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Cardiovirology Clinic for Primary Prevention in HIV Patients: a Quality Improvement Assessment

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Cardiovirology Clinic for Primary Prevention in HIV Patients: a Quality Improvement Assessment

Jae G. Maeng

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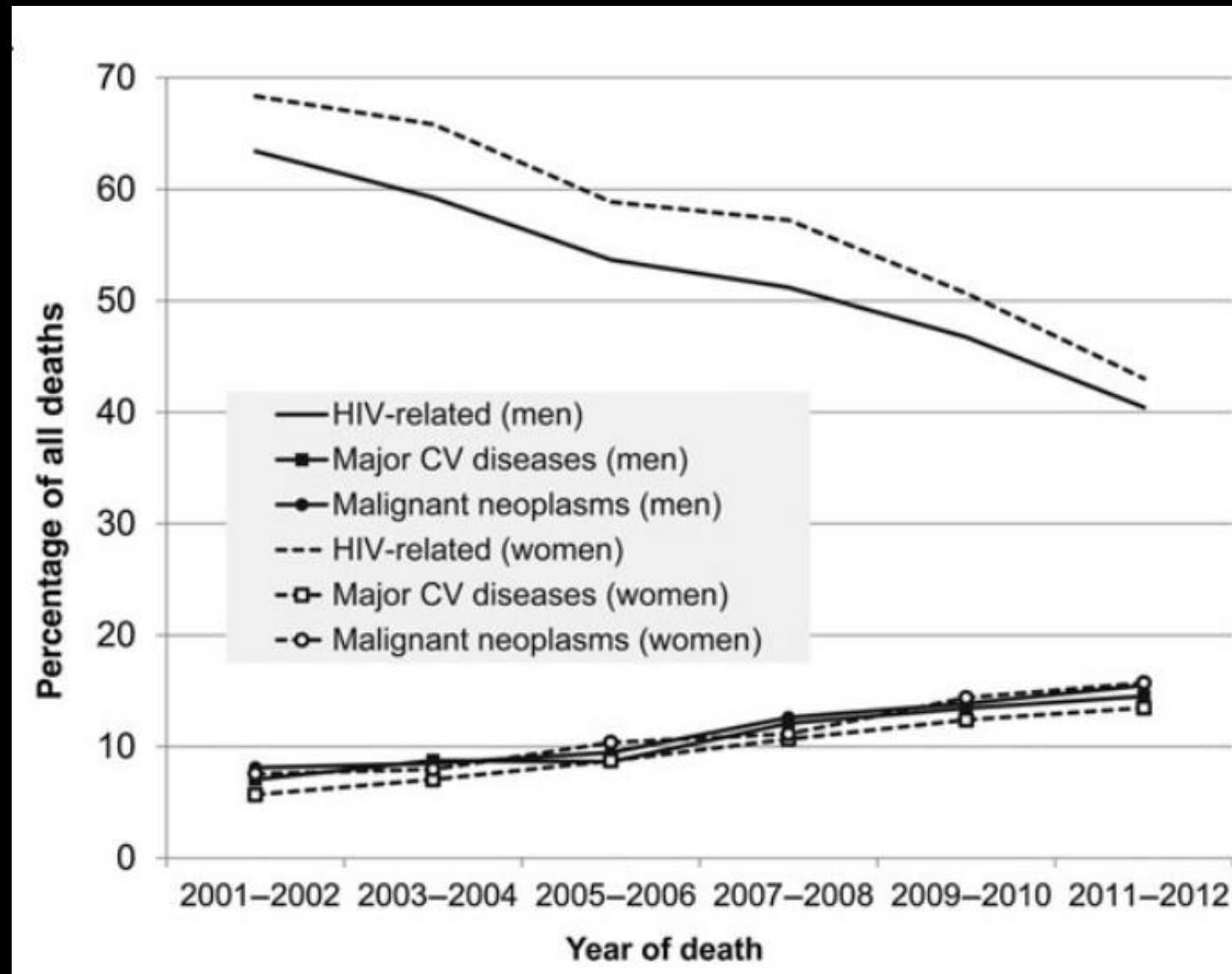
Quillen College of Medicine

