

Antihypertensive Medication Adherence and Blood Pressure Control Among Central Alabama Veterans

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Medication Adherence

- **Adherence: taking medication as prescribed**
- **One in four prescriptions never filled**
- **Half of patients discontinue antihypertensives within 1 year**
- **Nonadherence more likely for chronic, asymptomatic conditions**



Adherence and Outcomes

Medication adherence associated with:

- Better blood pressure control
- Fewer emergency visits
- Decreased hospitalization rates
- Lower mortality
- Lower health care costs



Costs

- **1/3–2/3 of all medication-related hospital admissions from poor adherence**
- **Costs \$100 billion per year**
- **Adherence lowers annual medical costs by \$4,337 per patient with hypertension**
 - **Cost-benefit ratio 1:10**



Hypertension

- **Estimated 30% of U.S. adults have hypertension**
 - 66.9 million people
- **47% with hypertension have blood pressure (BP) controlled**
- **Among those taking any antihypertensive, 60% controlled**
- **Even modest elevation of BP increases risk for heart disease and stroke**



Gu Q, Burt VL, Dillon CF, Yoon S. Trends in antihypertensive medication use and blood pressure control among United States adults with hypertension: the National Health and Nutrition Examination Survey, 2001 to 2010. *Circulation*. 2012;126(17):2105-14.

Vital Signs: Awareness and Treatment of Uncontrolled Hypertension Among Adults — United States, 2003–2010. *MMWR*. 2012;61(35):703–708

Data Review

- Describe among Central Alabama veterans:
 - Antihypertensive medication dispensed
 - Medication adherence
 - BP control
- Assess relationship between adherence and BP control



Methods

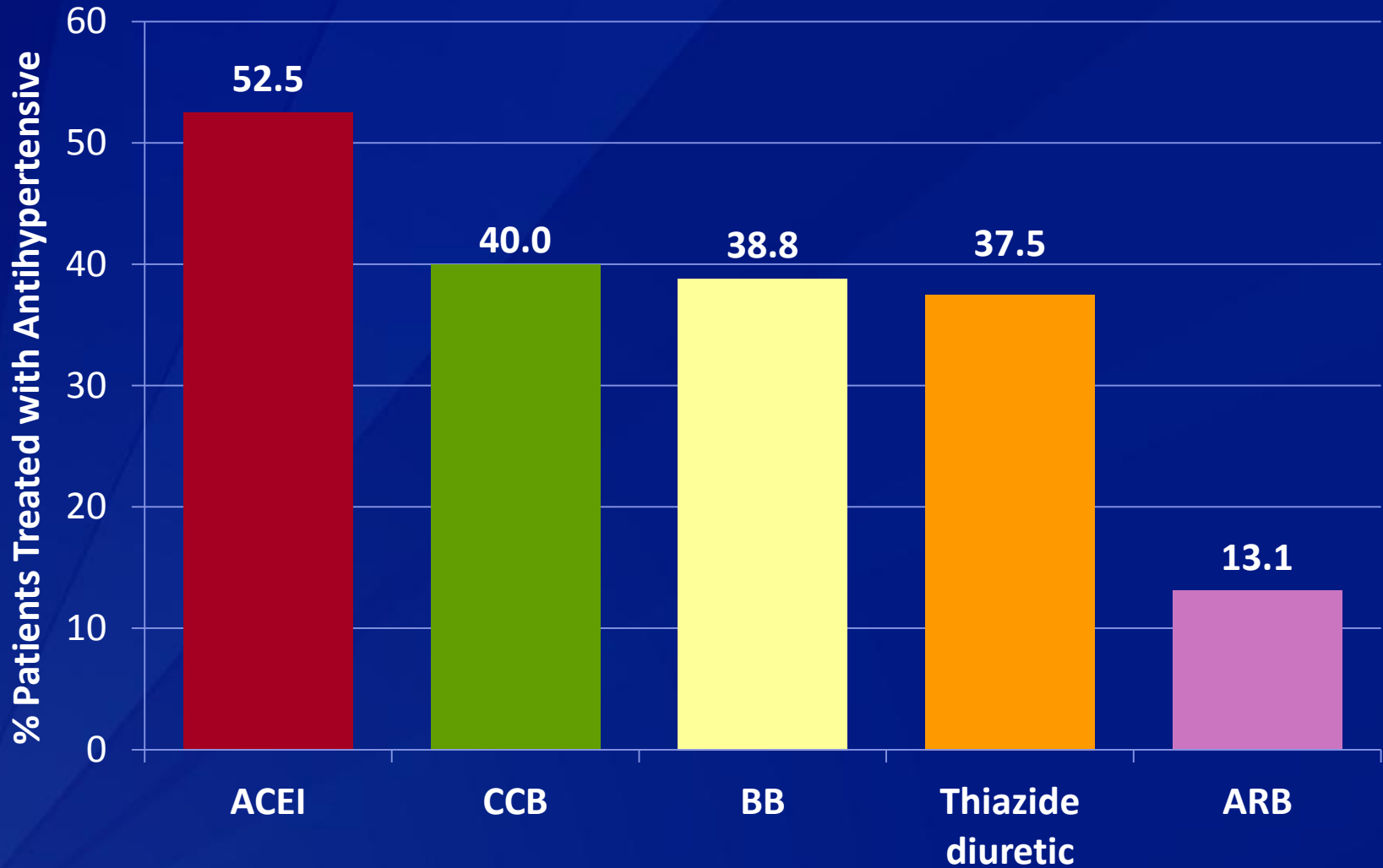
- **Central Alabama Veterans Health Care System (CAVHCS) electronic health record data during fiscal year 2015**
- **Patients prescribed at least one antihypertensive:**
 - Beta blockers (BB)
 - Calcium channel blockers (CCB)
 - Thiazide diuretics
 - Angiotensin receptor blockers (ARB)
 - Angiotensin converting enzyme inhibitors (ACEI)
 - Fixed combinations of above
- **Adherence: $\geq 80\%$ days covered by antihypertensive**
- **BP control: $< 140/90$**
- **Also collected age and calculated body mass index**

