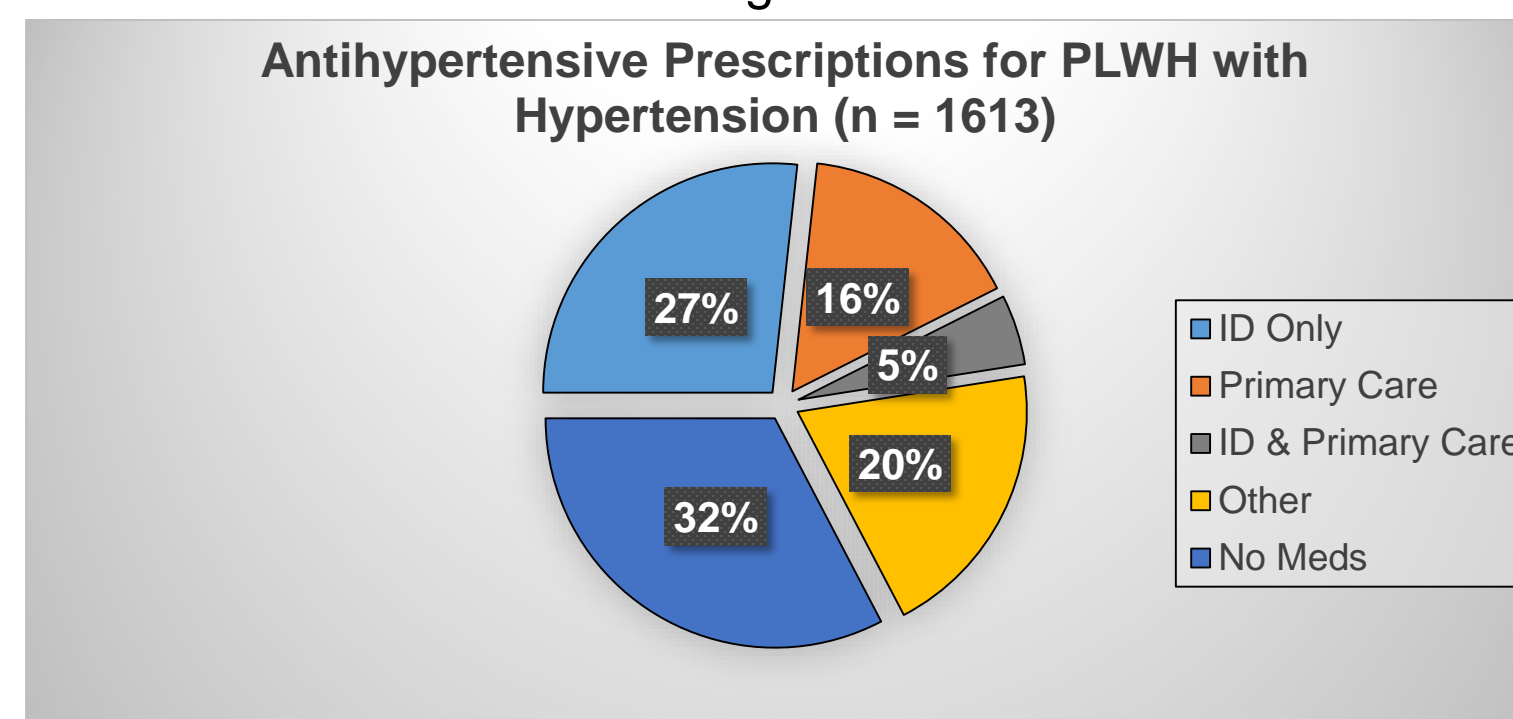
- PLWH who receive their ASCVD primary preventative care from the ID clinic would be less likely to meet evidence-based hypertension goals and experience less reduction in LDL-c cholesterol than other PLWH.