Improving Life Expectancy of HIV Patients

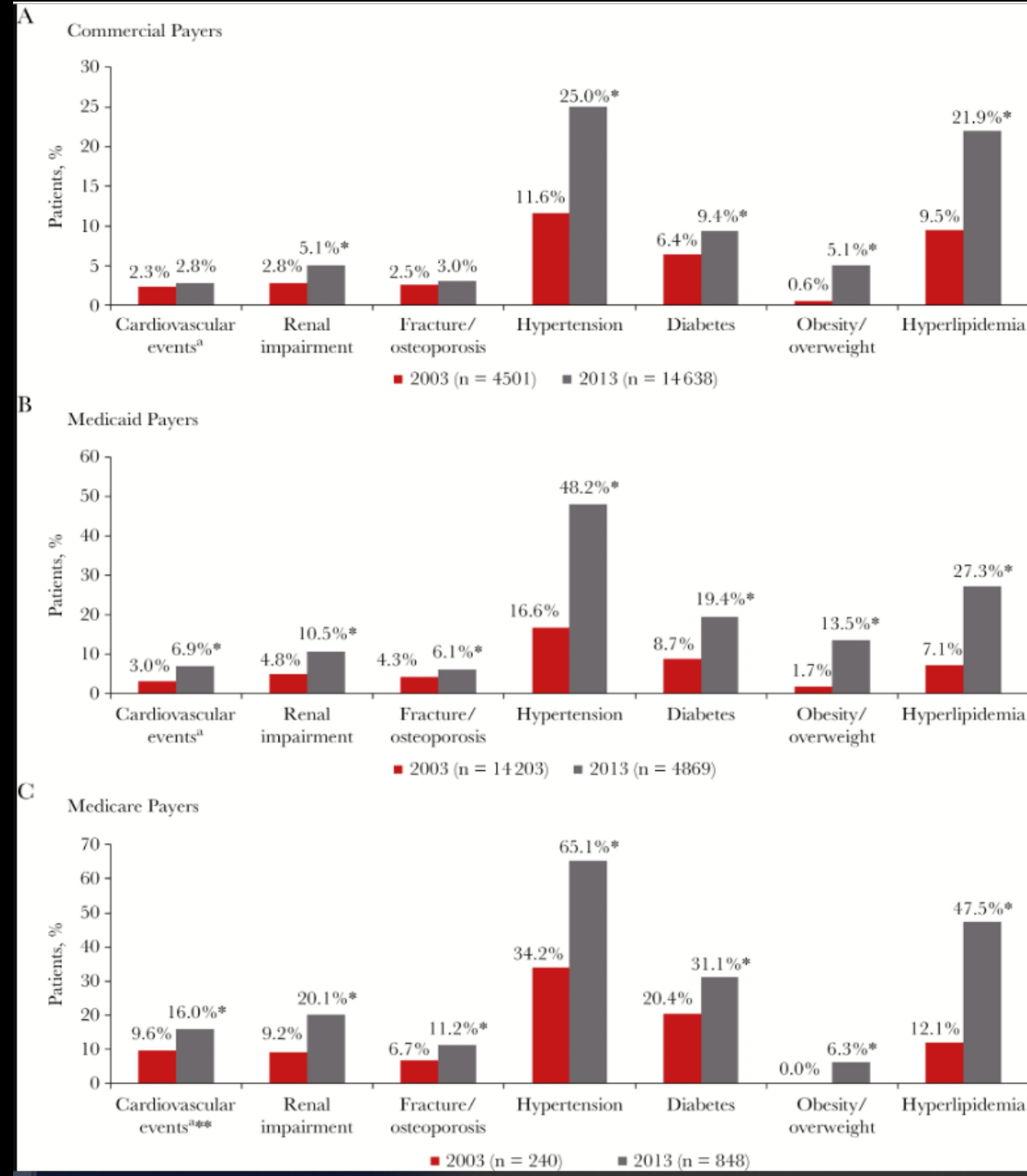


SOURCES: National Vital Statistics Reports, 2012; PLoS One, 2013; and Journal of the American Medical Association, 1993.

