Research Opportunities to Improve Hypertension Control

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Limitations with many health services studies in hypertension

- Small sample sizes (low power or limited generalizability)
- Single site and single intervention pharmacist or nurse
- Bias in BP measurement
- Lack of control groups (pre- post- design only)
- No evaluation of key covariates
- Few were intention-to-treat analyses
- Did not adequately evaluate missing data (last value carried forward versus more sophisticated modeling or sensitivity analysis).

Carter BL, Bosworth HB, Green BB. State of the Art Review: The Hypertension Team: The role of the pharmacist, nurse and teamwork in hypertension therapy. J Clin Hypertens 2012;14:51-65

Meta-Analysis: Potency of individual components of team-based care	
	Median reduction in SBP(mm Hg)
Pharmacist recommended medication to physician	**-9.3***
Education on BP medications	**-8.75***
Pharmacist did the intervention	**-8.44**
Assessed medication compliance	**-7.9**
Counseling on lifestyle modification	**-7.59**
Nurse did the intervention	**-4.8***

*- statistically significant

Carter BL, Rogers M, Daly J, Zheng S, James JA. Quality Improvement Strategies for Hypertension: The Potency of Team-based Care Interventions. Archives of Internal Medicine 2009; 169:1748-1755.

Meta-analysis of Potency of individual components of team-based care	
	Odds that BP was controlled (95% confidence Interval)
Studies involving nurses	**1.69 (1.48-1.93)** **[69% increased chance]**
Studies involving pharmacists within physician offices or clinics	**2.48 (2.05-2.99)** **[148% increased chance]**

Conclusion: All were effective but interventions by pharmacists appear to be more potent than by nurses.

Carter BL, et al. Archives of Internal Medicine 2009; 169:1748-1755.

Collaboration Among Pharmacists and Physicians To Improve Outcomes Now (CAPTION)

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Collaboration Among Pharmacists and Physicians To Improve Outcomes Now

Physician/Pharmacist Collaborative Management

CAPTION
(including 2 offices in Madison, 1 in Racine)

- 32 primary care offices randomized to evaluate a physician-pharmacist collaborative intervention
- Secondary aims addressed:
  1. What happens when the intervention is stopped?
  2. Can the intervention be sustained for 2 years?
  3. Does the intervention benefit patients from minority groups?

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Collaboration Among Pharmacists and Physicians To Improve Outcomes Now

Blood pressure- 9 Months

Variable	Intervention Groups (N = 401)	Control Group (N = 224)	Model-Adjusted Difference – Intervention vs. Control (95% CI)	p-value
SBP Mean (SD)	131.6 (15.8)	138.2 (19.7)	-6.07 (-9.64, -2.50)	0.001
DBP Mean (SD)	76.3 (11.1)	78.0 (14.5)	-2.89 (-4.80, -0.99)	0.003

Carter et al. Circulation: Cardiovascular Quality and Outcomes. 2015; 8:235-243.

Results – Minority subjects

Variable	Intervention Groups (N = 226)	Control Group (N = 111)	Model Adjusted Difference – Intervention vs. Control (95% CI)	p-value
SBP Mean (SD)	133.0 (16.3)	140.3 (21.4)	-6.42 (-10.97, -1.87)	0.006
DBP Mean (SD)	77.9 (10.7)	78.8 (15.9)	-2.98 (-5.76, -0.20)	0.036

Carter et al. Circulation: Cardiovascular Quality and Outcomes. 2015; 8:235-243.

How would the new 2014 Guidelines have changed the CAPTION results?

Intervention BP Control	Usual Care BP Control	OR (95% CI)	p-value
61%	**45%**	2.03 (1.29, 3.22)	**0.003**

NOTE: These subjects likely were the minority who did not have BP control in the office before the study, but, can we do better in these patients???

Carter et al. Circulation: Cardiovascular Quality and Outcomes. 2015; 8:235-243.

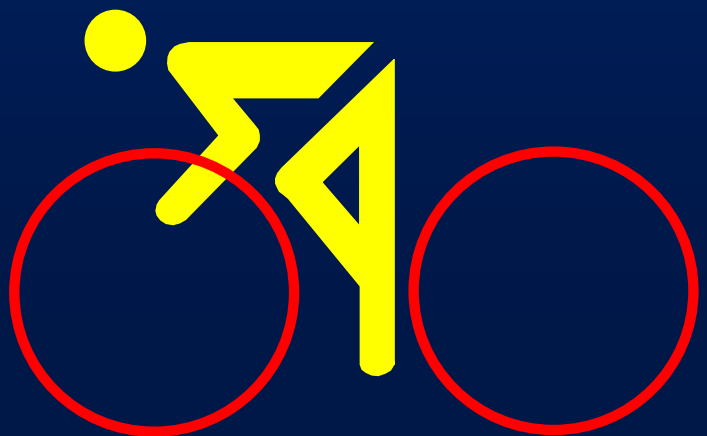
Some Research Opportunities

- Reliability of office or EMR BP data for research:
  - 402/1053 (38%) consented CAPTION subjects were excluded due to BP control despite not controlled in EMR.
  - Timing of BP measurements in EMR may not be useful.
- Home vs. Office vs. 24 hour Ambulatory Monitoring

Some Research Opportunities

- Most efficient utilization of multiple team members (nurses, pharmacists, others) to achieve high BP control rates (include cost-effectiveness analyses).
- Strategies to overcome socioeconomic, demographic and cultural barriers to good BP control.
- Assessment of new medication adherence tools to measure and/or improve adherence:
  - Electronic devices
  - Therapeutic drug monitoring of drug levels

Comments and Questions



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