## Results

**Table 1. Study Population**

Characteristic	Number of Patients (%) (n = 1850)
Male	1217 (66)
Black	1193 (65)
Hispanic	58 (3)
Mean Age at Start of Observation (SD)	52.7 (7.7)
<b>Diagnosis</b>	
Hypertension only	825 (45)
Hyperlipidemia only	237 (13)
Hypertension and Hyperlipidemia	788 (43)
Diabetes	209 (11)
All Three Diagnoses	125 (7)
<b>CVD Events</b>	
Acute Coronary Syndrome	27
Coronary Intervention w/o ACS	10
Stroke	43
Peripheral Vascular Disease	25
Deaths	168 (9)

**Figure 1. Cardiovascular Medication Prescriptions by Clinic of Origination**

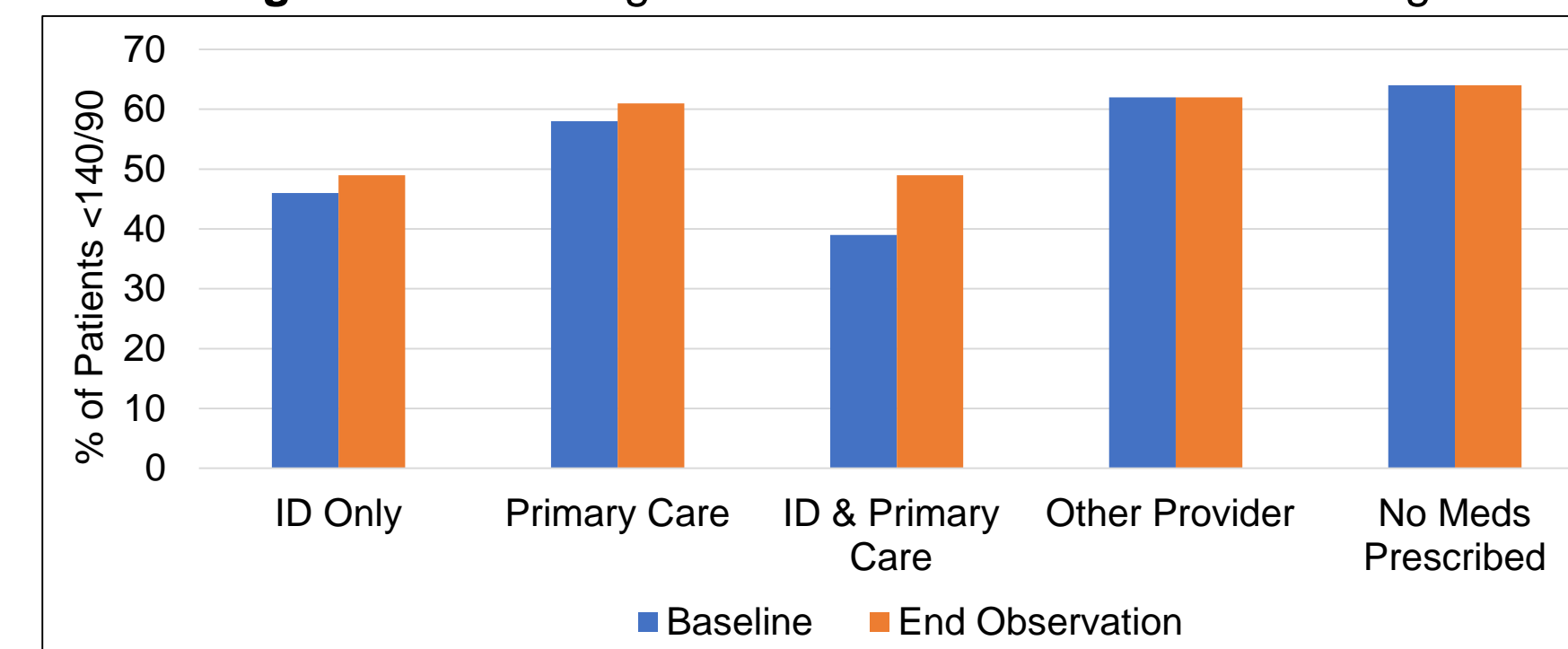


**Table 2. Blood Pressure Measurements by Prescribing Clinic among PLWH with HTN\***

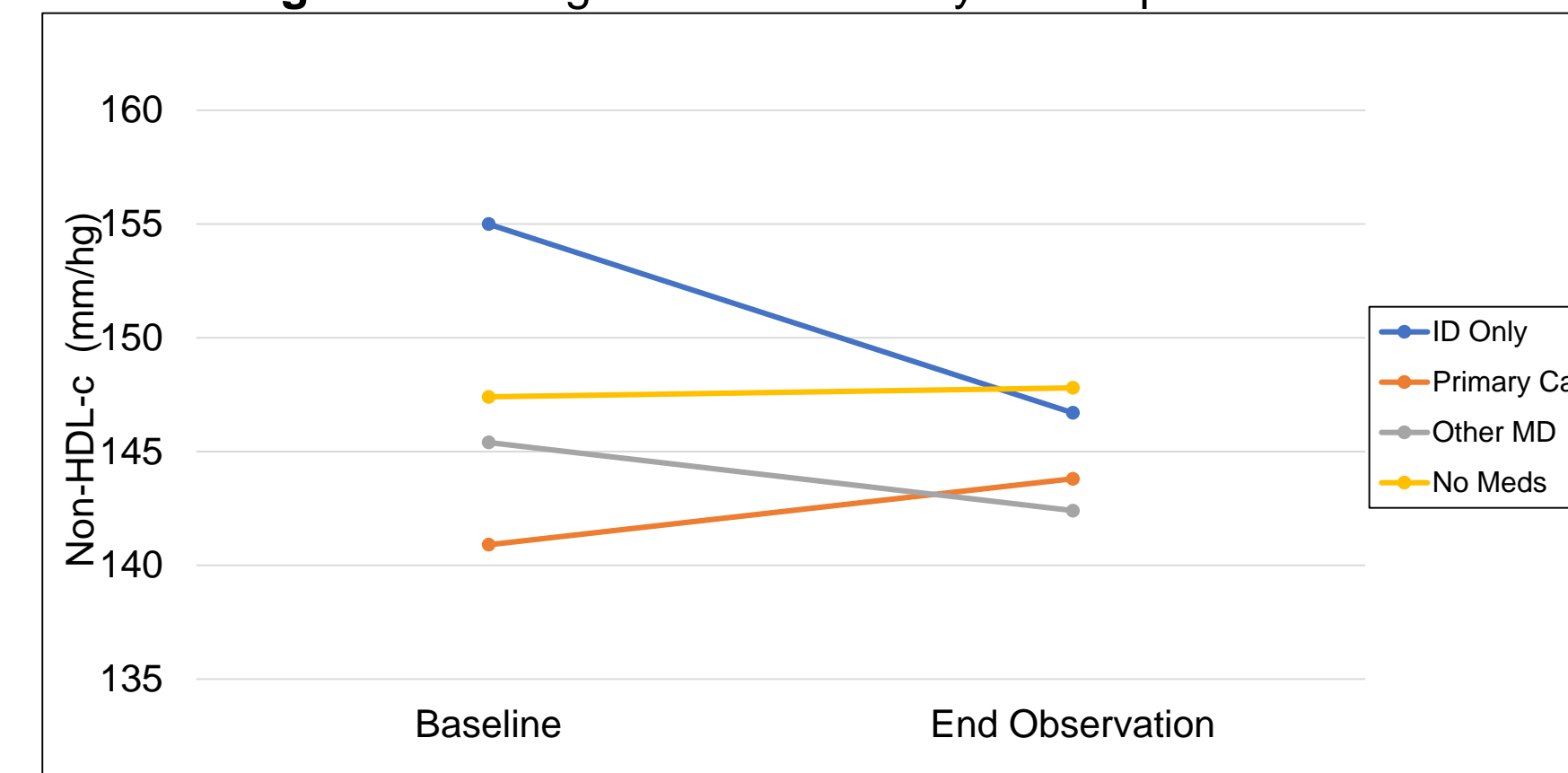
Characteristic	All Patients (n = 1296)	ID Only (n = 269)	PCP Only (n = 224)	Both (n = 49)	On meds entered by Other (n = 287)	No evidence of BP meds (n = 467)
<b>Start of Observation</b>						
Mean SBP (SD)	135.6 (19.5)	142.1 (21.1)	134.2 (18.7)	142.8 (22.5)	134.2 (19.8)	132.6 (17.5)
Mean DBP (SD)	79.8 (12.0)	82.9 (13.7)	79.1 (10.9)	84.7 (13.6)	79.3 (11.6)	78.1 (11.3)
<b>End of Observation</b>						
Mean SBP (SD)	134.5 (19.1)	139.2 (18.7)	132.5 (19.9)	139.8 (21.1)	133.9 (19.9)	132.4 (17.5)
Mean DBP (SD)	80.5 (12.3)	82.8 (12.8)	79.7 (11.4)	85.0 (12.2)	79.2 (12.6)	79.9 (12.0)
<b>Change in SBP over Observation Period</b>	-1.1	-2.9	-1.7	-3.0	-0.3	-0.2
<b>Change in DBP over Observation Period</b>	0.7	-0.1	0.6	0.3	-0.1	1.8