Increase in CV related mortality



Comorbidities in the U.S. HIV population



HIV and Relative Risk of ASCVD

- 50-100% higher risk of major adverse cardiovascular events (MACE)
 - Cardiovascular death
 - Non-fatal myocardial infarction
 - Non-fatal stroke
 - Need for major revascularization

Traditional Risk Factors for ASCVD

- Smoking
- Age
- Hypertension
- Dyslipidemia
- Family history of premature ASCVD
- Diabetes

Effect of smoking prevalence in developing ASCVD in HIV patients

	General Population	HIV Population
% of US adults who are current smokers	21%	46-76%
Increased risk in developing ASCVD	3 fold	4-5 fold

Smoking (frequency and impact) accounts for ~25% of higher attributable risk of MACE in patients living with HIV

Vascular Inflammation and ASCVD

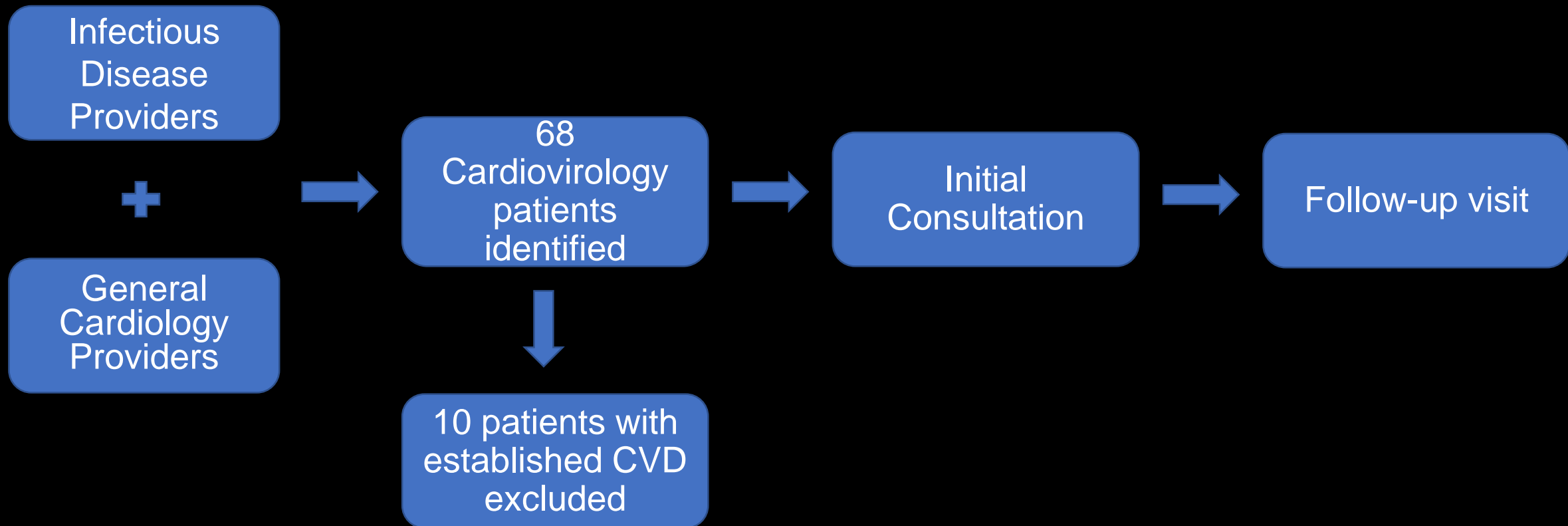
- Vascular inflammation increases ASCVD and event risk
- HIV causes chronic inflammation
- Inflammatory biomarkers: C-reactive protein, IL-6, TNF receptor II, endothelial activation marker