Results

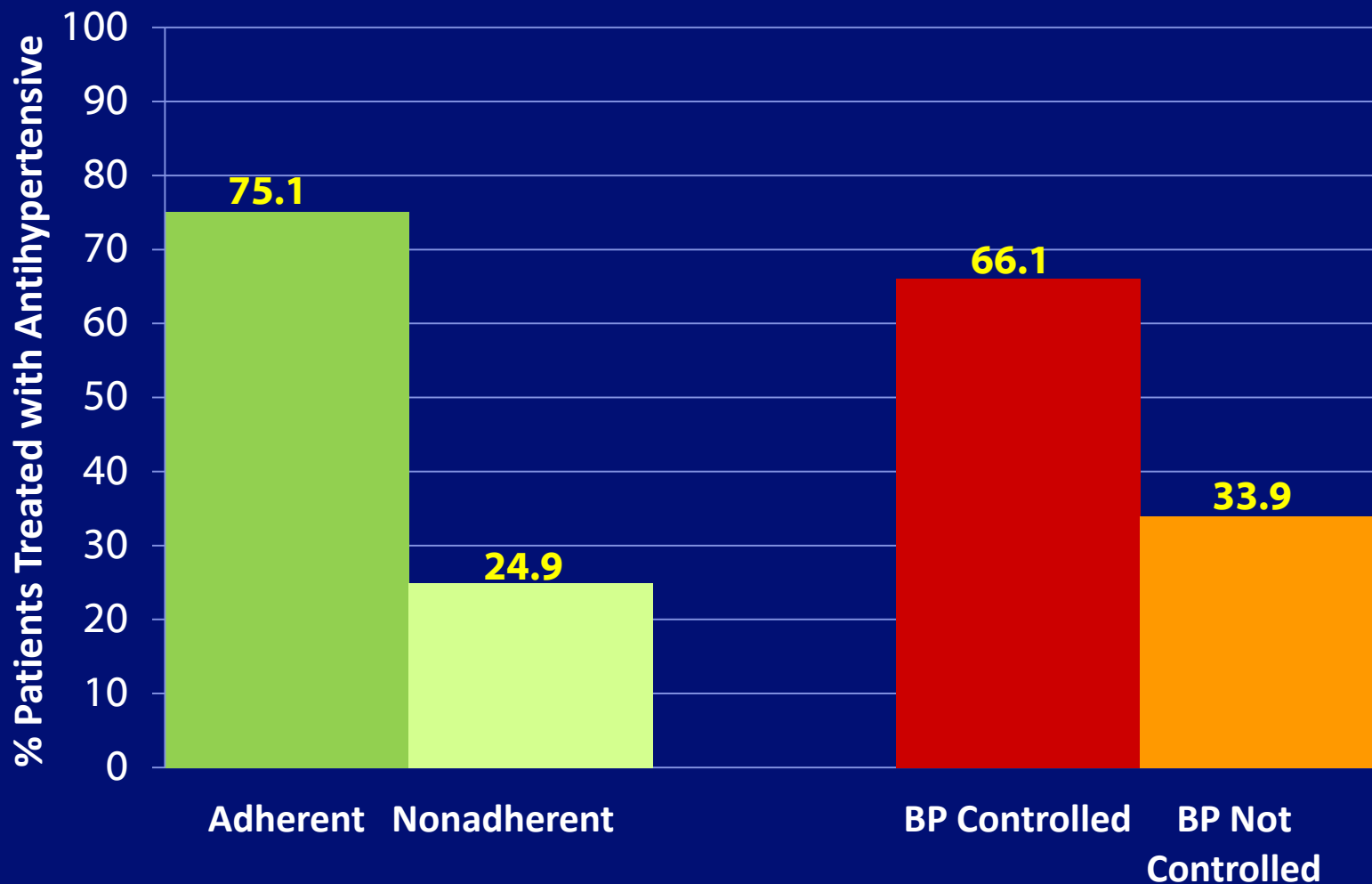
- **33 antihypertensives dispensed**
- **79,178 prescription fills**
- **17,889 patients**
- **Mean 1.8 antihypertensive medication classes per patient by 4.4 fills during year with mean 83.5 days supply each**
- **Antihypertensive classes:**
 - 45.2% patients received one class
 - 35.4% two classes
 - 16.0% three classes
 - 3.5% ≥ 4 classes