\*Duke and WF Data Only

**Figure 2. Percentage of Patients with BP <140/90mm Hg**



**Figure 3. Change in non-HDL-c by Prescription Provider**



**Table 3. Relative Risk for meeting JNC-8 Blood Pressure Goals (n = 1296)**

Variable	Unadjusted RR (95% CI)	Adjusted RR (95% CI)
Female	0.98 (0.85-1.15)	1.02 (0.92-1.13)
Black	0.90 (0.77-1.04)	<b>0.89 (0.81-0.99)</b>
Hispanic	0.98 (0.62-1.55)	0.96 (0.71-1.29)
Age (per 10 year increase)	1.01 (0.92-1.11)	1.00 (0.99-1.01)
Medicaid/Medicare	1.01 (0.87-1.17)	0.88 (0.55-1.40)
Self Pay	0.95 (0.76-1.18)	0.85 (0.53-1.35)
Antihypertensive Prescribed by ID Clinic	<b>0.79 (0.66-0.94)</b>	<b>0.80 (0.70-0.91)</b>

**Table 4. Relative Risk for meeting NLA non HDL-c Goals (n = 889)**

Variable	Unadjusted RR (95% CI)	Adjusted RR (95%CI)
Female	0.92 (0.72-1.16)	0.97 (0.75-1.24)
Black	0.97 (0.78-1.21)	1.02 (0.81-1.30)
Hispanic	1.16 (0.71-1.88)	1.56 (0.99-2.46)
Age (per 10 year increase)	<b>1.23 (1.08-1.40)</b>	<b>1.18 (1.04-1.35)</b>
Medicaid/Medicare	1.13 (0.91-1.40)	1.01 (0.22-1.53)
Self Pay	0.98 (0.73-1.32)	1.02 (0.68-1.51)
Statin Prescribed by ID Clinic	<b>0.72 (0.53-0.97)</b>	<b>0.75 (0.59-0.94)</b>

RR, relative risk; NLA, National Lipid Association

## Limitations

- Retrospective study without full ascertainment of other non ID/primary care physicians prescribing medications.
- Antiretroviral data were not available to study impact on lipid profiles.
- Data on individual providers were not available in the dataset.

## Conclusions

- Persons living with HIV who had anti-hypertensive and lipid-lowering medications prescribed primarily by ID specialty clinics were less likely to meet evidence-based goals for hypertension and hyperlipidemia.
- Future studies will look into the role of care fragmentation, lack of CVD-oriented decision support for HIV clinicians and clinical inertia as contributors to these observed disparities in outcomes.
- Clinic-based interventions designed to support ID clinicians committed to providing non-AIDS chronic disease care to their patients are needed.

## References

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