	Participants with CVD event	Participants without CVD event
C-Reactive Protein (hsCRP) (µg/mL)	3.34	1.67
Interleuken-6 (IL-6) (pg/mL)	3.07	1.72
D-Dimer (µg/mL)	0.31	0.20

Cardiovirology Clinic

- A senior ETSU Heart faculty cardiologist established a Cardiovirology clinic at the ETSU Center of Excellence for HIV/AIDS care in September 2017 to provide:
 - Primary prevention of major CV events in HIV population
 - Secondary prevention and disease management in HIV patients with established CVD
 - Aggressive intervention consistent with AHA/ACC guidelines and recent research
 - Coordination with PCP and HIV practitioners, pharmacists and other members of interdisciplinary team

Patient Identification



Methods -1

D:A:D 5-year risk score (reduced model) calculated at initial consult and most recent visits. Data elements include:

- Age
- Sex
- Present or past smoking history
- History of premature ASCVD in first degree relatives
 - (<55 yo male, <65 yo female)
- Diabetes
- CD4 cell count
- Systolic BP
- Total Cholesterol
- HDL Cholesterol

Welcome to the Risk Assessment Tool System (RATS). Please select the desired values from the list below.

General

- EuroSida AIDS/Death risk score
- FENCE score

Cardiovascular

- D:A:D (R) CVD 5 and 10 year risk score
- D:A:D (F) CVD 5 and 10 year risk score
- Framingham CVD 5 and 10 year risk score
- MI Number needed to harm

Kidney

- Estimated glomerular filtration rate
- Short chronic kidney disease risk score
- Full chronic kidney disease risk score

Build form

Please fill out the following form consisting of 10 items.