Antihypertensive Medication Classes Dispensed — Central Alabama Veterans Health Care System, FY 2015



Adherence and Blood Pressure Control— Central Alabama Veterans Health Care System, FY 2015



Blood Pressure by Adherence Status

Characteristics	Adherent	Non-adherent	P-value
Systolic blood pressure, mean mmHg (range)	133.2 (80–215)	135.0 (81–229)	<0.001
Diastolic blood pressure, mean mmHg (range)	77.9 (42–132)	79.7 (41–125)	<0.001
Blood pressure controlled, %	67.4	62.0	<0.001

Adherent patients 9% more likely to have BP controlled compared with nonadherent patients

- Relative risk **1.09**
- 95% confidence interval: 1.06–1.12

Blood Pressure Control

Characteristics	BP Controlled	BP Not Controlled	P-value
Systolic blood pressure, mean mmHg (range)	124.8 (80–139)	150.9 (111–229)	<0.001
Diastolic blood pressure, mean mmHg (range)	75.3 (41–89)	84.3 (49–132)	<0.001
Adherent to antihypertensive medication, %	78.0	73.6	<0.001

Multivariable Logistic Regression Model for BP Control

Factor	Adjusted Odds	95% CI	P-value
Adherent to medication	1.33	1.22–1.44	<0.001
Age	1.00	0.997–1.003	0.85
Body mass index	1.01	1.00–1.02	0.002
Number of antihypertensive medication fills	1.04	1.02–1.05	<0.001
Number of antihypertensive drug classes	0.71	0.67–0.76	<0.001



Summary

- **3/4 adherent to antihypertensive regimen**
- **2/3 with BP controlled**
- **Adherent patients 33% more likely to have BP controlled**
- **Those without BP control also highly adherent**



Next Steps

- CAVHCS initiated pilot program of patient education
- Multidisciplinary group sessions
- One-on-one counseling by pharmacist



Limitations

- **Veteran facility limits generalizability**
 - Minimal copayment
 - Mail order available
- **Medication fills serve as proxy for medication consumption**
- **Discontinuation or switch to nonincluded med not captured**
- **Antihypertensive medication prescribed for other reason**
- **Patient relocation or use of other sources underestimates adherence**
- **Other factors not considered**
 - Comorbid conditions, illness severity, substance use, SES, etc.

Recommendations for Clinic Practices

- **Simplify medication regimens**
- **Facilitate refills**
- **Recognize and manage inadequate BP control**
- **Offer open access to complimentary BP checks**
- **Adopt BP treatment algorithm**



Recommendations for Clinic Interventions

- Institute team-based care
- Consider nurse-managed patient education, coaching, and telephone support of home BP monitoring
- Explore pharmacist-led counseling and medication management



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Thank you!

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