1. Age: yr ▾

2. Gender: Male Female

3. Previous smoker? Yes No

4. Smoker? Yes No

5. Family CVD history? Yes No

6. Diabetes? Yes No

7. CD4 cell count: Cells/ μ L ▾

8. Systolic blood pressure: mmHg ▾

9. Total cholesterol: mg/dL ▾

10. HDL: mg/dL ▾

Calculate results

Reset form

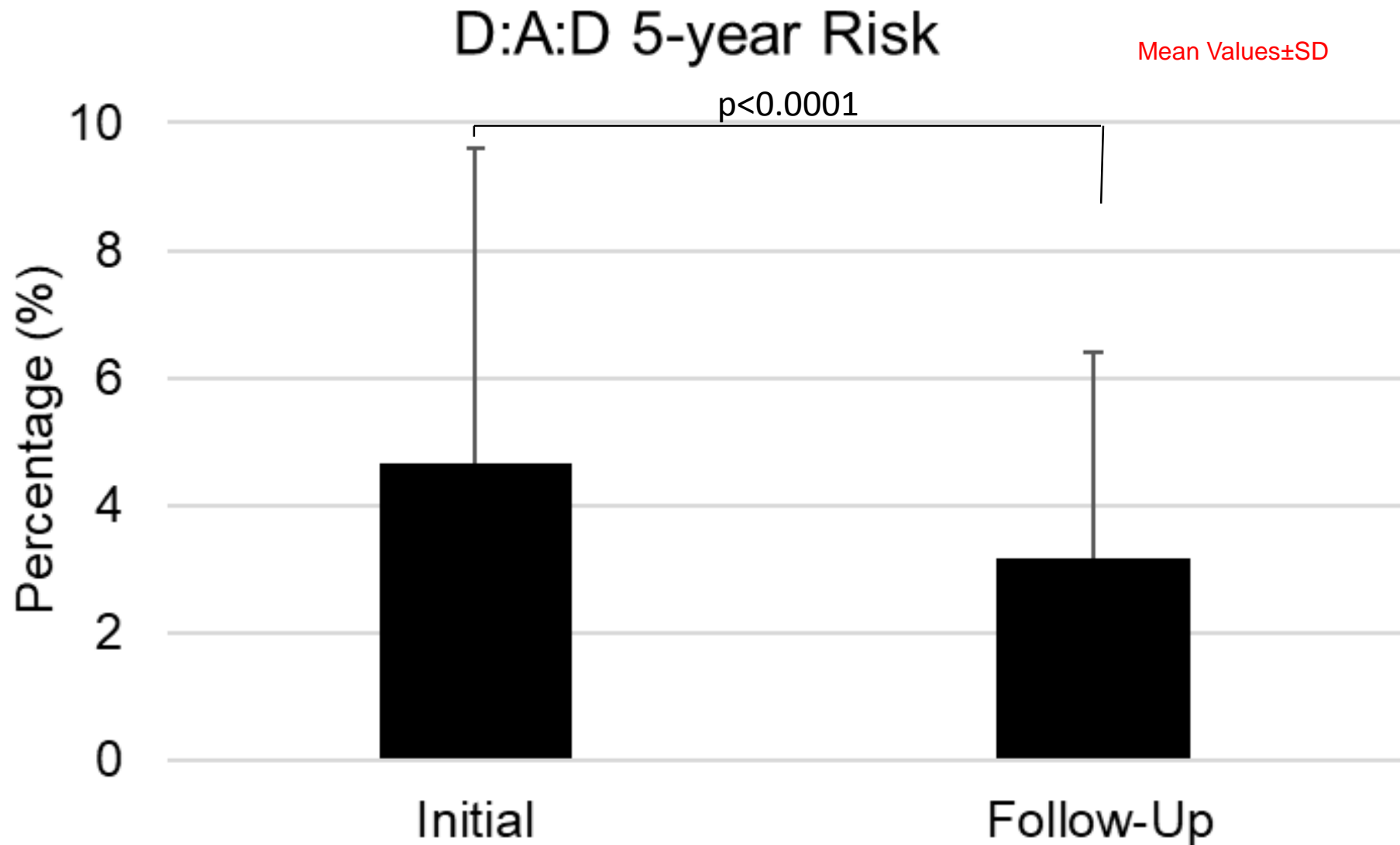
Methods -2

- Additional Data collected:
 - Personal History of ASCVD
 - Body-mass index and systolic (SBP) and diastolic (DBP) blood pressures
 - Laboratory Values
 - CD₄ count
 - HIV-1 viral load
 - Proteinuria
 - Estimated glomerular filtration rate
 - Triglycerides (TG)
 - Low Density Lipoprotein cholesterol (LDL)

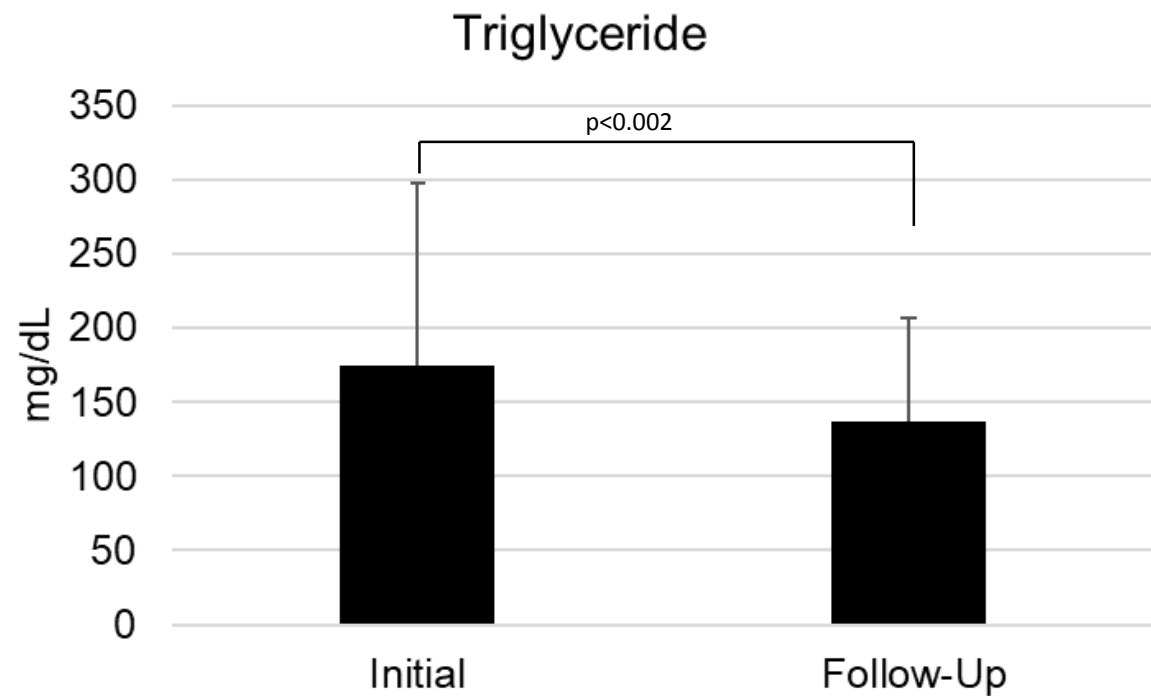
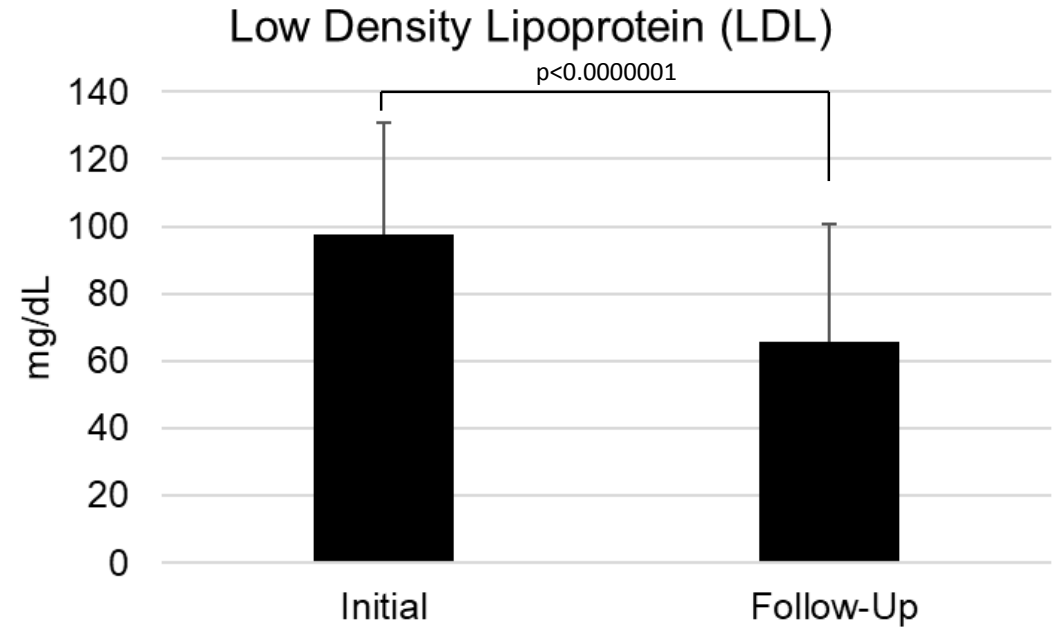
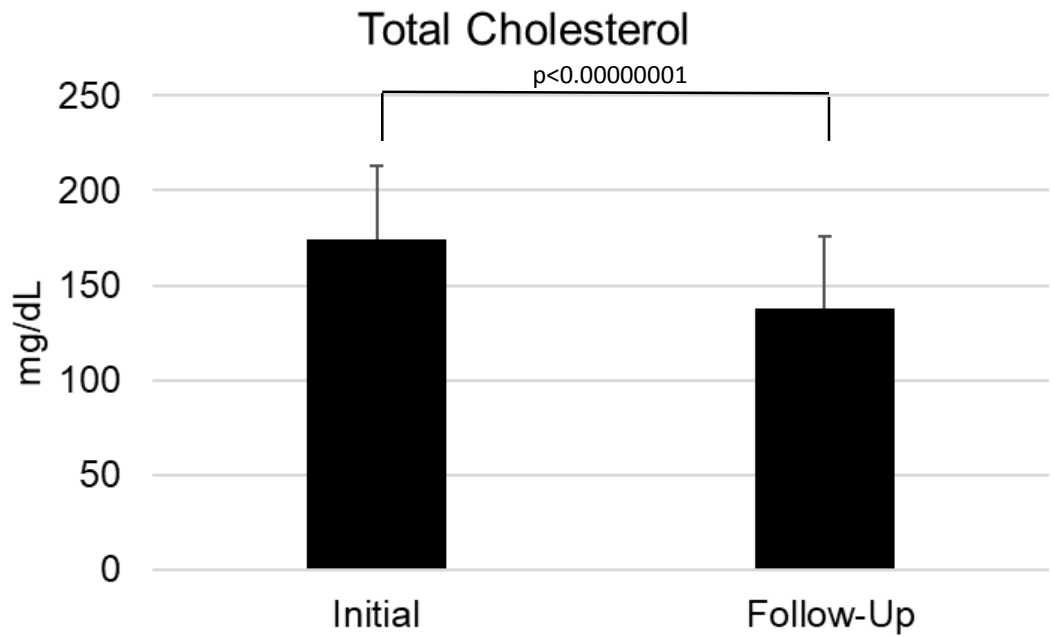
Analysis

- Univariate analysis
- Two-tailed, paired T-testing to identify significant differences in mean parameter values (initial vs. most recent visits)
- Significance: $p < 0.05$

Primary Findings

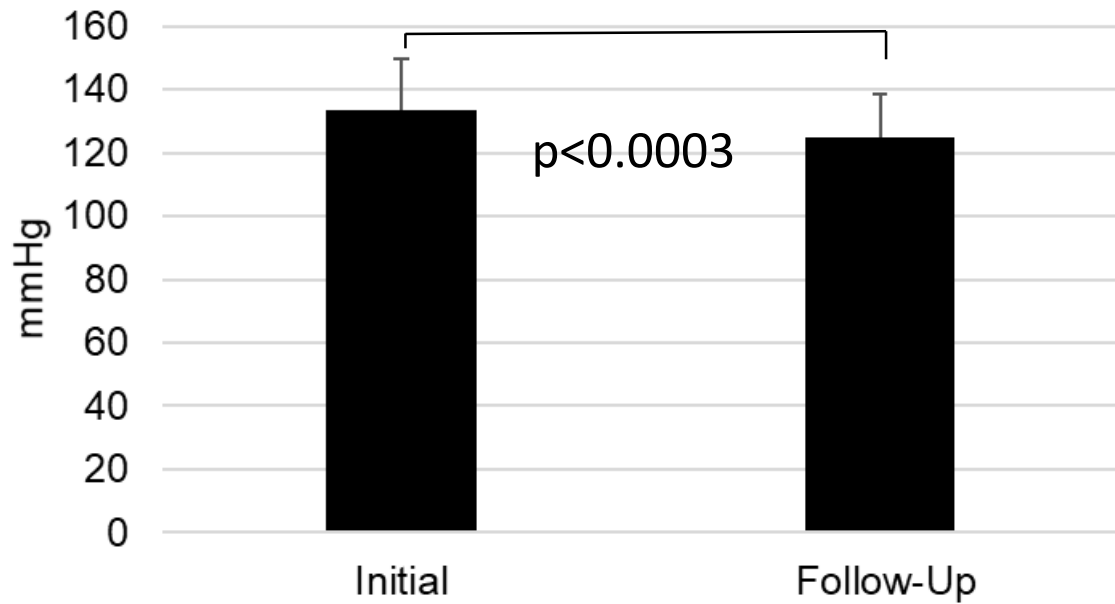


Secondary Findings: Lipids

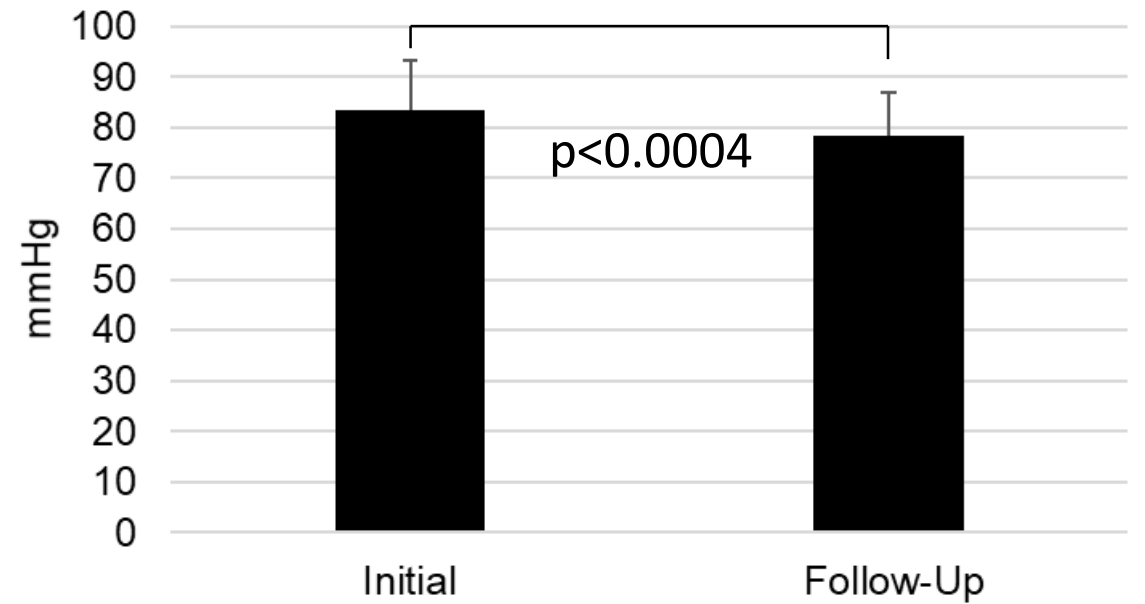


Secondary Findings: Blood Pressure

Systolic Blood Pressure



Diastolic Blood Pressure



Conclusion

- Patients living with HIV who received primary preventive cardiovascular care in the ETSU Cardiovirology Clinic enjoyed meaningful reductions in their D:A:D 5-yr MACE risk score
- Significant reductions seen in: TG, TC, LDL, SBP, DBP
 - Blood pressure and lipid interventions likely influenced risk reduction
 - Aggressive control may be most important in these well-controlled HIV patients
- Findings suggest the potential efficacy of the Cardiovirology Clinic model

Limitations

- Too few data points due to:
 - Short duration of follow up (<1 year)
 - Small patient population (n=58)
- D:A:D risk score surrogate for clinical outcomes
 - All CV risk estimation equations have inherent inaccuracies
- Other risk factor modifications may have been identified as effective with larger patient population and longer follow-up.